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Giving all children a good start to school: a protocol in defining occupational therapist's role in school readiness, specifically in the SMART program

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Giving All Children a Good Start to School:
A Protocol in Defining Occupational Therapist’s Role in School Readiness,
Specifically in the SMART Program

by

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A Scholarly Project
Submitted to the Occupational Therapy Department
of the
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This Scholarly Project Paper, submitted by Melissa Boll, OTR in partial fulfillment of the requirement for the Degree of Master’s of Occupational Therapy from the University of North Dakota, has been read by the faculty Advisor under whom the work has been done and is hereby approved.

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Department: Occupational Therapy

Degree: Master’s of Occupational Therapy

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ABSTRACT

More children are entering school “not ready.” Current research is showing that many “healthy” children are entering school not developmentally ready for formal learning. Based my own experiences working as a school occupational therapist for the past four years in rural area schools, this new trend is becoming more apparent. Teachers and other school professionals have increasing concerns over the numbers of children that seem “clumsy” or “awkward” compared to their peers. Children are expected to learn more than ever before upon entering school, the curriculum is no longer age-appropriate due to the pushing down of academics. Upon entrance to kindergarten, these children struggle to perform school tasks asked of them and the concern is if the readiness gaps are not addressed early on that these children will struggle even more in later years.

It has been found through the literature and from personal experience that children in Title I schools are particularly vulnerable to lack readiness because of cultural, environmental, and/or economic deprivation. A current study by the Minnesota Department of Education in 2004, found that 28% of 4,000 children assessed in Minnesota kindergartens performed skills at a level that made them “not ready” for academic learning in kindergarten.

In response to these concerns and findings, a program that has caught the attention of many educators and school occupational therapists is the SMART (Stimulating Maturity through Accelerated Readiness Training) Program. This
program is being used in many Minnesota schools in order to close school readiness
gaps and give children a good start to school and future school success. The program
so closely parallels the role of school occupational therapists that many have become
very involved in the program.

The purpose of this project was to closely examine the SMART program and
to determine how occupational therapists can help implement and promote the use of
this program. The product of this project was the development of a protocol,
consisting of 10 modules, that occupational therapists can use to facilitate
involvement in and promotion of the SMART Program to help address school
readiness issues.
CHAPTER ONE

INTRODUCTION

Based on my experiences as an occupational therapist in a school setting for the past four years and discussions with the teachers and other professionals who work in this setting, there is growing concern about what is expected from young children as they enter school. Kindergartners are expected to perform to high standards, and more and more children are entering school not ready for the high expectations of formal learning. In part, this trend is a result of continual criticism of the American Education system, a result of the Back to Basics movement, in part as a function of the intervention programs and their evaluation of the 1960’s and 1970’s, and the elementary curriculum being “pushed down” (Bowman & Wallace, 1994).

According to Howes (1989), we have come to believe that “earlier is better.” Preschoolers are taught the old content of kindergarten and first grade. Kindergartners are expected to read and do math much as we used to expect first and second graders to do. Age and developmentally appropriate curriculum is also being replaced by more academics and formal learning, which is adding to children demonstrating poor skills needed to succeed in school.

Maxwell and Clifford (2004) write, “Improving education continues to be the current political platform” (p.42). Every politician, teacher, and parent want young children to succeed in school. The result is that teachers are under increased pressure to
focus on standards and improve test scores. More and more teachers are discouraged, if not downright prevented from teaching using “fun” activities. They are admonished to get busy diagnosing and remediating reading inadequacies, practicing test-taking techniques, and drilling computation skills because these activities can raise test scores the fastest. Teachers are no longer encouraged to teach their passions, and are no longer encouraged to consider what would be most beneficial to a child’s long-range development. “The sad result is that teaching and learning are not as enjoyable as they used to be” (p.42).

Statement of the Problem

The results of the Year Three: Minnesota School Readiness Study by the Minnesota Department of Education (MDE), in the Fall of 2004, confirms that children come to kindergarten with variability in their skills, knowledge, behaviors, and accomplishments. Some of this may be due to the following factors: the lack of opportunities some children are given to express their capabilities, children growing up below the official poverty line, parental factors, and what is being expected of them upon entrance to school. The study states, “Although much can be done during the child’s early years to enhance the child’s skills, knowledge, behaviors, and accomplishments, variability in children’s skills is normal for children entering kindergarten; schools need to be prepared to address this variability” (MDE, 2004, pp. 52-59).

This academic acceleration and pressure on our children is a growing concern of parents, educators, school administrators, and health professionals. Children are often judged “not ready” for school and kept out of school for a year; some states have even initiated entrance examinations for kindergarten. More and more children who do enter
school at the official chronological age of 6 are failing in their early years of school. Kindergarten retentions, and so-called junior or transitional kindergartens or first grades, are also increasing due to accelerated learning pressures (Byrd & Weitzman, 1994).

Developmental researchers such as Swiss Theorist Jean Piaget note that young children learn best through imitating play and through age-appropriate activities (Piaget, 1981). Other developmental researchers such as Byrd and Weitzman (1994), state “A child learns best through hands-on manipulation of materials within a rich and stimulating environment” (p. 550), and Marr, Cermak, Cohn, and Henderson (2003), state, “That a children’s learning is enhanced when they are engaged in interactive processes and have healthy stimulating environments to grow in” (p. 551). Byrd and Weitzman (1994) go on to show that the bulk of educational theory and developmental research strongly suggests that development occurs only as a result of the interaction between the child and the environment. “Because this is not always the case, educators, health professionals, and administrators are seeing more and more children not only struggle in the classroom, they are seeing and attributing it to children entering school “not ready” for school or entering with gaps in school readiness skills” (Marr et al., 2003, p. 551).

In their study, Marr et al. note that the National Association for the Education of Young Children (NAEYC) states that “School readiness has been defined as a process of acquiring the foundational skills needed to learn new activities” by Slavin, Karweit, and Wasik in Marr et al. (2003, p. 551). Marr et al. also write, “traditionally, school readiness refers to specific skills acquired by children before entering kindergarten” (p. 551). The authors note that “the NAEYC rejects this definition of school readiness as it
is based on an assumption that there is a predetermined set of skills children need before entering school (NAEYC, 1990, 1995)” (p.551). According to the NAEYC, in Marr et al., “school readiness is considered a fluid process and is not meant to be used as a threshold criterion for the preschooler’s admission into kindergarten” (p. 551). NAEYC holds the position that development and learning is multidimensional and can be influenced by individual characteristics and the environment of the child. The Technical Planning group of the National Education Goals Panel (1993, pp. 2-3), “suggested that early development and learning embrace five dimensions: (1) physical well-being and motor development; (2) social and emotional development; (3) approaches toward learning; (4) language development; and (5) cognition and general knowledge.” Physical well-being acknowledges the link between low birth-weight and poor nutrition on readiness for school, and motor development includes both large and small muscle development. Social and emotional well-being is based on emotional support and positive relationships which help the young child develop self-confidence. The approach to learning dimension acknowledges that all children do not learn the same and teachers need to understand this. Language development and cognition and general knowledge are foundational to communication, interactions with peers and adults, and learning. “Children’s transitions to formal schooling are eased when children have been provided with a variety of play-oriented, exploratory activities, and when their early school experiences continue these activities” (p. 3). According to Marr et al. (2003) these dimensions are supported and encompassed by NAEYC.

Some educators use the term readiness to imply that schools need to be “ready” for children rather than children being ready to enter school (Saluja, Scott-Little, &
Clifford, 2000). As Edwards (1999) states in his study, “A school is “ready” when teachers have a solid understanding of child development, respect the individualized nature of development, and incorporate various cultural and ethnic issues into curriculum” (p.1). See Appendix A for a model on school readiness and the factors that can contribute to it.

Howes (1989), cites the developmental theorist, Jean Piaget, in his study *Pressuring Children to Learn versus Developmentally Appropriate Education*; according to Piaget, “development occurs in a proper rhythm as a result of genetic inheritance and environmental factors and with changing trends in society” (pg. 182). Howes (1989) notes the trends educators and other school professionals are seeing in today’s society that are affecting school readiness and in preparing children for school are rooted in how the child is affected by the home environment he or she is growing in and the opportunities they are able to experience prior to school entrance. These trends include: more one-parent families, higher divorce rates, busier families, more children in child-care, more television and video game watching, and less interaction with parent/s in the home compared to at the beginning of the century. According to Marr et al. (2003), these factors or trends seem to be more common in rural communities because children are more likely to come from lower socioeconomic backgrounds, where opportunities are less and home environments are more problematic. According to the Child Trends DataBank Household Survey (2005), there is evidence that demonstrates children living in poverty are much less likely to have good school readiness skills because these trends are becoming more and more prevalent, especially in rural communities; Title 1 schools are seeing children enter school with more readiness gaps.
Occupational therapists are not new to addressing school readiness gaps children face upon entrance to school. Occupational therapists are involved in providing intervention programs for children who have a delay in the developmental skills needed for academic learning. Occupational therapists address gross and fine motor, vestibular, balance, and visual perception skills that interfere with regular learning (American Occupational Therapy Association [AOTA], 2002). School occupational therapists often become involved because of a referral from Special Education Services and other times therapists are approached by school personnel when a student seems “clumsy,” “awkward,” or has not yet developed the skills needed for formal learning. Occupational therapists also become involved in programs targeted to address school readiness because these programs address skill development.

Children enter school with a wide range of knowledge and skills and there is no exact profile of when a child is “ready” for school and what he or she should know and be able to do. Nevertheless, children whose knowledge and skills are far behind those of their new classmates do enter school at a disadvantage. If they are unable to catch up, they face greater challenges throughout their school careers (Child Trends DataBank, 2005).

Purpose of this Study

In response to school readiness studies, it is being recommended that schools offer programs that are more comprehensive and that offer intensive developmental education principles to children that are considered at-risk. These programs should target children in lower income categories that do not yet show the skills, knowledge,
behaviors, and accomplishments expected of children as they enter kindergarten (Child Trends DataBank, 2005).

The purpose of this project is to closely examine a program called Stimulating Maturity through Accelerated Readiness Training (SMART), a comprehensive developmental program for children ages preschool through third grade; and to determine how occupational therapists can help implement and promote the use of this program. The intended outcome of this project is the development of a protocol that occupational therapists can use to facilitate involvement in and promotion of the SMART Program to help address school readiness issues. A detailed description of the program is included in the following section of this chapter.

The SMART Program

The SMART program started with A Chance to Grow (ACTG), a non-profit agency based in Minneapolis, which was established in the mid-1980’s by a group of parents to help their children who were challenged by serious brain injury and development delay; the parents wanted to give their children a better start to school. The agency co-founders and co-directors, Bob and Kathy Deboer, developed this program to help stimulate the injured brain and produce functional gains. They eventually joined with Dr. Lyelle Palmer, a Special Education professor from Winona State University, to establish the program called SMART (formally called Boost-up) and together they would eventually form what is now called the Minnesota Learning Resource Center (MLRC); the training center where the program and staff now operate. The parent’s and founders’ goal with SMART is to assist all children who seem to struggle to learn, for any reason, and to give them the skills they need to be “ready” for school (Palmer, 2002).
“SMART is based on a new understanding of how the brain works, and is specifically designed to improve the physical, visual and hearing skills necessary for reading and academic success,” according to one of the founders, Dr. Lyelle Palmer (2002, p.10). The program infuses and integrates neurostimulation activities into regular academic curriculum and focuses on developing high levels of readiness in pre-kindergarten through third grade students. While SMART can help all children increase their motor skills, eye-hand coordination, visual perception and reading skills, it is particularly effective in helping alleviate learning readiness gaps for students in the bottom half of academic achievement. Additionally, the program compensates for children’s lack of stimulation during the early years due to poverty and other factors related to low SES as seen in the research literature (Palmer, 2002).

The following descriptive material about the program comes from a variety of resources: Dr. Lyelle Palmer and his colleagues research in 2004, Dr. Lyelle Palmer’s 2000-2001 Summary Report (2002), and from the MLRC’s SMART Program’s Curriculum Guide (2005). “SMART is a multi-sensory movement curriculum that allows students to learn through developmentally appropriate curriculum to gain the readiness skills necessary to excel in the classroom” (Palmer, 2002, p. 9). It incorporates music, listening to directions, performing big motor movements (jumping or hopping), fine motor activities, visual activities, and other skill building games to learn and develop age appropriate skills in order to have the necessary skills for formal learning in writing, printing, and mathematics. “Having ‘fun’ and learning is proven to increase skills quicker, hold children’s attention longer, and make gains in all skills in coordination, motor abilities, and learning while playing socially and appropriately with their peers,”
according to Palmer (2002, p. 10). This program is getting back to a more developmentally appropriate way to learn—putting the “fun” back into learning and developing overall skills along with promoting academic success.

The SMART program is appropriate for preschool through third graders when used in the school curriculum, however the SMART curriculum and its concepts can be used at home and with children of all ages. “All children are included in the program” (Palmer, 2002, p. 9). It is implemented into the curriculum, and it is led by the classroom teachers themselves. The activities can be carried out in the classroom, on the floor, in the gym, on stage, in the wrestling room, and/or the playground (Palmer, 2002).

The SMART program is meant to be implemented at least every other day for 80 hours per year in order to effect change. The program requires some space to allow for easy set-up and removal of equipment; the area is often set up with an obstacle course layout. A space that allows for equipment to be left out on a daily basis is ideal, but is not always attainable in every school. The focus of the program is on completing activities correctly and repetitively to develop skills. The activities are also made to be easily adapted, rotated, and implemented with fun music; they are designed to be flexible for the teacher (Palmer, 2002). Sample activities can be found in Appendix B.

The SMART program’s activities can be used in three different ways: (1) a teacher can implement separate activities in the classroom using the key concepts of the program to promote developmentally appropriate learning. One such activity is tossing a ball to the student and having the student catch the ball and then answer the question versus just calling on a student. (2) the activities can be integrated into classroom teaching on a daily basis, such as having the children spin at their desk or by having
stations where children learn to print letters. (3) the SMART program can be implemented by the classroom teacher in a designated area for 20-25 minute intervals at least every other day (MLRC, 2005). The teachers and other staff who want to implement the program attend a three-day training and receive materials for setting up the curriculum. The SMART Program promotes including administrators, regular education teachers, special education professionals, paraprofessionals, volunteers, occupational therapists and physical therapists in the program implementation and training. The selected schools receive trainings for the teams of teachers, which are led by nationally and internationally recognized brain development authorities, such as Dr. Lyelle Palmer, and there are monthly on-site visits from the MLRC staff to ensure quality of replication of the programs they developed. Currently, over 30 schools implement the program in Minnesota and it is growing nationally according to the director of the MLRC, Nancy Farnham (Personal conversation, February 20th, 2006).

SMART works with the whole child, physically, socially and academically. These three areas are integrated and of equal importance. SMART also includes an assessment process, first, it allows teachers to identify difficulties with motor skills, especially the pre-academic skills that undergird school success, second, it helps identify different learning styles for children with a diagnosis of attention deficit disorder or attention deficit hyperactive disorder. Sometimes a child appears hyperactive in the traditional classroom but will not in this context. Third, difficulties in skills, such as difficulties with spatial awareness, visual perception, midline, and directionality can be pinpointed. Sometimes perceptual problems look like inattentiveness, and sometimes they manifest themselves as generalized academic trouble. Reading requires good
tracking skills, and math requires visual organization to understand place value. If these perceptual skills are lacking, the child will appear unmotivated. Fourth, social skills or lack of them stand out in the SMART Program. This happens because the program has characteristics that promote interaction between classmates. And fifth, individual learning styles are given an opportunity to surface. This is key because several studies have shown that not all students learn the same. SMART also offers and requires checks or “quick” evaluations on how the program is going for that particular classroom (Palmer, 2002). An example of a motor evaluation that is part of the program can be found in Appendix C.

The program is further described in the following chapter, however it is important to clearly define the innumerable benefits of the SMART program. The following are program benefits as described by the SMART Program founder in the 2000-01 Summary Report on the SMART Program (Palmer, 2002), the MLRC (2005), and from A Chance To Grow (ACTG), 2005. Here is a partial list:

- It is motivating and enjoyable, which is not insignificant. A relaxed happy child is more excited to learn, is more willing to take risks, and is more cooperative. It is exciting and challenging.
- Teachers and children love it. It is putting the “fun” back into learning and teaching.
- It is age and developmentally appropriate and the curriculum is based on developing school readiness skills needed for formal learning.
- It works on the foundation needed for reading, writing, and mathematics. It builds skills in motor, visual, and perceptual abilities to enable a child to print and read in the classroom.
- It makes sense to incorporate it into the curriculum and classroom because it is a developmental approach to learning.
- It provides an atmosphere for all children to learn at their own pace and skill level. It also provides an atmosphere for developing different learning styles.
- It is a nice “preventative” health program; fewer children are referred to special services.
- It aids in assessment and diagnosis of skills and performance.
• Five and six year olds who have taken part in the program have shown significant improvements compared to their peers not using it.
• Students using the program have increased reading levels in kindergarten by 500% or more in some cases.
• Overall research and findings of the increased skills in children is significant.

In an ideal world there would be a body of educational research that would carefully evaluate developmentally appropriate programs for preschool and kindergarten children, unfortunately, this literature is only beginning to emerge because of what is being found in kindergarten readiness studies. School readiness literature, reviewed in Chapter II, that supports the underlying assumptions of age and developmentally appropriate curriculum as described shows that it makes sense to incorporate physical movement and skill building to help children learn at a young age; long-term learning and development is enhanced by curricula that promotes active, experimental learning. Furthermore, aspects of early curriculum that involve learning during movement have been evaluated positively. The use of age and developmentally appropriate curriculum to develop school skills in the first years of academic learning is being shown by research on programs like SMART to better prepare children for a successful school career.

Occupational Therapy and the SMART Program

The core concepts and the foundation of SMART is coincidentally similar to the theoretical base of occupational therapy (OT), and it has come to the attention of many occupational therapists. In my work as a school occupational therapist for the past four years, addressing school readiness has become more and more of an intervention issue. Teachers report that they are seeing increasing numbers of children who are not developmentally ready for formal learning. In discussions with teachers and other professionals, the children that are not developmentally ready are the ones that seem to
fall through the cracks; they just barely make it or struggle through the early school years and often experience failure in later school years. It is being found through experience and discussion with school professionals that these children fall into three categories: (1) they need additional services, (2) they do not qualify for additional help; because they are otherwise healthy children with poor skills, or (3) they fail or no longer show up for school. As an occupational therapist, I have been asked to be a resource for troubleshooting ideas on what can be done for these children and for using the SMART Program to address these issues. I have been involved in promoting, implementing, and setting up the program, and in accumulating new activities to be used in the program. Using my skills and expertise as an OT to implement the activities in the SMART Program has also enabled me to educate teachers and promote the use of the activities during regular curriculum activities in the classroom.

The activities and multi-sensory approach used with SMART match the teachings and role an occupational therapist plays in pediatrics, specifically in the school setting. Many occupational therapists promote the use of multi-sensory approaches to learning because best practice indicates this is a more developmentally appropriate curriculum for young children (AOTA, 2004). SMART and its components parallel many theoretical foundations and the practice framework that is unique to OT practice (AOTA, 2002).

SMART works on skills that promote integration of reflexes such as the Asymmetrical Tonic Neck Reflex or ATNR, vestibular, gross and fine motor, auditory, visual perception and balance skills (MLRC, 2005). The Occupational Therapy Practice Framework: Domain and Process, that is unique to the OT profession, also uses those same terms in its performance skill and pattern descriptions (AOTA, 2002). The
SMART Curriculum Guide also notes that the activities are usually implemented with the aid of trained professionals such as occupational therapists (MLRC, 2005).

Occupational Adaptation and SMART

The Occupational Adaptation (OA) model of practice or theoretical framework developed by Schkade and Schultz (1992 & 2003) was used as the foundational model for the development of the product of this scholarly project that is found in Chapter IV of this document. Occupational Adaptation addresses the therapeutic process and its relationship with a client, rather than a specific outcome. “Occupational Adaptation is a phenomenon in which a person engages, rather than does what an occupational therapist says. . . . It is not the activity that is therapeutic, and it is not the occupation that is therapeutic, but it is the therapeutic process and its relationship that establishes what the patient will find (or accomplish)” (Schkade & Schultz, 2003, p. 182). Occupational Adaptation addresses looking at the occupational challenges the person is facing; in this case a student with poor readiness skills. The student will achieve what is called relative mastery through SMART in response to overcoming these challenges in what OA assesses in use of efficiency (use of time and energy), effectiveness (the extent to which the desired goal was achieved), and satisfaction to self (the extent the person finds it personally satisfying) (Schkade & Schultz, 2003). SMART uses frequency, duration and intensity of activities to promote change in a child’s skill level through fun, age appropriate activities that they can build at their own pace and achieve relative mastery (Palmer, 2002); this matches the OA model concepts.

The OA process allows a person that is faced with occupational challenges to change or adapt to master internal and external role expectations. The OA model looks
at the whole person, the environment where the occupation is being carried out, and then how the two interact. This is based on the prediction that a person desires mastery (student), there is a demand for mastery (academic expectations), and there is a force for mastery when the occupational environment and person interact to achieve success in the performance of their occupation such as in SMART (Schkade & Schultz, 2003).

The SMART Program looks at the student as the agent of change. Occupational Adaptation can be applied to the SMART Program because of the goals SMART has for a child’s school readiness skills. The SMART Program promotes adaptation in developing higher levels of mastery of skills to get the desired level of performance for entrance into school and to eventually obtain success at reading, writing, and mathematics. SMART’s goal is to produce a student who is ready for school and who will be successful in his or her life and school career (Palmer, 2002).

Viewing children from an OA approach in a holistic manner appears to be a meaningful way for occupational therapists to examine the challenges they face in working in schools and in assisting students to close school readiness gaps by being involved in programs such as SMART.

Occupational therapists can use OA in this setting to promote change or to help children that are not equipped with the skills they need before they enter school to develop mastery of readiness skills when they do enter school (Schkade & Schultz, 2003). This can be achieved by the use of a program such as SMART that promotes skill building with age and developmentally appropriate activities and curriculum.

This scholarly project is designed to take a closer look at the SMART program and how it parallels the goals school occupational therapists have in closing school
readiness gaps, especially those seen in rural Title I schools (see Appendix D). This project will also be used to look at the relationship SMART seems to have to occupational therapy and to develop a protocol as to how occupational therapists can be involved in using and promoting the program. The following chapter is a literature review that provides the foundational information for the development of the product and Chapter III is a description of the methodology used for the product development. The final product of this scholarly project, the protocol for occupational therapy involvement in the implementation and promotion of the SMART program, is found in its entirety in Chapter IV. Chapter V contains a summary of the project and recommendations for further study and research.
CHAPTER TWO

LITERATURE REVIEW

School entry is a major life transition. Its successful accomplishment may have a lasting impact on academic skill, learning incentive, social adjustment, and self-esteem. Consequently, it is important to isolate and describe factors that contribute to a child’s “educational readiness.” Evaluation based on these factors is likely to yield prescriptive and predictive information that can lead to the introduction of early services where needed, the provision of informed anticipatory programs, and the sustenance of a child’s individualized style of learning through adapting early curriculum. There have been a limited number of articles published that have examined the association between more developmentally appropriate learning in young school aged children and academic performance, however the ones that have been published send strong messages. The studies reviewed in this chapter examine school readiness skills and the factors related to readiness such as: (a) issues affecting school readiness skills today, (b) school skills that are being effected by poor readiness skills, (c) what is causing poor readiness skills, (d) what developmental research shows about learning at a young age, (e) research that shows there is a need for more to be done and (f) what is being implemented in schools to close the readiness gaps, specifically the SMART Program. The following literature supports the development of the product in Chapter IV; it shows that concepts such as
those used with the SMART program are beneficial and necessary in addressing school readiness in young children.

Historical Perspective of Early Education

For most of this century preschool and kindergarten provided programs in which children played. They played with blocks, on climbing structures, and in the housekeeping corner. In small and large groups they constructed elaborate fantasy games; explored adult roles, like being a firefighter; and fantastic dreams, such as being a dinosaur. The adults who planned these programs believed that through these play activities children learned to resolve conflicts, to make friends, and to be productive members of a group. "Children's play was believed to be the work of childhood (Howes, 1989, p. 181)." When the children were not playing, they might sit with a teacher and listen to a story; care for or feed animals like, a rabbit; or explore science materials, such as a microscope or insect collection. According to Howes, children learned as they played. They developed motor skills, attention skills, sharing skills, simple math, printing, and letter, number and drawing skills, all while they played.

According to Howes (1989), many preschool and kindergarten programs began to look a little different in the late 1980's from this well-established picture. The increasing pressures put on education, the Back to Basics movement, and the assessment of education put a changing face on what and how children learn. Today, children sit in circles or at tables and complete ditto sheets. The ditto sheets are designed to help children learn letters, colors or numbers. Children in large or small groups are given oral drills on letters, colors, and numbers. In other programs, computers are used to provide the practice and drill. Children do not interact with their peers like they used to and are
required to sit quietly and do their work. The same author also states, that even programs
that refuse to drill children in formal academic concepts are likely to reflect that they
must prepare the children for the academic pressures to come and therefore gently and/or
worriedly introduce a variety of formal academic materials to the children.

One argument for accelerated academics is that children have changed. Saluja,
Little, and Clifford (2000) argue that because of exposure to academics through
educational TV and technology, an increase in the numbers of parents with more
education, and the increased enrollment in daycares and preschool programs, children
simply know more than they used to. To some extent this may be true. In their study, the
authors showed that through repeated exposure to color words, 2-year olds may be able to
match the words for the colors to the color; however, the same child may know fewer
names for common barnyard animals than the farm child at the turn of the century.

Children's environments have also changed since the beginning of the century. In
today’s society rural schools, specifically in rural farming communities, are more likely
to have children that come from a lower socioeconomic status. Research performed by
Marr, Cermak, Cohn, and Henderson (2003), shows that a lower socioeconomic status
(SES) can lead to increased chances that these children come from one parent homes, and
have parents with lower education levels, live with parents that are busy, have parents
that interact less with their children or not all. These children may sit in front of the
television for long hours, and increasing numbers of these children experience increased
levels of conflict and stress in their home environments as they develop. According to
Marr, Cermak, Cohn, and Henderson (2003), educators are seeing lower skills in these
children in the areas of: motor development, visual perception, IQ, and attention span;
they are missing developmental components that prepare a child for more formal education.

Early Learning and Development

Child development also plays an important role on how children learn and what affects their learning. Historical theoretical findings and theory on age-appropriate learning and on how “ready” children are to learn state that development is a key component in what to expect from children entering school. In a study of developmentally appropriate learning, Howes (1989) writes that the historical Swiss theorist Jean Piaget identified the years between four and seven as the period of consolidation of the preoperational period of development before the emergence of concrete operations. Howes (1989) notes that Piaget stated, “Putting preschool children and kindergarten children in a transitional period of development and by age seven, most children will have reached the stage Piaget called “concrete operational thought” (p. 182). By this stage children can, with the help of concrete objects, begin to manipulate abstractions such as numbers and printed words, which is the content of formal school tasks (Case-Smith, 2000).

Howes (1989), also notes that the developmental theorist, Piaget, provides evidence through his theory that before children reach the stage of concrete thought, their thinking is tied directly to hands-on interaction with objects and people. They can think and solve problems in their heads and use symbols such as words and numbers, but they need concrete reference points (written labels on real objects). Although all children follow this progression, according to Piaget, it is true that some children develop at higher rates and enter school already having mastered specific skills over their peers.
Other children will enter school needing a long period of preparation to reach that point in their development. According to the Minnesota Department of Education (2004), "Preschool and kindergarten programs must be flexible to respond to all these children" (p. 37).

Bryd and Weitzman (1994) state in their study on development that the Gesell Institute located in New Haven, Connecticut, has always been an important force in suggesting that developmental issues must be considered in planning educational environments for young children. Personnel at the Gesell Institute speak of the "gift of time" and advocate keeping children out of school until they are ready. Unfortunately for many children, the gift of time involves testing, labeling, and beginning a school career behind that of their peers. Also, the bulk of current educational theory and research strongly suggests that development occurs only as a result of the interaction between the child and the environment. According to Byrd and Weitzman, if a child is given opportunities to engage in hands-on manipulation of materials within a rich and stimulating environment structured by a trained teacher, then the child will develop more abstract thought and be capable of understanding formal academic instruction. Without such instruction, a child may mature physically, but not be successful with formal academics.

In a study by Hartman, Miller, and Nelson (1999), the researchers make note of thoughts by the inherent American philosopher and educator John Dewey from way back in 1916 and 1966. The authors noted that he was one of the early educators that advocated the use of "active occupations" including play as well as work, as the best means of promoting learning and education in children. Dewey valued active, hands-on
occupations that are carried on for their own sake— as contexts for students to obtain skill and information. Observation leading to learning takes place when the person has something to do which can be accomplished successfully only through intensive and extensive use of the hand–eye, according to Dewey. Learning is an outcome of the enhanced sensation provided by the occupation as well as observed changes wrought in the occupational process (Hartman, et al., 1999).

According to Hartman et al. (1999), Dewey argues that the occupational approach to learning is superior to the traditional educational method of training through adult repetition. Dewey’s thoughts concerning occupation and learning influenced the founders of occupational therapy.

Given the commitment of Dewey and the profession’s commitment to the profession as a context for learning, it is ironic that little research can be identified in the occupational therapy literature, which directly addresses this issue. In the 1997 Eleanor Clark Slagel lecture; cited by Hartman et al. (1999, p. 478):

For decades occupational therapists have used common, everyday occupational forms and hands-on doing to enhance what Dunton (1945), one of the founders, called the ‘mental processes of reasoning or judgment or remembering.’ Recently, cognitive researchers, mainly psychologists, have developed a body of knowledge concerning the effects of ‘subject performed tasks,’ or SPT’s, on human cognition. The basic idea of SPT’s is that hands on doing, with its added sensory input and opportunity for feedback, is a greater stimulant than demonstration or other teaching techniques not involving hands-on experience.

Hartman et al. (1999) go on to write that Dewey and the early occupational therapists suggested that the opportunity for transforming materials in socioculturally recognizable ways is a key component to learning. We can think of this opportunity as part of the occupational form of an occupation. A therapist or educator is viewed as an opportunity giver, as opposed to someone who imparts information by talking. As the
learner pursues the opportunity with meaning and purpose, active occupational performance results in impacts. Studies outside the field of occupational therapy who have studied the effects of SPT’s have found that individuals who engaged in subject-performed tasks recall more than those engaged in passive learning (Hartman et al., 1999).

There are limited studies that have proven that learning by doing or moving increases a child’s learning, however it makes sense to most. In one of the studies examined by Hartman et al. (1999), Buddelmeyer (1995) took sixty children with learning disabilities between the ages of 8-13 and randomly assigned them to two groups. One group was assigned to hands-on occupation and the other to verbal training. Children in the hands-on occupation relieved step-by-step verbal instruction on how to make play-doh as well as hands on practice with each step. Children in the verbal training condition received step-by-step instructions only. After the final step for both groups, the children were asked to recall the steps involved in making the play-doh, in their proper order. A t-test supported the hypothesis that children in hands-on learning had higher memory retention than children in the verbal training group. In another study in the literature review examined by the researchers; 73 healthy third graders participated in making a model of a volcano or were assigned to observing the making of a volcano. Following task completion also, both groups were asked to recall and state as many of the 41 syntactical units as possible in their proper order. It also demonstrated the same results of the children in the hands-on group having greater recall.

The results of similar studies demonstrate that children were able to recall more information when engaged with hands-on teaching methods. This suggests that learning
advantages of hands-on experiences are related to enhanced sensory, perceptual, and olfactory experiences, and the feelings of success are characteristic of hands-on learning, as opposed to passive learning (Hartman et al., 1999).

The profession of OT stresses the importance of age-appropriate developmental activities for children from birth to build the foundation of skills and abilities needed upon entering school. OT is based on the theoretical foundations of theorists such as Florey, Reilly, and Piaget, which have helped influence the impact “play” has on children and their learning in the early years. OT’s core concept is based on learning through meaningful and purposeful activity, which for children is “play.” Case-Smith (2000), theorizes that in young children, “play” provides the opportunity for children to learn appropriately and engage in activities as an “active” participant. This also means that hands-on activity has been shown to be more meaningful for children. OT promotes that age appropriate skills are needed in order for children to learn and be ready to enter school. “If these skills are not in place, a child will struggle in school without intervention because of what is expected of them” (Case-Smith, 2000, p. 374). One of the most reliable principles implied by developmental research is that young children’s learning is enhanced when they are engaged in an interactive process and have a healthy stimulating environment to grow in (Marr et al., 2003). This is not always the case and educators, health professionals, and administrators are seeing more children enter school with poor readiness skills.

Environmental Risk Factors and Development

According to a study by Barros (2003), a biologically healthy child’s development can suffer from the negative influences of the environmental risk factors
they live in. Barros’s study evaluated gross and fine motor development in two different environments; day care center children and private school children and the correlation among features related to each setting. She found that children in public day care programs scored lower overall in motor development. She found the following factors had a negative impact on development: unfavorable postnatal conditions such as the parent’s relationship to the child, a poor amount of parent participation in the child’s routine, cultural and limited access to leisure activities, a mother’s low intelligence level, low socioeconomic status, and poor family environment conditions. These factors were demonstrated to have significant effects on motor and mental development in biologically healthy children proving a child’s environmental factors and the level of child-parent stimulation affect a child’s development and are predictors of skill level upon entrance of school.

In another study Noble (2005) states that there is growing concern over gaps being seen in school readiness. In her study, Noble used a more neuroscience perspective; she took a look at assessing readiness in terms of more specific brain functions. She found that factors such as socioeconomic status, children’s life experiences, and chronic stress in childhood can impair and change functional and anatomical brain regions involved in learning, memory, cognitive control, and reading; these are essential skills for success in school. According to Noble, understanding how a child’s experiences influence behavioral and brain development will make it possible to design educational curriculums to target the specific brain regions that underlie cognitive skill development important for academic success. Optimistically, children’s brains remain plastic and capable of growth and development; effective educational
interventions can begin to close childhood experience and socioeconomic gaps in readiness and achievement.

Another study that looked at environmental factors affecting readiness skills was completed by Joussemet, Koestner, Lekes, and Landry in 2005. This study used prospective longitudinal data to specifically examine the factors of early experiences of parental autonomy supports and children’s academic and social adjustment in third grade. According to the authors, this study was based on the self-determination theory (SDT), developed by Deci and Ryan in 2000, which states that humans have a basic, psychological need for autonomy and competence. The researcher’s goals were to examine the over-time relations of maternal autonomy support and other motivational strategies to children’s social and academic adjustment. The most important finding was that maternal support of autonomy measured in kindergarten was positively associated with social adjustment, academic adjustment, and reading achievement in the third grade. These results are consistent with the self-determination theory’s proposition that support of autonomy facilitates healthy and integrated functioning especially in promoting academic success.

To determine actual readiness for school, Perera (2005), completed a community survey that assessed the development of 4-5 year old children in a low-income community. The aim of this survey was to investigate the children’s readiness for formal education. A modified Denver Developmental Screening Test was used to determine the presence of age-appropriate motor, cognitive, language, and social skills in 295 children. Of these children, 17.8% were unable to perform more than 50% of the tasks correctly. It demonstrated that children with motor problems were more likely to have difficulties
with cognitive tasks than children with normal motor function. Perera found that adverse conditions such as social deprivation, malnutrition and the low educational level of the mother were all factors in the findings because the study was done in a low-income area. These factors seem to cause a delay in a child’s ability to develop school readiness by age five. According to the results of this study, neurological maturity, intellectual ability, and psychological development have an impact on the readiness of children to enter school and their ability to manage school curriculum effectively. Similarly, Bowman and Wallace (1999), found that 22 preschool children from low to low-middle economic communities scored significantly lower on the Developmental Test of Visual Motor Integration (VMI; developed by Beery in 1997) than 22 matched children from high socioeconomic communities. This indicates that these children are at higher possible risk for later motor developmental difficulties.

Research consistently and continually reports that factors such as persistent poverty or low economic status have detrimental effects on IQ and school achievement. Poverty is usually correlated with perinatal complications; less home-based cognitive stimulation, childhood stress, and parental absence which have been shown to lead to poorer academic readiness skills and achievement. Mcloyd (1998) studied child development and socioeconomic disadvantage and how it affects readiness skills. She found that children who lived in poverty consistently scored below the average mean on IQ tests and that income has a direct impact on IQ levels. Poverty continues to be a problem in rural America and children from rural low income areas are entering schools without the skills needed for academic performance and, overall, tend to demonstrate lower levels of achievement and school readiness skills.
In a study by Hofferth, West, Henke & Kaufman (1994), the researchers conclude that parents are children’s first and most important teachers and are critical to their children’s success in school; but sociodemographic risk factors have been found to be associated with problems in learning after children start school and this correlates with the accomplishments and difficulties children bring with them when they arrive at kindergarten. Furthermore, in a study completed by the Minnesota Department of Education (2004), five risk factors were examined: (1) the mother has less than a high school education, (2) the family lives below the official poverty line, (3) the mother’s primary language was not English, (4) the mother was unmarried at the time of child’s birth and (5) there was only one parent present in the home. These risk factors were found to be associated with fewer accomplishments and more difficulties in children, even after other child and family characteristics are taken into account. Nevertheless, low maternal education and low SES were found to be most consistently associated with fewer signs of emerging literacy and a greater number of difficulties in kindergartners (p. 16 & pp. 50-59).

Data from the National Household Education Survey included in the Child Trends DataBank (2005), shows three through five year old children living in poverty are much less likely to have the cognitive/linguistic school readiness skills than children living above the poverty threshold. It also shows that skills tend to increase with age, however, it was found this was true for children above the poverty line; where skills tended to decrease for children who fell below the poverty line as they got older.

Studies from Head Start, which is a federal preschool education program specifically designed to help children from low income families, found that children from
families with low incomes who do not attend Head Start demonstrate significantly lower motor skills in kindergarten than children from families with incomes above poverty who had not attended Head Start. These results suggest that preschool children from families with low incomes are at risk for delayed fine motor skills which may influence their school performance in the early elementary years if the delays are not addressed (Howes, 1989).

The findings from the *Minnesota School Readiness Year Three Study: Developmental Assessment at Kindergarten Entrance Fall of 2004*, adds to the pool of information we have for better understanding and responding to the school readiness of Minnesota children both before they begin school and once they enter kindergarten. Results collected from 20 school districts assessed 3,423 kindergartners upon entering school using a teacher assessment and parent survey on five domains; (1) Personal and social development, (2) Language and literacy, (3) Mathematical thinking, (4) The arts, and (5) Physical development. The study results showed that out of 3,423 kindergartners studied that 28% of the school district’s kindergartners were rated as “not yet” developed with the skills for physical development and language and literacy. These two domains stood out as having the poorest ratings. This information obtained on a strategic sample of children entering kindergarten provides further evidence that Minnesota children enter school not ready for success and that children need to be greeted by an environment that has the capacity to address the diverse needs of every child abilities (Minnesota Department of Education [MDE], 2004).

In the same study done by the MDE (2004) a survey for parents was included to get background information on parental educational level, household income, and gender.
The survey results showed that, overall, children not yet showing the expected readiness skills were more likely to be children who live in poverty or experience other risk factors that make them vulnerable to school failure. Gender did not seem to play a role in the study. Furthermore, The percentage of kindergartners “not yet” showing the skills had parents with the least education and with lower income levels, demonstrating further that the environments in which children grow and develop can impact how prepared they will be for school.

Occupational Therapy and Early Learning

Evidence supports the effectiveness of occupational therapy intervention in the school setting for goal attainment and skill development in areas underlying and supporting school performance. A child’s occupational performance may be impaired by physical, developmental, sensory, attention and or learning challenges. The goals of the occupational therapist are to improve the student’s performance of tasks and activities important for successful school functioning. The occupational therapist is concerned with ensuring an understanding of, and match between the student’s skills and abilities and the expectations placed on him/her in the school setting. The occupational therapist looks at school performance in the areas of reading, writing, mathematics, manipulation of tools, performance in physical education, independence with self-care tasks and social integration as being dependent on gross motor and fine motor abilities, visual motor integration and visual perceptual skill level in children (Case-Smith, 2002).

In a study by King et al. (1999), the researchers concluded that occupational therapists play a role in reframing the views of parents and teachers concerning the discrepancies between student performance and the expectations held for them.
Occupational therapists enable a more positive view of the student and provide a basis for developing more effective teaching and/or parenting strategies.

It is important to address contents of the *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2002), because it provides a comparison on how the SMART program includes OT terminology, uses the same activities, and seems founded with the same core beliefs as OT. The OT framework is described as the next evolution in a series of documents that have been developed over the past several decades to outline the language and constructs that are unique to and describes the profession’s focus. It clearly affirms the focus on occupation and daily life activities and the application of OT intervention to facilitate engagement in occupation to support participation in life. The framework describes the profession’s focus and actions. Occupational therapists assist people to engage in daily life activities that they find meaningful and purposeful in order to perform and engage in their occupations. Occupational therapists look at performance skills, (which include motor skills, vestibular skills, and perceptual skills, process skill, which includes energy and organization skills, and communication and interaction skills) performance patterns (habits and routines), the context (cultural, physical, and social, and client factors on how they effect performance on occupation (AOTA, 2002). The goal of school occupational therapists is to improve the student’s performance of tasks and activities using the framework to ensure successful school functioning (Case-Smith, 2000).

Furthermore, a growing body of OT research supports the critical relationship between early childhood experiences, school success, and positive life long outcomes. The acquisition of motor skills is an important aspect of children’s developmental growth.
because fine motor skills enable children to participate in valued occupations in the areas of daily living, education, play, and social participation (Case-Smith, 2002). National education goals describe fine motor skills as one of the dimensions needed by kindergarten children for learning readiness (National Education Goals Panel, 1993). Both early childhood educators and pediatric occupational therapists focus on developing fine motor skills in preschool children to enhance readiness for learning (Case-Smith, 2000). Within the educational community, the specific fine motor criteria for school readiness have not been universally established. Before fine motor criteria for school readiness can be established, greater understanding of the current fine motor activities of early learning environments such as preschool and kindergarten classrooms is needed. According to Marr et al., (2003), an increased understanding may assist educators and occupational therapist to better prepare preschool children, especially those at-risk for fine motor delays, for the kindergarten experience.

**School Readiness**

According to Bowman and Wallace (1999), the MDE (2004) and a study by Howes in 1989, school readiness is becoming more and more of an issue due to three main factors evident in the research: (1) Expectations of children upon entering school today, (2) Children are not developing the skills they need in their home environments, and (3) Offering age-appropriate curriculum is being “pushed-down” to replace it with more formal academics then ever before.

Specific characteristics seen in young children that seem to affect school readiness skills needed for learning were proposed and demonstrated in a study done by Sigmundsson and Hanson (2004). In investigating the performance of eight-year-old
children diagnosed as "clumsy," (children that seem to struggle to learn motor skills otherwise mastered by their peers) specifically those with hand-eye coordination problems. The researchers examined the new insights that have been made into the nature of motor impairments that afflict these children such as; the poorer performance of children with hand-eye-coordination problems on recognition tasks supports the prediction that these children would have problems on tasks involving visual recognition with school tasks, which can lead to their learning difficulties over time. Certainly, the prevalence of learning difficulties is high among "clumsy" children as research shows. The study results indicate that children with even minor motor impairments show a clear deficit in visual recognition, which is a necessity in building school skills and in determining levels of school achievement.

Another factor is that parents and physicians often dismiss seemingly minor motor difficulties in children. According to Hamilton (2002), an M.D, approximately 6 percent of school-aged children have coordination problems serious enough to interfere with academic performance and social integration. According to the author, the problems often arise during the early school years and manifest in simple motor tasks such as in running, buttoning, or using a scissors. Increasing evidence shows that rather than improving over time, these motor difficulties remain delayed throughout adolescence and adulthood if not addressed early on. Motor difficulties are usually associated with other problems such as attention problems, learning disorders, or even emotional immaturity and they tend to magnify over time. As teenagers, children with motor problems have higher rates of educational, social, and emotional problems. Hamilton finds that this effects between 5-15 percent of school aged children between the ages of six and twelve.
He suggests helping these children by involving them in sports activities; by altering the child’s academic and physical education classes to match the child’s abilities; and, based on current data, by involving occupational therapy as an individualized approach.

In linking motor problems with learning problems, O’ Brien, Cermak, and Murray (1988), examined visual perceptual motor abilities and clumsiness in children. The researchers found a clear connection between children that were found to be clumsier than their peers and their success at learning. The findings were that low visual perceptual skills led to those children being diagnosed with a learning disability or they demonstrated low levels of success and achievement in academics. The authors stated, “If these problems were not addressed early on, it was found that the same effects were found and continued into secondary levels of schooling” (p.361). O’Brien and her colleagues found overall that children who demonstrated clumsiness also demonstrated difficulty in learning due to poor visual perception skills.

A study by Bonifacci (2004) did not show this correlation between motor ability and visual motor ability described by O’Brien et al. (1988). His study examined perceptual, visual motor abilities and intellectual skills in children with low, average, and above average motor abilities. One hundred forty-four children aged 6-10 years attending elementary school were included in this study. Based on the standardized testing, the analysis did not provide strong evidence to support a strict interrelation between perceptual abilities and motor abilities. Rather, it is possible to observe a weakness in motor coordination in the absence of difficulty in perceptual ability. In studying children with low motor abilities, it is useful to maintain a broader perspective which considers different components in combination; at the same time, it is necessary to
employ more specific tasks when assessing the relationship between perception, visual motor integration and intellectual functioning.

Because of these findings Watson et al. (2003) wanted to examine further how to close these readiness gaps. The authors demonstrated a new understanding in school readiness in that “Until the early part of the 20th century, children who failed in the first few years of elementary school were regarded as simply lacking in the necessary innate abilities to develop academic skills and research in the latter half of the century supported a variety of alternative hypotheses” (p. 165). The authors note that failing children suffer from attention problems and central processing disorders such as poor working memory. “In recent years, relatively strong associations have been demonstrated between failure to read and the absence or weakness of certain linguistic abilities, broadly termed phonological awareness; and now we tend to look at habitability, family attitudes and behaviors and environmental factors” (pp. 165-166). Watson et al. (2003) administered standardized sensory, perceptual, linguistic, intellectual, and cognitive tests to 470 children entering the first grade in four elementary schools over a three-year period. The proportion of students that performed poorly on reading achievement also performed poorly in other areas of academic achievement. A strong predictor of reading and mathematics grades, according to this study, was the visual cognition factor and verbal cognition factor. It was found that the poorer the visual perceptual skills and language development the poorer the academic performance of elementary school children. According to this study, the level of verbal, cognitive, motor, visual, and pre-reading skills of a child before entering school predicts school achievement and success.
In another study that looked at predictors of early grade retention, Byrd and Weitzman (1994) found that nationally, 7.6% of children repeated kindergarten or first grade. Factors associated with increased risk of grade retention were poverty, male gender, deafness, speech defects, low birth weight, exposure to household smoking, health of the child, education level of parent or parents, and residence with one parent. They found the factor that could have made an important impact was that pediatricians are often the first or only professionals to regularly see and evaluate children and families before a child’s entry into school. The authors further discussed, “That the children’s poor skill levels are not being detected early on in order for these children to receive services to ‘catch them up’ before entrance to kindergarten, instead more and more children are entering kindergarten with poor skills for learning” (p.481).

The National Education Goals Panel (1993) advocates that awareness and advocacy for children that are “at risk” for poor school readiness skills means looking at what factors or needs of the child are not being met; then providing for these deficiencies in the curriculum. The panel describes fine motor skills as one of the most needed dimension by kindergarten children for learning readiness. Before fine motor criteria for school readiness can be established, a greater understanding of the current fine motor activities of early learning environments such as preschool and kindergarten classrooms is needed. A study by Marr et al. (2003), compares the fine motor activities in Head Start and kindergarten classrooms in order to open a dialogue between the two contexts about activities children in preschool will face in kindergarten. Children were observed in Head Start and kindergarten and activities were looked at to see how much time was spent performing fine motor activities. The study found that the greater the amount of
time children spent on fine motor activities in Head Start, the better prepared they were for the increase in motor demands in kindergarten. Paper and pencil activities substantially increase in the kindergarten setting and changes in Head Start curriculum to address this increase in fine motor demands could facilitate a smoother transition. This increased understanding may assist educators to better prepare preschool children, especially those at risk for fine motor delays for the kindergarten experience.

Improving School Readiness

Dr. Lyelle Palmer (2002) and his colleagues state the following in the Minnesota Learning Resource Center’s 2000-01 Summary Report, “As a society, we continue to assume that children have acquired the readiness skills necessary to be able to learn to read by the time they enter school” (p. 2). These readiness skills include oral language development (listening and speaking), visual recognition and discrimination, eye-hand coordination, social interaction patterns, attention for following directions, pencil-paper skills, general coordination for gross movement and self-confidence for resilience in the face of challenges. “Teachers, administrators and health professionals know, however, that they can expect an extreme range of abilities in the classroom” (p. 2). They also see that differences are often related to socioeconomic levels, with children from poverty exhibiting lower skill levels than those from middle to upper class backgrounds. For example, “Some children may enter kindergarten with a vocabulary of 4,000 words, while children from deprived environments in the same class may only know 2,000 words” (p. 2).

How do we improve children’s skills to give them a good start their school career and prepare them better for life-long success? Hartman, Miller, and Nelson (1999) note
that it is best described by the eminent American philosopher and educator John Dewey, who's ideas eventually contributed to the founding of the occupational therapy profession. He advocated the use of “active occupations” including play as well as work, as the best means of promoting learning and education in healthy children. He valued active, hands-on occupations that are “carried on for their own sake” as contexts for students to obtain skill and information (pp.477-478). Based on these principles and prior studies supporting the use of hands on occupation to enhance learning and to assist in better preparing children for school.

It was hypothesized by Hartman et al. (1999), “that participants that engage in a hands-on teaching method would have a greater recall score than those who participated in a demonstrative teaching method” (pp. 479-480). In their study, they assigned 73 healthy third graders to make a model volcano; the third grade classes were randomly split into two groups. One group actually made a model and the other simply observed the making of a model volcano. Following completion, both groups were asked to recall and state as many of the 41 step by step directions as possible in their proper order. The study results showed that the children involved in the hands-on experience had far greater recall scores then those that just watched. This suggests that the learning advantages of hands-on occupation, such as in this study are related to enhanced sensory/perceptual experiences and the feelings of success as opposed to passive forms of learning. This study contributes to the establishment of a valid base of research supporting the principle of hands-on learning, especially in the early school years.

Also, research done by A Chance to Grow (ACTG), in Minneapolis, MN. (2005), summarizes on its website (www.actg.org) that, “Our physical movement can directly
influence our ability to learn, think, and remember and it has been shown that certain physical activities that have a strong mental component, such as tennis or soccer, enhance social, behavioral, and academic capabilities” (p. 1). The authors go on to note that evidence is mounting that each person’s capacity to master new and to remember old information is improved by biological changes in the brain brought on only by physical activity. “Our physical movements call upon some of the same neurons used in reading, writing and math” (p. 1). The authors of the website promote that physically active people reported an increase in academic abilities, memory, retrieval, and cognitive abilities; “What makes us move is also what makes us think and certain kinds of exercise can produce chemical alterations that give us stronger, healthier, and happier brains” (p. 1). It is also written, “A more active brain is better equipped to remember, and to learn” (p. 1).

Another factor is that research suggests that music is beneficial in teaching both social and academic skills to young children. Register (2004), examined the effects of a music therapy program designed to teach reading skills versus a television program on early literacy. In this study, 86 kindergarten students between the ages of 5-7 and who were who from low socioeconomic background were assigned to one of four treatment conditions; those conditions were music/video, music only, video only, and a no contact control group. Standardized tests were administered and the study results showed that the music/video and music only groups achieved the highest increases in mean score in reading skills. This study also confirms that active learning, such as using music, increased the on- task behavior by students and subsequentially increased learning at a faster rate. The author notes this pattern supports the need for further investigation
regarding benefits of enrichment programs specifically designed to enrich our curricula for students from low socioeconomic backgrounds, particularly programs that incorporate music activities.

In a study by Davies and Gavin (1999), a comparison was made to determine if there was a difference in learning in preschool children with developmental delays in an effectiveness of group learning versus individual learning. Davies and Gavin, found that most people perceived that individual treatment always surpassed having a child learn in a group atmosphere; therefore, the purpose of this study was to assess whether individual or group learning methods would result in greater motor gains. The findings of this study can be summarized with four points. First, subjects in both treatment groups demonstrated significant increases in both fine and gross motor skills. Secondly, there were no statistically significant differences between treatment methods on any of the assessments performed. Third, the parents also observed the gains in motor skills, and fourth, the rate of motor skill development approximated that of the normal distribution of typically developing children. This supports that skills can be learned through enrichment programs offered to entire classrooms just as well as on an individual basis.

Case-Smith (2000) completed a study titled *Effects of Occupational Therapy Services on Fine Motor and Functional Performance in Preschool Children*. The study examines how performance components and variables in intervention influenced fine motor and functional outcomes of 44 preschool aged children with fine motor delays. Each child received occupational therapy services; the children received an average of 23 sessions in both individual and group format. Most sessions included fine motor activities, peer interaction, and play skills. The findings suggested that the use of play
activities and peer interaction were important predictors of higher skill levels at the end of the year than that of just focusing on fine motor activities. The results also showed a strong correlation in the importance of therapeutic use of play in intervention with preschool children and the need to consider age-appropriate learning when looking at performance. These results are similar to those of Davies and Gavin (1999), in showing that play and peer/group learning is significant in providing the best learning environment for young children. Learning through developmentally appropriate educational activities is supported through both studies.

Few teachers, administrators, and parents would argue with the assumption that physical activity and more age-appropriate techniques to learning are likely to help children perform better in school. "Physical activity improves general circulation, increases blood flow to the brain, and raises levels of norepinephrine and endorphins— all of which may reduce stress, improve mood, induce a calming effect, and even perhaps improve school achievement" (A Chance To Grow, 2005, p. 1). Taras (2005) reviewed several published studies on the association between physical activity among school-aged children and academic outcomes. There were 14 articles that Taras reviewed that examined this issue. The studies split evenly in that half showed that there was a weak to no correlation between students that participated in physical activity and how it affected academic achievement, while the other half of the studies reviewed showed that there was a significant correlation between participating in physical activity and increased academic scores. In the studies that found a significant correlation, the data showed the following; that students who participate in sports and extracurricular activities performed increasingly better academically, that math and reading scores increased as balance and
coordination increased, that fine motor control was better in physically active children, and that favorable effects were found in academic achievement when higher skills were present in the areas of attention, retention, visual perception, recall and memory, and in fine and gross motor abilities. Although, the results were mixed there is evidence to suggest that short-term cognitive benefits of physical activity during the school day adequately compensate for time spent away form other academic areas (Taras, 2005).

Dr. Lyelle Palmer from the A Chance To Grow Program in Minneapolis, Minnesota has researched the development of the brain and how various stimulation affects learning. His main points are important to note; he states, “The latest brain research continues to confirm the idea that a child’s brain, which develops at a rapid pace between conception and the early school years, is receptive to stimulation. Scientists describe this phenomenon as ‘plasticity.’ Researchers know that by increasing the frequency, intensity and duration of specific stimulation, a child’s brain can become efficient in receiving and processing information. This will then put the child’s brain in an optimal learning state” (Palmer, 2002, p. 2).

Based on these research findings, a number of national, state, and local initiatives, including Goals 2000, Head Start, Minnesota First Grade Preparedness, Minneapolis Junior Kindergarten, district extended- day and all-day everyday kindergarten, have provided resources in an attempt to counteract rising poverty levels and lower readiness levels of students from all socioeconomic levels. The underlying idea behind these programs is that by increasing a child’s readiness skills their academic achievement will also increase (Palmer, 2002).
Although these efforts have helped, more needs to be done to help student achievement. According to the MLRC’s 2000-01 Summary Report on SMART (Palmer, 2002) in Minneapolis, Minnesota included the National Assessment of Educational Progress 2000 Reading Assessment Results, which indicated that 37% of fourth graders in Minnesota were reading below a basic level. Among students who qualify for free or reduced priced school lunches, a common indicator of low-income status, 60% could not read at a basic level. For many underachieving students, especially those growing up in poverty, the problem begins before they ever enter school. This is because they lack the readiness skills needed to progress at the same rate as their peers. Readiness, as previously stated, has traditionally been considered social readiness, which is having the ability to sit still and follow directions, possessing language abilities for listening and having adequately developed social skills for participation in kindergarten activities. However, a new understanding of the brain’s connection to learning has led to identification of neurological and physiological readiness gaps. These gaps include delays in visual perception, poor auditory processing skills, attention and impulse disorders, poor eye-hand coordination, and poor physical balance (Palmer, 2002). Unless student’s learning readiness gaps are addressed in the early elementary years, many students will have great difficulty learning in the academic curriculum. This will cause many children to become increasingly frustrated and eventually predicts failure school.

In response to this new understanding, educators and policy makers declared the 1990’s the “decade of the brain.” Popular and professional publications including Newsweek, Time, Life, and Educational Leadership included articles focusing on practical neuro-developmental aspects of infancy and childhood. Teachers learned of
these benefits of integrating brain development activities into the classroom in order to enhance the academic curriculum and increase student performance (Palmer, 2002).

Due to these “new” understandings of how the brain works and the evidence we are being provided that children are entering kindergarten without the essential skills to learn formally; it is the responsibility of the adults in the children’s lives to ensure they have a good start to school. With the research results showing there is more and more need to help children prepare for learning, there has been a response to these findings by implementing a variety of programs to remediate delays in readiness skills. Some of the responses include: proposing policies to raise incomes of poor families, developing more programs such as pre and post kindergarten or transitional phases in school, implementing “No Child Left Behind” supported by President George W. Bush, and it has even been suggested by Minnesota Governor Tim Pawlenty that a stronger education piece needs to be implemented into all child-care homes and facilities. This has also strengthened the case for implementation of programs such as Head Start and the expansion of more intense educational programs that promise to produce enduring effects on school readiness (Palmer, 2002).

SMART Program

In 1995, in response to this evidence and need for programs to improve school readiness skills, a group of parents looking for a better chance at success for their children with serious brain injuries and developmental delays founded a charter school called A Chance to Grow, a New Visions School in Minneapolis, Minnesota. The curriculum they introduced and used with their children developed into the A Chance To Grows SMART Curriculum Guide. “The curriculum was a multi-sensory approach to
learning" (Palmer, 2002, p. 9). Eventually, Dr. Lyelle Palmer in conjunction with Bob and Kathy DeBoer founded what was initially called the Boost-up Program; it has currently been renamed the SMART (Stimulating Maturity through Accelerated Readiness Training) Program (Palmer, 2002).

The program was designed to develop and enhance the physical readiness skills necessary for children to have successful experiences. The activities consist of visual perceptual, balance and vestibular, gross and fine motor, auditory, visual efficiency, and visual perception activities (See Appendix E). Dr. Lyelle Palmer and the other founders further developed the program in order to use it to address the school readiness gaps in children entering school, especially those children growing up in low income families. The programs success and significant results in closing school readiness gaps have caused it to be replicated in many other Minnesota schools today. It is being replicated in over 30 schools in Minnesota and its use is growing in schools nationally. The program is meant to be used with children in grades preschool through third grade; “The goal is that the foundational skills needed for academic learning will be ‘boosted’ into place through providing stimulation the brain needs to mature or ‘catch up’ developmentally through the SMART Program in order for all children to have a good start to school” (Palmer, 2002, pp. 9-10).

The SMART Program is one of the programs that ACTG offers through the MLRC training center in Minneapolis, Minnesota. In 1987, it MLRC expanded to collaborate with the Minneapolis Public Schools on a four-year project to compare the impact of SMART with that of traditional kindergarten. “It was found that students in the traditional kindergarten program could not meet the district’s first grade readiness
requirements, even though they had completed a full year of regular kindergarten” (p. 10). During the project, one set of classes spent 93 hours per year in SMART; the other set received only the regular curriculum. At the end of each year of the project, the SMART students were reading at the 82nd and 89th percentile of Minneapolis students entering first grade and most of the students in the control classrooms were barely meeting district’s criteria for entering the first grade. “An even more significant finding, however, was that the children who received the SMART program maintained their reading gains through the second grade, while more than half of the control students were failing in reading by the second grade” (Palmer, 2002, p. 10).

Research during those early years demonstrated that all children in the primary grades, from those who were struggling to those who are at or beyond grade level, benefited from the SMART program. By implementing ACTG’s SMART Program at the charter school initially, it was determined that early elementary aged students, especially in Title I Schools, who complete at least 80 hours in the SMART program gained six to eight months in reading skills (Palmer, 2002).

The findings made this program a success and with funding from the Federal Government the Minnesota Learning Resource Center, a training center, was created in 1999 in order to train schools that wanted to replicate the program in Minnesota and nationwide. The MLRC organization provides a three-day training to teachers and school staff because the program is implemented by the classroom teachers in their daily curriculum. SMART incorporates music, obstacle courses, games and stations, spinning, rolling and many other activities to accelerate students learning. It works by using three characteristics: (1) Frequency in repetition of multi-sensory input of material or
information through different activities, (2) Intensity, which includes high quality of participation and active involvement of students, and (3) Duration, and by having a consistent amount of time spent in a program, at least 80 hours per year to produce a change in the body and brain. These characteristics are no different than what education material is based on, however, the frequency, duration, and intensity are at a higher level due to using a multi-sensory approach to increase fine motor skills such as those needed to print well (Palmer, 2002).

Palmer (2002) notes, “SMART’s brain stimulation and input emphasis is in direct contrast to the typical (trying) approach used in the overwhelming majority of classrooms” (p. 10). This means that SMART puts emphasis on child development and on age appropriate learning inorder to develop a child’s brain when learning to print, read, and perform math tasks. Schools typically use the (trying) approach of children; sitting at their desk completing ditto sheets or pencil and paper activities to learn how to print letters, in contrast, SMART uses activities that work on the foundational skills needed to perform these actual school tasks. SMART uses brain stimulation activities that increase exposure to sensory stimuli, resulting in increasing brain activity by more than one thousand percent compared to ordinary classrooms; due to output of a children’s “trying” is increased. “By using heightened stimulation levels with more repetitions of the stimuli for longer duration in all senses, student’s brains receive more preparation before attempting to perform” (Palmer, 2002, p. 10). The result is SMART students’ performance is quicker, higher quality and more confident than student performance in ordinary classrooms.
SMART is proving itself through data collected early on when it was initially developed and now in schools currently using the program. In a collective data summary report by the MLRC in 2000-01, results of measures of neuro-development, academic readiness and academic skill were presented as medians of the distributions of class medians from various sites. Fourteen classes were assessed and compared to three classes. Kindergarten students using the SMART program for one year demonstrated higher skills than that of the control group. Schools use a variety of informal measures to gauge performance in kindergarten, some of which are provided at the training. Some of the results show an increase in abilities that indicate an increase in school readiness and all together measures indicate improved early literacy levels. The available data from the Palmer (2002) summary reports made median comparisons between control and SMART classes in visual and listening readiness, reading and printing. The SMART advantages were as follows:

<table>
<thead>
<tr>
<th>SKILL:</th>
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<tbody>
<tr>
<td>Smooth Eye-Hand Pursuit Ability:</td>
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<tr>
<td>Near-Point Visual Convergence:</td>
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<tr>
<td>Auditory Discrimination Ability:</td>
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<tr>
<td>Sound Blending Ability:</td>
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<tr>
<td>Reading 32 Most Common Words:</td>
<td></td>
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<tr>
<td>Reading 37 Basic Words:</td>
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<tr>
<td>Printing Skill:</td>
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<table>
<thead>
<tr>
<th>RESULTS:</th>
<th></th>
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<tbody>
<tr>
<td>14-39% of more students mature in SMART classes</td>
<td>2-3% more students mature in convergence.</td>
</tr>
<tr>
<td>30-43% more students mature with SMART</td>
<td>30-43% more students mature with SMART</td>
</tr>
<tr>
<td>22-32% more students mature with SMART</td>
<td>500-750% more words are read by SMART classes.</td>
</tr>
<tr>
<td>500-750% more words are read by SMART classes.</td>
<td>250-450% higher median in SMART classes.</td>
</tr>
<tr>
<td>250-450% higher median in SMART classes.</td>
<td>8-20% higher medians in SMART classes.</td>
</tr>
<tr>
<td>(Palmer, 2002, p. 25)</td>
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These comparisons taken from the 2000-2001 Summary Report by Palmer in 2002, of student maturation in reading and printing measures are evidence that SMART kindergarten classes substantially increase performance of students in comparison to the control classes. Some of the most impressive results of the SMART program occur in first grade because students engage in highly sequential curriculum and can often proceed independently once they have mastered basic facts. Simple SMART readiness
stimulation can provide visual and listening maturity after kindergarten for those students who are in need of a boost in development. A comparison of medians was also offered on first graders, transition first graders and on second graders studied by the MLRC staff in 2000 and 2001, see Appendix F for first grade results. Factors that seem to affect or contribute to changes in data are factors such as half-day to all-day kindergarten and teacher effectiveness and enthusiasm for the program (Palmer, 2002).

Two separate studies by Palmer, Proffit, and DeBoer (2004) that have been completed at schools using the program found the same results. One school was a rural Wisconsin Title I school and the other was the Huron Public School in South Dakota. The purpose of these studies was to measure student and teacher performance levels and proportions of proficiency of first grade readiness and early literacy following SMART participation. The studies assessed regular students in Title I schools not using the program and low SES students in grades K-3 receiving more than one year of the SMART Program. The students were assessed using reading, printing, auditory discrimination, and oral text accuracy and fluency assessments. In all measures, students using SMART showed high medians compared to that of the control groups in all areas assessed. “The evidence demonstrates that pre-K and kindergarten enrichment through age-appropriate brain stimulation produced readiness and early literacy improvement for large proportions of students to normal and superior levels in this Title I population” (Palmer, Proffit, & DeBoer, 2004, p. 5).

Research shows that SMART students have an excellent start in school. Teachers are enthusiastic about the positive effects of the SMART program on children, especially students who are considered at high risk for school failure. Research also shows that
students, especially from lower socioeconomic status, are at a higher risk. SMART gives increased hope that all students can experience the benefits of a strong start in school (Palmer, 2002).

The following chapter will describe the methodology used to develop the product found in Chapter IV.
Working as a school occupational therapist for the past four years, my interest has grown in the area of school readiness skills. The number of young children that get referred for Developmental Delay, or fine and gross motor problems has been on the increase. Also, in discussions with primary grade teachers, they have also expressed concern over the growing number of children not prepared for school. The schools where I work are Title I schools, which means that many children that enter school are from families that fall below the poverty threshold; the literature reviewed in Chapter II addresses factors that contribute to these children demonstrating poorer skills than their peers.

I was involved with the SMART Program in three schools I serve, and was able to experience first hand the benefits the program and its concepts had on young children just entering school. The program further sparked my interest when it seemed to be so closely related to OT; its theoretical foundation and its concepts and activities seemed to mirror OT practice research and literature.

The primary Methodology for this project was a review of current literature, the focus was on looking at studies that addressed a variety of factors that influenced or described school readiness. The literature and research reviewed included: descriptions of education curriculums past and present, characteristics and trends of the changing
population, child development and how children learn, factors affecting school readiness skills, and what is being implemented currently to close school readiness gaps. These specific reviews helped to develop a literature base that gave a good overall picture of school readiness issues. Research and literature that described data and characteristics of the SMART Program was also included in the review to provide a solid evidence base to the program.

Other methods used in developing this project included conversations with teachers and other school professionals discussing the trends they are seeing and the concerns over school readiness issues they have firsthand. Part of the methodology process included gathering information and data through discussions via email and phone with SMART founders, including Dr. Lyelle Palmer and Nancy Farnham the MLRC Director. These methods provided further background and data on using the SMART Program. As part of the product development process, I obtained permission to incorporate OT into the SMART Program (See Appendix G). In a conversation with Nancy Farnham, on the similarities between the SMART Program and OT, she stated, “SMART seems to take OT intervention and use it with actual classrooms.” (February 15th, 2006).

My experience in working with teachers using the program and actually assisting with implementation and use of the program also provided foundational information that was incorporated in the product development. This experience helped open communication with teachers actually using the program. Teachers comments about the program include, “The program helps all the children, but specifically targets the children that do not exhibit the same level of skill as their peers,” “The program benefits these
children the most and gives them a chance to catch up before they really fall behind or struggle through what is expected of them,” and teachers state, “The program reaps many benefits by putting the “fun” back into learning and that the children develop and strengthen skills needed to be successful in school” (Personal Notes, 2004-2005).

The following chapter contains the product of this project in its entirety.
CHAPTER FOUR

PRODUCT

It is an amazing coincidence how closely SMART’s (A Chance To Grow Program [ACTG], 2005) foundation and core beliefs mirror those of OT. The Occupational Adaptation Model (Schkade & Schultz, 2003) like SMART takes a look at the person, in this case the student, and the environment (human and nonhuman) and how they interact to promote change. The particular student in this case is the rural Title I student that enters school with a higher chance of coming from a more difficult family situation, usually in a low income bracket. The student, as stated before, has a higher chance of demonstrating poor readiness skills due to the family environment in which they developed. When entering school, this group of students often demonstrate lower fine and gross motor skills, poor visual perceptual skills, poor listening skills, and they are not developmentally ready for formal learning. The Occupational Adaptation Model takes this into consideration when a remedial plan is developed for a student.

Interessingly enough, SMART was developed for students that demonstrated a lack of these skills and those that need more assistance in school upon entry. The SMART program makes sense and should be an integral part of a school’s occupational therapist’s intervention strategies in the school setting.

The Occupational Adaptation Model also looks at the occupation, being a student; and the meaningful activities that must be completed to be successful in the classroom.
(Schkade & Schultz, 2003). SMART promotes increasing readiness skills to increase student success (Palmer, 2002). It makes learning more developmentally appropriate by making it fun and active while at the same time facilitating skill development; this makes learning more meaningful to the child. The SMART philosophy seems to parallel occupational therapy theory, and the activities and skill development within SMART mirror the components and intervention strategies within OT. It is a program designed to involve all children by addressing skills needed for learning and success including motor, visual, and auditory skills. It increases the child’s ability to learn by looking at the “whole person” and promoting future school success. The program incorporates a curriculum that is integrated into the school day and its activities are specific to increase certain skills thus promoting academic success.

As a school occupational therapist, I have been fortunate enough to become involved in the SMART Program. Due to the similarities and the parallels between the program and our profession, my co-workers and I have become an integral part of the program in the schools where we work. Over the past four years, we have been involved in implementing and setting up the program, troubleshooting, adapting activities, and intervening to support correct carry through of the activities. I have also been involved in pooling several more activities together, generalizing the SMART concepts with OT concepts into the classroom, answering questions regarding terms and types of activities used and promoting the program to other teachers and occupational therapists not currently using the program. Because of this involvement by occupational therapists, over the past four years, there seems to be need to define the role of OT in using this program.
The purpose of this product is a protocol to promote occupational therapy as a component of the implementation of the SMART Program. It is set-up with 10 module pamphlets for occupational therapists to use to facilitate their involvement with the SMART Program. The design of the product is a protocol made up of 10 modules/booklets. The following is a listing of the 10 modules that make up *Giving All Children a Good Start to School: A Protocol for Defining Occupational Therapist’s Role in School Readiness, Specifically in Using the SMART Program*.

Modules:

1. Occupational Therapy and the SMART Program.
2. What is School Readiness? A guide for teachers, administrators, parents and health professionals.
3. What can Parents do and What Skills Does Your Child Need upon Entrance to School?
5. Tips for Administrators and Teachers: What Your Occupational Therapist Can Do for you in Using Programs like SMART.
7. How Can the Concepts of SMART be used in the Classroom: An Occupational Therapy Perspective.
8. Protocol to Refer a Child for an Occupational Therapy Screening when using the SMART Program.
9. A SMARTer Way to Learn: Promoting the SMART Program in Schools to Teachers and Administrators.

The protocol development was based on the literature review, discussion with teachers, SMART Founders, and in using the program personally as an OT. The project has been improved by the Director, Nancy Farnham, of the MLRC where the SMART Program is based, and the product developed is supported through her approval (See Appendix F).
Giving All Children a Good Start to School

A Protocol for
Occupational Therapy Involvement
in the SMART Program

Melissa Boll, OTR

Gail Bass, Ph.D., OTR/L, Advisor
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Module I

Occupational Therapy and the SMART Program:
Occupational Therapy and the SMART Program

As a school occupational therapist that encountered the SMART program and assisted with implementing it in two schools, it seemed ideal that occupational therapy (OT) interact with the SMART Program because they seem to fit together; both implement activities and strategies to improve skills students need for learning. This module will describe these similarities in more detail. The purpose of this module is to describe how occupational therapy can be an integral part of the program.

Theoretical Foundation:
One of the key founders, Dr. Lyelle Palmer based the development of the SMART program on the latest new understanding of the brain’s connection to learning and how the brain works. He has researched the development of the brain and how stimulation affects learning. His main points in developing this program were based on information that the brain grows fastest during the early years and the greatest opportunity for influencing brain changes occurs during the earliest years. In response to identifying neurological and physiological readiness gaps he developed a program that stimulates high levels of pre-academic and early academic development skills among all children (Palmer, 2002).

The SMART program focuses on catching up students that enter with skills that are “under” those of their peers. Palmer and his colleagues have found that children, especially those growing up in poverty lack the skills needed to progress at the same rate as their peers due to environment factors they grew up in. SMART provides the stimulation needed to close these gaps (Palmer, 2002).

The founders of occupational therapy have also based their development theoretical foundation on an understanding of how the brain works and on child development. Developmental theorists like Piaget have had significant influence on the foundation of occupational therapy (Piaget, 1981). Developmental theory in OT demonstrates a deep understanding of brain plasticity and how the environment influences development (AOTA, 2002). The OT theoretical base uses the Occupational Adaptation Model by Schkade and Schultz (2003), which seems to promote the same goals as the SMART program in that it looks at school readiness skills by taking an approach to intervention that is holistic when looking at the child, the environment, and the skill levels of the child; and how this all affects their role as a student (Schkade & Schultz, 2003).

How it works:
SMART was created as a multi-sensory approach towards gaining skills needed to excel in the classroom based on using developmentally age appropriate activities to increase the foundational skills that influences a child’s ability to learn, think, and remember. It bases its success on three factors: 1. Frequency of the repetition of multi-sensory input of material, 2. Intensity of participating and actively involved students, and 3. Duration in consistent amount of time spent in the program. It gets back to age-appropriate
learning and incorporates what motivates a child bringing back meaningful learning to fulfill a child’s role as a student (Palmer, 2002).

OT also uses a multi-sensory approach in planning intervention to improve a child’s skills and abilities. It focuses on the occupation of the child and what is meaningful and motivating to the child by using purposeful activities to gain skills. The therapeutic approach OT uses in working with children tends to replicate “play.” Age-appropriate activities are used to keep the child motivated and interested in therapy to gain skills (Case-Smith, 2000). OT also incorporates being active in doing “hands-on” activities to improve the occupation of a child as a student, this mirrors activities of the SMART program (Howes, 1989).

**Skill Components:**
The SMART program looks at skill components that are developed as a child grows, according to A Chance to Grow; the program that SMART was developed under. The skills provide a strong foundation for being able to perform formal learning tasks such as reading. SMART focuses on building the foundation by performing activities that incorporate using balance, gross motor, fine motor, bilateral coordination, visual acuity, eye movements, eye teaming, accommodation, laterality and directionality, visual-analysis skills, visual motor integration, and auditory visual integration skills (MLRC, 2005).

OT follows a practice framework called *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2002), that is unique to the profession and emphasizes supporting function and performance, and the factors that influence success in our occupations or roles. Occupational therapist work with children to help them build the skills to be as successful as they can be at being a student. The OT framework describes the performance skills that an individual needs to carry out or be successful at the tasks needed to fulfill the occupation, in this case being a student. These skills include: motor skills (posture, mobility, coordination, strength, effort, and energy), process skills (energy, knowledge, temporal organization, and adaptation), and communication/interaction skills (physicality, information exchange, and relations) (AOTA, 2002). These skills parallel those that are addressed by the SMART Program.

**Activities:**
The SMART Curriculum Guide includes suggestions on how to use the manual and it includes a statement that specific activities are usually programmed with the aid of trained professionals such as Developmental Optometrist, Neurotechnology specialists, Occupational Therapists, audiologists and speech language pathologists. It is noted in this guide that this ensures the proper diagnosis for those students whose evaluation results are deficient (Palmer, 2002)

The SMART program uses a multi-sensory approach to gain readiness skills that would mirror that of an OT sensory program used in intervention. SMART activities include bouncing balls, spinning, reciprocal movement in creeping activities, swinging, brachiation, hopping, balance beam, trampoline, scooter activities, rolling, tracing,
tracking, and performing strength and endurance activities to build specific skills needed to perform school tasks (See Appendix for sample activities). OT sensory programs and many intervention activities are coincidentally similar; occupational therapists are trained in using these activities to promote skill building with different dysfunctions or delays seen in children in the school setting (Dunn, 1990).

**Environment**
The SMART program uses an obstacle course for completion of the activities and its concepts can be generalized into the classroom. The concept behind the program is that it also offers another learning style that may “fit” certain individuals better than being in a classroom. Many children that seem to have attention problem, no longer have problems learning in this setting. SMART promotes learning actively versus passively by providing more input and less output in accelerating maturity through readiness training (Palmer, 2002).

Pediatric occupational therapists are trained to look at the whole person and all factors contributing to dysfunction, including environmental factors (AOTA, 2002). For a child that does have sensory problems a stimulating classroom may not be ideal; and a child with attention problems may just be a more active learner. OT focuses on the learning environment and therapists are trained to remove or add stimuli that will promote learning.

These are a few of the areas that the SMART program and OT have in common. The SMART program is an asset to school OT and OT’s can be a vital asset to the SMART program.

**References:**


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Module II

WHAT IS SCHOOL READINESS?
A guide for teachers, administrators, parents and health professionals.
WHAT IS SCHOOL READINESS?
A guide for teachers, administrators, parents and health professionals

What does school readiness mean?

According to the National Education Goals Panel (1997), school readiness means: (1) children’s readiness to enter school; (2) schools’ readiness for children, and (3) family and community supports that contribute to the readiness of children.

1. A child’s school readiness is the culmination of the experiences and care that he/she has received from birth to school entry. There are five dimensions to a child’s school readiness:
   • physical health, well-being and motor development;
   • social and emotional development;
   • approaches to learning;
   • language and literacy development; and
   • cognition and general knowledge.
   (Bowman & Wallace, 1989)

Affecting the child’s readiness are the environment, context and conditions in which the child learns and acquires skills (Bowman & Wallace, 1989). The adults in a young child’s life shape these factors.

• Parents will always be their children’s first and most important teachers, caregivers and decision makers. But in a national survey conducted in 2000, only one-third of parents felt “very prepared” for parenthood (Child Trends DataBank, 2005)

• High-quality early education and care are essential for school readiness. “Nearly 70 percent of children under age five are in some form of early care and education setting on a regular basis,” states the Minnesota Department of Education (2004, p. 37). In early learning settings, high quality includes nurturing and well-trained teachers and caregivers, an enriching learning environment, age-appropriate materials, low staff turnover, and low staff/child ratios (National Education Goals Panel [NEG], 1997). But for many families today, high quality care is not accessible or affordable.

2. “Ready schools” are prepared to support the learning and development of every child in their community. Ready schools are characterized by: (a) helping smooth the transition between home and school; (b) strive for continuity between early care and education programs and elementary schools; (c) help children learn and make sense of their complex and exciting world; (d) are committed to the success of every child; (e) are committed to the success of every teacher and every adult who interacts with children during the school day; (f) introduce or expand approaches that have been shown to raise achievement; (g) are learning organizations that alter practices and programs if they do not benefit children; (h) serve children in communities; (i) take responsibility for results; and (j) have strong leadership (Minnesota Department of Education [MDE], 2004, pp. 40-42).
3. **Family and community supports** that contribute to school readiness include:

- Information and support for parents to help them raise healthy children who are ready to achieve their full potential;
- High-quality, culturally competent and developmentally appropriate childcare and early education programs that help prepare children for school;
- The nutrition, health care and physical activity children need to arrive at school with healthy minds and bodies.
- A comprehensive system of developmental assessment, and access to effective early interventions;
- Family economic resources; and
- Strong, safe neighborhoods.

*(NEGP, 1997)*

**Why is it urgent and important to address school readiness?**

- **A need for all children:** As the chief for the Child Development and Behavior Branch of the National Institutes of Health has explained: “Ensuring that all of our children are cognitively, socially, emotionally, and physically ready for school respects no economic, racial, or ethnic boundaries” *(MDE, 2004, p. 30).*

- **Begins at birth:** New scientific research has told us that children’s brains develop faster than we ever imagined. “Ninety percent of the brain’s architecture is formed in the first five years of life” *(Palmer, 2002, p. 2).* And the reverse also seems to be the case. Either way, nurturing and early experiences shape a child’s ability to learn and relate to others for the rest of his or her life *(Palmer, 2002).*

- **Learning environments:** Children learn in the context of relationships. They learn most effectively:
  - when they have warm and secure relationships with parents and other caring adults.
  - through play—alone and with peers.
  - through their interactions with other children and adults; and
  - in environments that are rich in language stimulation and where they can explore engaging materials.

Our new knowledge calls upon all adults to be more children from infancy on, and the kinds of play and learning environments we provide for them *(MDE, 2004).*

- **High Percentage have trouble:** National research shows that nearly 50 percent of entering kindergartners experience moderate to serious problems in making the transition to kindergarten *(Ad Council, 2004).* A Minnesota Survey by the Minnesota Department of Education in 2004 assessed over 3,000 kindergartners upon entrance and found that over 75% demonstrated “not ready” skills in physical motor, literacy, and language development *(MDE, 2004).* In talking with teachers and from being in classrooms, this seems consistent with local school districts.
• **Readiness/Achievement Gap:**
Children who are behind when they start school are unlikely to catch-up. The gap in achievement grows as these children continue in school (Child Trends DataBank, 2005).

• **Lifetime Effects:** Children who are ready to be successful students tend to do better in school and in life. Children whose early experiences- at home and in care settings- nurture and support their learning and development are less likely to fail or repeat grades, be placed in special education, or drop out of school entirely- with significant consequences for their future (Bowman, 1999).

**Factors effecting school readiness:**
There are four critical factors influencing a child’s development: the child, the family environment, child-care and early childhood teachers and the neighborhood and community. Children living in low socioeconomic environments where their parent has low education levels are important factors effecting skills in children. Improving school readiness requires the concerted action of these individuals and groups plus schools, all working together (NEGP, 1997). Connections among the home, early learning settings, school and community create a critical continuity of experience that smoothes the path into school for young children and their families (MDE, 2005).

**Working together for school readiness:**
The need to work together for school readiness is becoming clearer to more and more people. Schools are interested. Childcare and early learning teachers are interested. Parents are interested, and other health professionals are interested such as your school occupational therapists. “Today, most Americans say that raising children is the responsibility of the parents with support from the community… including people in the neighborhood, places of work, schools, and communities” (Ad Council, 2004).

**The new response to school readiness:**
A program developed in response to the new trends in the population, what research is finding in effecting school readiness skills, and what is being found to remediate these school readiness problems upon entrance to school, A Chance to Grow, A New Visions School in Minneapolis along with Dr. Lyelle Palmer have founded the SMART Program (Stimulating Maturity through Accelerated Readiness Training). The program is in response to the latest brain research in that young children’s brain’s can be affected by stimulation. The program was designed to develop and enhance the physical readiness skills necessary for children to have successful experiences in school. The curriculum is a multi-sensory approach to learning. The teachers implement the program into their daily curriculum after training and support. The activities consist of visual perceptual skills and fine and gross motor skills. The program is demonstrating significant results in increasing skills needed for formal learning. To learn more access www.themlr.org website.

Many of our children are entering school today without the physical readiness skills necessary to perform expected school tasks. They are not developmentally ready for school therefore it is the job of the educators and other school professionals to develop these readiness skills to allow for optimal school success (ACTG, 2005).
References:


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Module III

What can Parents do and What Skills Does Your Child Need Upon Entrance to School?


KINDERGARTEN READINESS

Your child will experience greater success in kindergarten if he or she enters school with the skills listed below. The single most critical element to your child’s success throughout all his or her years in school will be if he or she is ready to learn. Students should be interested and motivated and realize that they are going to school to learn. Many children when they start school in September simply do not understand this concept. It will be most helpful if you as interested and involved parents help them realize that they need to listen, pay attention, and remember what they are practicing in school. Parents are their children’s first and most important teachers.

Skills your child should have on entering school:

1. Ability to dress themselves (snap, zip, tuck in shirt, buckle belt). These skills are very helpful for children going to the bathroom independently.

2. Ability to write name, using capital only at the beginning, along with knowing the letters in their first name.

3. Ability to take turns and share.

4. Ability to tie their shoes.

5. Ability to identify and name most of the 52 letters (upper and lower case).

6. Ability to identify their colors and basic shapes (circle, square, triangle, rectangle).

7. Experience using crayons, scissors, and glue. Can cut straight, wavy and a curly line.

8. Ability to listen, do, and stay focused for a period of ten minutes.

9. Some basic concepts of print such as text is read from top to bottom and left to right. These skills can be learned by being read to at home.

10. Experience with group situations through pre-school, daycare, library groups, etc. Displays respect towards others.

11. Ability to count to 20, identifies at least numbers 1-5.

12. Ability to sing basic songs such as the alphabet.

13. Ability to run, hop, jump, catch and throw.

Listing Adapted From:
Module IV

The Benefits of SMART: An Occupational Therapy Perspective
The Benefits of SMART: an Occupational Therapy Perspective

There are numerous benefits to using the SMART program. The SMART program has strong connections in school occupational therapy methods and theory. The following is a list of the numerous benefits the SMART Program provides to closing school readiness gaps and how OT can be involved in using the program.

Benefits of the SMART program are innumerable: Here is a partial list:

The following list is taken from A Chance To Grow (2005), MLRC (2005), Palmer (2002) and actual teacher reports, and personal experience in using the program.

• "It is motivating and enjoyable, which is not insignificant. A relaxed happy child is more excited to learn, is more willing to take risks, and is more cooperative. It is exciting and challenging, according to A Chance To Grow; the program that developed SMART.

• Teachers and children love it. It is putting the “fun” back into learning and teaching (A Chance To Grow, 2005).

• It is age and developmentally appropriate and the curriculum is based on developing school readiness skills needed for formal learning.

• It works on the foundation needed for reading, writing, and mathematics. It builds skills in motor, visual, and perceptual abilities to enable a child to print and read in the classroom.

• It makes sense to incorporate it into the curriculum and classroom due the developmental approach to learning.

• It provides an atmosphere for all children to learn at their own pace and skill level. It also provides an atmosphere for developing different learning styles.

• It is a nice “preventative” health program because fewer children are referred to special services (MLRC, 2005).

• It aids in assessment and diagnosis of skills and performance for other professionals such as occupational therapy (OT).

• It is a valuable tool or program to the profession of OT because it mirrors the Occupational Therapy Framework: Domain and Process (AOTA, 2002) in its terminology, implementation, and in its founding basis by providing all children with the skills needed for success in school performance.

• OT staff can be used as a resource to implement the program and in troubleshooting. OT can also help modify and adapt activities to improve skills in all children.
• Five and six year olds who have taken part in the program have shown significant improvements compared to their peers not using it (Palmer, 2002).

• Students using the program have increased reading levels in kindergarten by 500% or more in some cases (Palmer, 2002).

• Overall research and findings of the increased skills in children is significant (Palmer, 2002).

• It aids physical well-being, promoting children being active not passive in learning. There has been a 70% increase in overweight children within the last 12 years according to a report from the Centers for Disease Control in 1999 in the Journal of the American Medical Association (MLRC, 2005).

• The activities allow children to let off steam and be developmentally appropriate. Studies prove that active learning, learning by doing, or using hands on learning helps children learn age-appropriately and proves to increase retention, recall, and memory in recall versus learning passively (Case-Smith, 2000).

• Lastly and most importantly, it provides pre-academic skill development. There is mounting evidence that motor development is a major force in a child’s academic, social, and personal development. Howes (1989, p.478) used findings from Jean Ayres, founder of sensory integration therapy:

  The brains mental and social functions are based on a foundation of sensory –motor processes. The sensory integration that occurs in moving, talking, and playing is the groundwork for the more complex sensory integration that is necessary for reading, writing and good behavior (Ayres, 1979, p. 478).

Ayres also added, that motor activity is valuable because it provides the sensory input that help to organize the learning process and most teachers have known this for years; the child who has motor problems has many other problems in the classroom.

• SMART is proving to be significant in closing school readiness gaps and the program is currently being replicated by over 20 schools in Minnesota and it is growing nationally.
References:


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Module V

Tips for Administrators and Teachers: What Your Occupational Therapist Can Do for You in Using Programs like SMART
Tips for Administrators and Teachers: What Your Occupational Therapist Can Do for You in Using Programs like SMART

“What else can my occupational therapist or occupational therapy assistant do for me?” Occupational therapy helps individuals engage in everyday activities, or “occupations.” The role of school-based services is to support student learning and appropriate behavior that leads to student achievement and school success. In addition to working directly with students, occupational therapists and occupational therapy assistants also collaborate with teachers, administrators, and parents on development skills and school readiness skills in the following ways:

Consultation Services in using the SMART Program:
Occupational therapy practitioners consult with the teachers to assist in creating adapting, modifying or developing a child’s skills. For instance, by using the SMART program, a therapist may collaborate with teachers to:

- Set-up and implement the multisensory program
- Sequence and grade activities
- Assist with description and good carry-out of activities in terms of body mechanics and ergonomics
- Identify age appropriate activities to improve student learning and behavior
- Assist teachers to establish routines and activities that fit students’ needs
- Identify effective prompts and cues to reduce inappropriate behaviors
- Suggest effective handwriting activities and techniques
- Assist with implementation of activities that involve improving skills in fine and gross motor, coordination, strength, endurance, vestibular, proprioception, balance, visual integration, and all other activities used to improve school readiness skills
- Can be used as a resource for trouble-shooting and support

Early Intervention Services and Supports:
Occupational therapy practitioners promote a variety of experiences that can benefit all students, not just those with disabilities, and therapists may assist in early identification and prevention of difficulties by:

- Adapting and organizing activities for all learners
- Providing handwriting techniques and strategies
- Providing proper body positioning during activities
- Providing social skills/problem solving/coping skills

Assistance with Classroom Modifications using SMART Concepts:
Occupational therapy practitioners know how to adapt environments and materials so they are more accessible to students. Some examples include:

- Helping organize classrooms for optimal student participation
- Designing classroom environments that promote attention and decrease sensory distractions
- Helping organize a students desk and materials
- Implementing activities from SMART into the classroom
✓ Designing learning activities that facilitate participation and promote a variety of movement and sensory experiences
✓ Developing activities to promote school readiness skills when working on school tasks
✓ Assisting teachers in choosing age-appropriate materials and adapting them to increase learning skills
✓ Assisting in working on the skill components during class to
✓ Promote increased attention, motivation, and memory skills
✓ Assisting with age-appropriate curriculum and instruction
✓ Being a resource for questions regarding development and skill building

Your occupational therapist’s knowledge and expertise can be utilized to ensure students’ successful participation in school activities and routines. Talk to your school’s occupational therapist and occupational therapy assistant today to learn more about what they can do for you.

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Module VI

Information to Teachers on How Your School Occupational Therapist Can Help You in Using the SMART Program
Information to Teachers on How Your School Occupational Therapist Can Help You in Using the SMART Program

Your school occupational therapist’s unique expertise is to help children prepare for and perform important learning and developmental activities in the areas of motor, visual, and perceptual skills. In the school setting, Occupational therapists support the achievement of developmental and learning outcomes for children by facilitating social skill development, motor development, emergent literacy and the development of adaptive skills. Occupational therapists are specifically skilled in helping children access curricular activities by contributing to the design and planning of activities, including any needed accommodations or modifications. When using the SMART program occupational therapists can be a significant resource in the following ways.

In Setting –up the Program, Your School Occupational Therapist can:

→ Assist with activity analysis and sequence
→ Accessing space for the program
→ Design the layout of activities
→ Fabricate or create activity materials
→ Locate items required for program
→ Answer questions in regards to understanding program based on extensive training and expertise in activity analysis and terminology

Consult or Support, Your School OT can:

→ Provide trained assessment of activity performance or skill level of a child
→ Assess problem- areas or signs that a child is exhibiting struggles in motor, visual, or skill performance beyond that what is considered normal
→ Provide support in assessing correct body positioning during activity, for example during a log roll vs. a segmented roll
→ Can provide further research or assessment of the program comparing children using it vs. children not using it
→ Adapt and modify activities to use within the classroom
→ Help put the concepts of SMART to work in the classroom to promote skill building and school readiness skills for school success

The expertise your school occupational therapist has in skill building can help address school readiness gaps and this is where occupational therapist can be an important component in implementation of the SMART Program. Ask your OT for support and get them involved today.

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Module VII

How Can the Concepts of SMART be used in the Classroom:
An Occupational Therapy Perspective
How Can the Concepts of SMART be used in the Classroom: An Occupational Therapy Perspective

Many of the activities or concepts from the SMART program can be integrated into the classroom curriculum or learning instruction. The program promotes age-appropriate learning principles such as physical activity, play, and learning using a variety of mediums. The SMART program also uses activities that promote skill building in improving school readiness in young children preschool through second grade. The following provides a resource on how to use the same SMART concepts in the classroom.

**Strategies to Work on Fine Motor Coordination:**
- Purchase pencil grips for proper pencil posture
- Place cushion under child’s writing surface to provide feedback on proper pencil pressure
- Take writing breaks to exercise wrist and fingers
- Use tracing, airbrush, and finger tracing techniques before reproducing shapes, letters, or numbers
- Use different writing positions such as taping assignment on wall or chalkboard or let them lay on the floor with arms resting flat. Slanted work area works well

**Strategies for Working on Gross Motor Coordination:**
- Take breaks to perform big movements by desk such as jumping jacks or cross over to touch toes
- During breaks perform chair push-ups
- Perform balance activities beside desk
- Have them catch a ball to be called upon to answer a question (child sitting on desk helps)

**Strategies for Working on Visual Motor Integration:**
- Slanted work area to copy from board to desk
- Use bigger print or darker print or lines
- Picking out letters or numbers from word searches, rainbow tracing and other eye-hand coordination

**Strategies for Working on Attention:**
- Decrease room stimuli on desk and walls
- Reduce time required in the desk- more active learning
- Allow child to stand or lie next to desk
- Incorporate different teaching styles for different learners
- Take frequent breaks to do some kind of physical activity at or besides desk
- Incorporate age-appropriate learning strategies that replicate “play” or hands-on learning
- Use a variety of teaching mediums such as when learning to print; perform air brushing, finger tracing, and then pencil- paper
- Learn actively- play catch and experiment
**Strategies to Work on Hyperactivity in the Classroom**

- Do spinning, hopping or jumping beside the desk to help children calm down. Once done, children come back to task calmer (ACTG, 2005)
- Reduce time required in desk
- Have the child manipulate an object in their hand (ball)

Many of the SMART activities or the concepts can be woven into the classroom. Your school occupational therapist can assist with adapting the activities and using them in the classroom. Your school occupational therapist has expertise in improving all children’s skills in the classroom and in providing activities that help build skills for successful participation in school.

**References:**


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Module VIII

Protocol to Refer a Child for an Occupational Therapy Screening when Using the SMART Program
Protocol to Refer a Child for an Occupational Therapy Screening when Using the SMART Program

School Occupational therapists provide support for students with specific physical, sensory, and/or learning disabilities. This is to enable them to access their school curriculum as independently as possible and participate to their full capacity in school activities. School occupational therapists primarily work with students who have moderate to severe physical and intellectual disabilities. These disabilities may be the result of illness, injury or developmental delay. Occupational therapists may also give indirect support to students who have difficulty participating in school tasks. Signs of problems can appear during participation in programs such as SMART; the program incorporates all skills needed in order to be successful in school. Children that present signs of poor school readiness skills may need further support from your school occupational therapist in performing motor, visual, visual, and other performance components that effect their ability to learn. While using the SMART program teachers can pick up on these difficulties. The following is a quick protocol of signs that are indicators that your school occupational therapist should be involved.

Vestibular (balance):
- Child is afraid of swings
- Child has excessive need for fast movement activities (rocking)
- Highly distractible

Fine Motor
- No interest in fine motor skills
- Uses a gross pencil grasp
- Poor scissor skills
- Clumsy grasp and release skills
- Difficulty holding small objects or manipulating tools, pencils, or scissors
- Unable to complete mazes
- Difficulty copying from a distance

Gross Motor
- Flinching or other maladaptive response in catching a ball
- Fear response to gross motor activities
- Level of avoidance or motivation to gross motor activities
- Unable to hop, jump, or run
- Difficulty coordinating both sides of the body
- Poor reciprocal movements
- Overall clumsiness or poor coordination of body parts

Visual Integration:
- Poor copying skills
- Poor organization on paper
- Unable to interpret what is written from a distance onto paper
- Poor scanning, focusing, or picking out objects from similar shaped objects
- Poor eye contact

Attention
- Unable to attend for 3-5 minute intervals
- Poor memory or recall
- Poor sequencing or ability to perform step-by-step directions

Organization
- Disorganized or easily frustrated
- Poor ability to fit in with peers
- Takes a long time to perform activities
- Lack of peer interaction
- Poor body language

Cognitive
- Poor orientation- of self or in doing things like puzzles
- Highly distractible or inattentive
- Unable to follow instructions
**A child often presents with more than one of these signs. They should be referred to your Special Education Teacher and then she can refer to the school occupational therapist for screening.

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Module IX

A SMARTer way to Learn
Promoting the SMART Program in Schools: To Teachers and Administrators
A SMARTer way to Learn
Promoting the SMART Program in Schools: To Teachers and Administrators

A classroom teacher flips on the tunes — Little Eva’s rendition of “Locomotion” or “Who Let the Dogs Out” by Baha Men and away they go. Then they perform the turtle or seal, in which students lay on their stomachs and raise their heads while looking in different directions. They use creep tracks that have them move from side to side while slapping a picture and saying the pictured object out loud. The walls are used to trace figure eights with hands and eyes, and they spin, swing, scoot, roll, jump, and perform monkey bars.

While it appears to be all fun and games, the children are actually prepping themselves to learn. The mix of cross lateral, balance, vestibular, vision, and fine and gross motor skill activities are stimulating the students’ brain stems to promote better connections among neurons and increase capabilities for readiness school development (MLRC, 2000-01). Simply put, using SMART. Stimulated Maturity through Accelerated Readiness Training (SMART).

SMART was created in the 1980’s at a charter school in Minneapolis. It was started in response to parents wanting to give their children a better start to school. It is now being replicated in over 30 elementary and pre-schools in the state and in over 80 schools nationally. Schools are replicating the program in order to increase children’s readiness skills. The program is based on a new understanding of the brain along with research that supports more needs to be done to better prepare children for success in school (Palmer, 2002). The program is especially beneficial and targets children that are considered “at risk” due to socioeconomic factors.

The program develops physiological and neurological readiness skills essential to students’ success in the classroom. Targeting pre-kindergarten through third grade, it is designed to allow each child to progress at his or her own rate while enhancing the child’s abilities in a playful, positive environment.

Some of the teachers reactions to the program are that children love it and it seems to ground them in developing their skills awareness and finding their place in space. The program activities are inter-related to language development, reading, math, writing, physiological readiness, coordination, and the ability to be attentive. It prepares them to learn.

Children, on average, make a six-month gain in reading after participating in 80 hours of the program in the school year by doing balance/vestibular, gross and fine motor, and visual acuity exercises (MLRC, 2005).

Many children in this generation and the generation before are coming to school unprepared, the stimulation their brains need to learn hasn’t taken place. This is evident not only by what is being seen, but is backed up by significant research on school readiness. Too many children are falling through the cracks and if they are not ready to learn it is setting them up for school failure and failure in life. Therefore, it is our job as educators to help children develop these readiness
skills to allow for optimal school success.

When children enter school, Educators and parents often assume: 1. that children are able to see the print in front of them as a clear, single image. 2. that children have developed fine coordination muscle control in the eyes necessary to follow along and read in a book. 3. that children have naturally or already acquired the large muscle skills necessary to coordinate the fine muscle movements required for cutting, writing, and coloring (Palmer, 2002, p. 2).

The SMART Program Training was developed by Professor Lyelle Palmer, (Professor Special Education) Winona University, Minneapolis, MN.

The SMART Program produces higher levels of pre-academic readiness and early academic achievement by enriching many typical school activities with brain stimulation components. Brain development can be altered either positively or negatively through manipulation of environmental stimuli and experience.

The SMART Program is suitable for preschool to third grade students and for all children who need remedial help regardless of age. It involves physical exercises and desk activities. According to the founders, “The stimulation that results from SMART Program activities increases beneficial electrical activity in brain cells beyond the cultural norm. The stimulation must be more frequent, intense and of a longer duration than what is usually experienced from the environment. This stimulation enhances brain connections and creates a higher standard of brain maturity. Variety and challenge can change the brain” (Palmer, Proffit, & DeBoer, 2004 pp. 2-3)

Several years of SMART Program data show statistically significant superiority of the stimulation group of children in comparison to controls in that portion of the curriculum the teacher chooses to emphasize. The SMART Program is a booster, boosting whatever aspect of the curriculum the teacher champions (Palmer, Proffit, & DeBoer, 2004).

According to the research done by Palmer and his colleagues (2004), five and six-year-olds that have taken part have shown significant improvements, compared to other classmates, in early language and numeracy skills. In addition, to the above finding those children increase their reading level by six months after 80 hours of participation.

In one group of 70 SMART kindergarten children, only one was referred for remedial services when usually a quarter would be; according to one school administrator where the program is currently being implemented.

Based on the research and the need to address school readiness gaps, the program’s activities are being replicated in over 30 schools in Minnesota and over 80 schools nationwide (Palmer, 2002)

The program has many benefits; it is fun, age and developmentally appropriate, teachers love it, and the results are significant in closing the gaps on school readiness. For more information contact the SMART program through their website: www.themlrc.org
References:


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Module X

Promotion Pamphlet for Teachers and Administrators
provide students with a strong start to school through

smart

stimulating maturity through accelerated readiness training

*a program created as a multi-sensory approach towards gaining the readiness skills needed to excel in the classroom

*used for children preschool through second grade.

*children love it and it is a fun approach to learning.

training and curriculum offered by the minnesota learning resource center in minneapolis, minnesota: a chance to grow, a new visions school

many of our children are entering school today without the physical readiness skills necessary to perform expected school tasks. they are not developmentally ready for school and therefore it is the job of the educators to develop these readiness skills to allow optimal success. assumptions of children as they enter into school:

• children see the print in front of them as a clear single image
• children have developed the fine coordinated muscle control in their eyes necessary to follow along and read in a book.
• children naturally acquire or will have already acquired the fine muscle movements required for the fine movements of cutting, writing and coloring.

we as educators, paraprofessionals, volunteers, occupational therapists, and physical therapists need to be able to have handy curriculum for

working with children to develop their readiness skills.

background:
smart (formally called boost-up) is a program that was initially implemented at a chance to grow, a new visions school in minneapolis, mn. it was founded in 1982 by a group of parents looking for a better chance for their disabled children.

characteristics:
a chance to learn curriculum is a multi-sensory approach to learning. it is designed to develop and enhance the physical readiness skills necessary for children to have successful school experiences.

it is being implemented in numerous minnesota preschools and elementary schools and now nationally.

it is proven to increase reading skills significantly, improve fine and gross motor skills, visual and
auditory skills, and overall close school readiness gaps in children early on.
SMART incorporates music, movement, and learning into a more developmentally appropriate curriculum.

Educators and children love it because it is fun and motivating and the benefits are overwhelming.

WHO IS IT FOR:
It is for all educators and all children.
Workshops for elementary classroom teachers, special education teachers, adaptive physical education teachers, occupational therapists, physical therapists, and paraprofessionals is offered through the Minnesota Learning Resource Center (MLRC).

Topics at the workshop include:
1. The physiology of the brain, 2. The impact of stimuli on brain development, and 3. How to assess a child's development and Methods for teaching reading and printing grounded in the physiology of brain development.

EDUCATORS FEEDBACK:
Schools implementing the program have this to say about the program:

It is fun and motivating, children do love it.

They learn quicker, implementing the core concepts of the program right into the classroom.

Children that seem 'clumsy' at the beginning of the year show vast improvement in skills.

Behaviors seen in the classroom seem to disappear during SMART implementation.

It helps address diagnosis or key trouble areas that can be worked on in the classroom.

It is developmentally appropriate for little ones, and as an educator, I see firsthand the benefits they receive.

WORKSHOPS & CONTACT INFO:
Workshops are offered throughout the year.

If interested contact the MLRC:
Call (612)-706-5549 or visit mlrc@actg.org

*Workshops offer contact hours.

Get started on making this a part of your school curriculum and help better prepare children for future school success!!

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APPENDIX
APPENDIX A

Examples of Curriculum Activities
EXAMPLES OF VESTIBULAR ACTIVITIES

Progression of activities under this category include:
1. Log Rolls
2. Spinning
3. Forward Rolls
4. Balance Beam
5. Cartwheels.

1. THE LOG ROLL

Purpose: To develop proprioception and low-level vestibular and visual skills.
Time: 5 minutes
Materials: Open Gym Space on the floor and two gym mats.

Procedure:
1. Teacher models.
2. Have children line up at the end of the mats.
3. Have the children lie flat on the mats.
4. Have children hold their two hands over their head and roll down mats.
5. Begin having the child go slowly so they remain straight and in control,
6. Begin with eyes open and then closed when they seem ready.
7. As skill increases move to rolling with eyes open, then have the child increase speed.
8. Be sure to leave space in between the children for safety.

Note: Rolling with eyes open stimulates the visual system.
Rolling with eyes closed stimulates the vestibular system.
(Some children may need assistance at first with rolling over and keeping their arms and legs straight).

Variations: Have the child pretend he or she is a hotdog or tootsie roll.
2. SPINNING (Helicopters)

Purpose: To develop basic vestibular (balance and visual) skills.
Time: 5 minutes
Materials: Floor Space without obstructions.

Procedure:
1. Teacher models.
2. Have children spread out in room.
3. Have the children check their space to ensure ample room.
4. Have the children spin for 15 seconds with eyes open.
5. After 15 seconds of spinning have the children stop and stand with their eyes closed for 15 seconds.
6. Repeat activity for period of 3-5 minutes.
7. Begin slowly, remind children to stay in control.
8. Work the children up to being able to spin with their eyes closed as will.
9. For children who feel dizzy with their eyes open, let them close their eyes.

Variations:
Add full spectrum music such as Bach or Mozart while the children are spinning with their eyes closed. This increases auditory stimulation.
Have the children pretend they are blenders, making milk shakes, adding ice cream, and etc.
EXAMPLES OF LARGE MUSCLE ACTIVITIES

Progression of these activities include:
1. Crawl
2. Creep
3. Stylized Creep
4. Creep Track
5. Brachiation
6. Cross Pattern Walk
7. Flashlight Walk
8. Bilateral Jumping Jacks

1. CRAWL

Purpose: To develop coordination at the basic level, and integrate both sides of the brain.
Time: Approximately 5 minutes
Materials: Some children prefer long pants, gym mats, carpet, foam, and linoleum may be used.

Procedure:
1. Have children remove shoes and socks for better sensory input.
2. Have children crawl on their stomach across the room using a cross pattern. This involves using the opposite arm and leg simultaneously. For example, a child would move the left arm and right leg and then the right arm and the left leg.
3. Begin crawling on a mat or carpet.
4. Allow children to crawl on other surfaces as well.
5. Crawling can also be done under and around desks and large chairs in an obstacle course.
6. It is recommended that crawling be one of the first activities completed, due to it requires the most effort.
7. You may use occasional reminders for the children to use flat hands rather than fists, but keep in mind this is to an automatic function rather than a conscious cortical function.
5. BRACHIATION (Monkey Bars)

Purpose: To develop chest muscles, eye/hand coordination and increase oxygen intake.

Time: 2-3 minutes

Materials: Overhead ladder secured safely or monkey bars.

Procedure:
1. Have children hang from bar for 15 seconds. Build this time up to one minute.
2. Have children swing form rung to rung while visually tracking a hand as it moves forward. Make sure children use thumbs while gripping the rungs to hold on better.
EXAMPLES OF FINE MOTOR ACTIVITIES

Progression:
1. Paint Brush Writing
2. Rainbow Tracing
3. Clothespin Activity
4. Tweezers activity
5. Cutting Activities.

1. PAINTBRUSH WRITING:

   Purpose: To develop the fine muscle skills and wrist control for writing.
   Time: 5 minutes.
   Materials: Paintbrush, water, chalkboard, thick paper for painting on, water color for paint.

   Procedure:
   1. Teacher sets up center for writing.
   2. Children use the station dipping the brush into the water and then writing and drawing holding the paintbrush correctly.
   3. The teacher sets up the station with words, shapes, or letters written. The child traces the lines on the chalkboard with a wet brush or use watercolor on paper.
5. CUTTING:

Purpose: To develop the fine muscles skills and wrist control for cutting.
Time: 5 minutes.
Materials: 8X10 sheets of paper with shapes such a square, rectangle, triangle and circle, scissors, and a box for scraps.

Procedure:
1. The child sits at a desk or table with materials laid out in front of him
2. The children are prompted to use the correct positioning to cut- holding paper with non-dominant hand, and cutting with thumb up towards the ceiling.
3. The children complete cutting the shapes in the time allowed.
EYE MOVEMENT ACTIVITIES:

1. MAZES

Purpose: To use smooth eye movements to follow printed lines or paths to a target.
Time: 3-5 minutes
Materials: Wall or desk surface with materials taped to it.

Procedure:

1. Sit or stand at surface to trace or draw line from start to finish.
2. Use good pencil grip and wrist hand movement to correctly complete task.
3. Trace same pattern 3-5 times.
2. COPYING WORDS OR LETTERS FROM WALL

Purpose: Using gross saccades of the eye to shift fixation and movement of the eyes from a large target the wall or chalkboard to print the same material to a piece of paper.

Time: 3-5 Minutes.

Materials: Chalkboard or wall, paper, and writing materials on a surface.

Procedure:

1. Copy appropriate spelling words or letters being learned in a linear sequence from the wall or chalkboard 5-10 feet away from student
2. Use pencil and paper to copy using correct pencil grip and wrist and hand movement
3. Can use simple shapes, letters, or words appropriate to age of child.

Reference:

CHAPTER FIVE

CONCLUSIONS/RECOMMENDATIONS

Summary

“School entry is a major life transition. Its successful accomplishment may have a lasting impact on academic skill, learning incentive, social adjustment, and self-esteem” (Bowman, 1989, pp. 610-611). Based on the review of Literature in Chapter II, researchers are seeing new trends in children that are entering school, including learning more material faster, in some cases due to technology in the home. Children are also more sedentary due to technology and home environments. Families are splitting up, both parents work, children are left alone or are made to care for themselves, and children are just not being attended to as they were in years past. Research is providing evidence that these factors along with low socioeconomic status are major factors in causing more children to enter school with poor school readiness skills in the areas of coordination, gross and fine motor abilities, visual skills, language skills, and pre-learning cognition. Research suggests that these children are not prepared for formal education and we are seeing more developmental delays and learning disabilities diagnosis, more school failure, and more behavioral problems. The majority of the literature suggests that enrichment programs or school curriculum needs to be tailored to these growing trends. One way is to offer a more developmentally appropriate learning curriculum.
Research summarized in Chapter II of this document, substantiates that sensation and movement facilitate language and learning, particularly in the academic setting. Infants learn through movement and from the consequences of their movements. Because of this, motor development has far reaching implications for learning. For the entering kindergartner, the combination of sensorimotor and language tasks duplicates the child’s familiar and natural means for acquiring skills. Typical kindergartners learn most effectively when they use all their senses concomitantly- vision, hearing, touch, movement, and all the others (Case-Smith, 2002). Therefore, using enrichment programs and the concepts of programs like the SMART Program to stimulate a variety of senses in order to improve language, motor, and academic functioning is proving to be a significant asset to education. The activities of SMART also incorporate a number of different concepts that are typical of a child’s natural play experiences (Palmer, 2002).

The SMART Program makes sense. It is promoting the use of developmentally appropriate activities to learn in preschool through third grade, and its concepts can be integrated into any classroom. Research on the SMART program is limited due to its novelty, however the schools and teachers that are implementing the curriculum have found excellent and promising results because children exhibit significant increase in their skills. Based on research reviewed in Chapter II., using movement to facilitate the enhancement of skills needed for school success is key, especially in children from rural low socioeconomic backgrounds. The authors of the SMART Program help all children improve skills needed for academic learning and promotes long-term success in formal academics (Palmer, 2002).
The SMART Program parallels core concepts and theoretical foundations of occupational therapy. Any school occupational therapist would benefit from promoting its implementation because it addresses the very skills occupational therapists address in their intervention programs. SMART seems to mirror the Occupational Adaptation Model (Schkade & Schultz, 2003), in looking at the person, environment, and how the two interact to affect occupational performance to promote successful participation in age-appropriate developmental tasks. The SMART Program includes remediation activities for the very skills that occupational therapists teach and evaluate. Using the SMART Program compliments the work of occupational therapy in the classroom. It promotes preventative measures, evaluation, and enhancing skills for the student to facilitate a good start in school; the program terminology matches the terminology in the *Occupational Therapy Framework: Domain and Process* (AOTA, 2002). Using SMART as a collaborative tool in the school system will help the school occupational therapist meet intervention goals.

Collaborative teaching is a philosophy that is becoming more and more familiar to more professionals everyday. Many schools are requesting that speech-language pathologists and occupational therapists enter the classroom and team-teach with the teacher. The resulting exchange of information between disciplines has had a positive effect on students' learning. Collaboration between speech language pathologists and occupational therapists with the teacher in the classroom has proven very effective (Case-Smith, 2000). The developers of the SMART Program promote using a collaboration network to implement the program and its activities they are designed to be implemented
with the aid of trained professionals, such as Development Optometrists, NeuroTechnologist, Occupational Therapists, and Audiologists (MLRC, 2005).

In today’s classrooms, children often sit in their chairs for six hours each day, passively listening rather than actively learning, and current literature indicates this is not an effective means of teaching. SMART offers an alternative to passive learning; it combines movement to support learning in the areas of reading readiness, printing, math readiness, language and listening.

Product Promotion

Initially, the protocol that was developed for occupational therapists involvement in the SMART Program will be used in the schools I work with and in the surrounding schools in the area. The protocol will also be made available to my co-workers. Secondly, the protocol will be introduced to the MLRC staff in Minneapolis, Minnesota through the director, Nancy Farnham. She is aware of and supports the protocol development. It will be available as a resource at the site.

Recommendations

Continued studies with children, in the area of hands on learning, are needed in the occupational therapy profession. Occupational therapists play a critical role in the provision of educational services, and, as authorized by law, their role in the school system is to provide services that are directly related to helping students meet their educational needs. Learning and retaining new information are primary educational needs, and occupational therapists can play an important role in assisting students and educators to meet these needs One way in which occupational therapist can enhance
student learning is through research on the effectiveness of OT intervention in the schools.

Occupational therapists are already becoming involved in the SMART Program implementation and development in the schools they serve. It is recommended that research on the impact of OT involvement in implementation of the SMART Program be done. It is also recommended that occupational therapists provide consultation for A Chance To Grow, where the SMART Program is programmed, in further development of their SMART Program. Occupational Therapists, like myself, already are beginning to do much needed research on the program in the schools to develop a larger evidence base in promoting its integral part in the K-3 curriculum.

Occupational therapists are not new to remediating school readiness gaps through their involvement in assessment and intervention. OT’s can be a valuable resource in using programs such as the SMART Program and can be a valuable resource in addressing school readiness issues in children at a young age. An occupational therapist can assist with: developmentally age-appropriate curriculum development, techniques that provide skill development in the classroom, increasing a school’s ability to respond to the varying needs of children as they enter kindergarten, adapting teaching strategies to meet the needs of all children, and developing parent and community support in preparing children for school.

The SMART program is hopefully just the beginning in helping children close readiness gaps and preparing them for a successful future in school. The future predictions for this program is exciting. Implementation of the SMART Program and programs like SMART can have an impact on children’s future success in school. These
programs can not only help prevent school failure, they can promote school success to children that seem at risk, children that seem 'clumsy,' and all children no matter their background or skill level. Use of the SMART Program has been shown, through research, to raise reading skills significantly and to further overall skills that will predict later school success. Using this program can be an asset to the profession of occupational therapy, as occupational therapists, it is our job to promote learning that best matches individual learning styles and to provide the most successful experience possible for each student. Occupational therapists, specifically school occupational therapists, can prove to be vital team members in programs such as SMART. Occupational Therapists have training to address skill development; they are trained in the areas of assessment and intervention and are able to do activity analysis and program evaluation.

Involvement in implementation of the SMART Program will allow occupational therapists to have another means to address the school readiness needs of young children through a program that fits easily within the practice of OT.
APPENDIX A

READINESS MODEL
School Readiness

Child Characteristics
- Child Health
- Temperament
  - Prenatal & Neonatal Health

Parental Health
- Physical
- Mental
- Nutrition
- Personal Resources
- Marital or Partner Relationships
- Home Environment & Teaching
- Childbearing Behavior & Attitudes
- Family Processes/Organization
- Child Care Arrangements & Resources

Child Growth & Development
- Health
  - Physical Health
  - Physical Activity
  - Nutrition
  - Gross & Fine Motor
  - Cognitive
  - Language/Communication
  - Socioemotional

SCHOOL READINESS

Readiness Model (West, 2000, p. 8).
APPENDIX B

a. SAMPLE ACTIVITIES FROM CURRICULUM GUIDE

b. OBSTACLE COURSE
EXAMPLES OF VESTIBULAR ACTIVITIES

Progression of activities under this category include:
1. Log Rolls
2. Spinning
3. Forward Rolls
4. Balance Beam
5. Cartwheels.

1. THE LOG ROLL

Purpose: To develop proprioception and low-level vestibular and visual skills.
Time: 5 minutes
Materials: Open Gym Space on the floor and two gym mats.

Procedure:
1. Teacher models.
2. Have children line up at the end of the mats.
3. Have the children lie flat on the mats.
4. Have children hold their two hands over their head and roll down mats.
5. Begin having the child go slowly so they remain straight and in control,
6. Begin with eyes open and then closed when they seem ready.
7. As skill increases move to rolling with eyes open, then have the child increase speed.
8. Be sure to leave space in between the children for safety.

Note: Rolling with eyes open stimulates the visual system.
Rolling with eyes closed stimulates the vestibular system.
(Some children may need assistance at first with rolling over and keeping their arms and legs straight).

Variations: Have the child pretend he or she is a hotdog or tootsie roll.
2. SPINNING (Helicopters)

Purpose: To develop basic vestibular (balance and visual) skills.
Time: 5 minutes
Materials: Floor Space without obstructions.

Procedure:
1. Teacher models.
2. Have children spread out in room.
3. Have the children check their space to ensure ample room.
4. Have the children spin for 15 seconds with eyes open.
5. After 15 seconds of spinning have the children stop and stand with their eyes closed for 15 seconds.
6. Repeat activity for period of 3-5 minutes.
7. Begin slowly, remind children to stay in control.
8. Work the children up to being able to spin with their eyes closed as will.
9. For children who feel dizzy with their eyes open, let them close their eyes.

Variations:
Add full spectrum music such as Bach or Mozart while the children are spinning with their eyes closed. This increases auditory stimulation.
Have the children pretend they are blenders, making milk shakes, adding ice cream, and etc.
EXAMPLES OF LARGE MUSCLE ACTIVITIES

Progression of these activities include:
1. Crawl
2. Creep
3. Stylized Creep
4. Creep Track
5. Brachiation
6. Cross Pattern Walk
7. Flashlight Walk
8. Bilateral Jumping Jacks

1. CRAWL

Purpose: To develop coordination at the basic level, and integrate both sides of the brain.
Time: Approximately 5 minutes
Materials: Some children prefer long pants, gym mats, carpet, foam, and linoleum may be used.

Procedure:
1. Have children remove shoes and socks for better sensory input.
2. Have children crawl on their stomach across the room using a cross pattern. This involves using the opposite arm and leg simultaneously. For example, a child would move the left arm and right leg and then the right arm and the left leg.
3. Begin crawling on a mat or carpet.
4. Allow children to crawl on other surfaces as well.
5. Crawling can also be done under and around desks and large chairs in an obstacle course.
6. It is recommended that crawling be one of the first activities completed, due to it requires the most effort.
7. You may use occasional reminders for the children to use flat hands rather than fists, but keep in mind this is to an automatic function rather than a conscious cortical function.
5. BRACHIATION (Monkey Bars)

Purpose: To develop chest muscles, eye/hand coordination and increase oxygen intake.
Time: 2-3 minutes
Materials: Overhead ladder secured safely or monkey bars.

Procedure:
1. Have children hang from bar for 15 seconds. Build this time up to one minute.
2. Have children swing from rung to rung while visually tracking a hand as it moves forward. Make sure children use thumbs while gripping the rungs to hold on better.
EXAMPLES OF FINE MOTOR ACTIVITIES

Progression:
1. Paint Brush Writing
2. Rainbow Tracing
3. Clothespin Activity
4. Tweezers activity
5. Cutting Activities.

1. PAINTBRUSH WRITING:

Purpose: To develop the fine muscle skills and wrist control for writing.
Time: 5 minutes.
Materials: Paintbrush, water, chalkboard, thick paper for painting on, water color for paint.

Procedure:
1. Teacher sets up center for writing.
2. Children use the station dipping the brush into the water and then writing and drawing holding the paintbrush correctly.
3. The teacher sets up the station with words, shapes, or letters written. The child traces the lines on the chalkboard with a wet brush or use watercolor on paper.
5. CUTTING:

Purpose: To develop the fine muscles skills and wrist control for cutting.
Time: 5 minutes.
Materials: 8X10 sheets of paper with shapes such a square, rectangle, triangle and circle, scissors, and a box for scraps.

Procedure:
1. The child sits at a desk or table with materials laid out in front of him
2. The children are prompted to use the correct positioning to cut- holding paper with non-dominant hand, and cutting with thumb up towards the ceiling.
3. The children complete cutting the shapes in the time allowed.
EYE MOVEMENT ACTIVITIES:

2. MAZES

Purpose: To use smooth eye movements to follow printed lines or paths to a target.
Time: 3-5 minutes
Materials: Wall or desk surface with materials taped to it.

Procedure:

1. Sit or stand at surface to trace or draw line from start to finish.
2. Use good pencil grip and wrist hand movement to correctly complete task.
3. Trace same pattern 3-5 times.
4. COPYING WORDS OR LETTERS FROM WALL

Purpose: Using gross saccades of the eye to shift fixation and movement of the eyes from a large target the wall or chalkboard to print the same material to a piece of paper.

Time: 3-5 Minutes.

Materials: Chalkboard or wall, paper, and writing materials on a surface.

Procedure:

1. Copy appropriate spelling words or letters being learned in a linear sequence from the wall or chalkboard 5-10 feet away from student
2. Use pencil and paper to copy using correct pencil grip and wrist and hand movement
3. Can use simple shapes, letters, or words appropriate to age of child.

Reference:

OBSTACLE COURSE

1. Vision Station (tracing)
2. Reading Station
   While bouncing a ball
3. Crawling, Crab Crawl, etc.
   Reciprocal Movement
4. Log roll
5. Trampoline

6. Rope Swing
7. Somersaults
8. Spinning
9. Balance Beam
10. Scooter push-pull
11. Monkey Bars
# Mobility Evaluation

## CRAWLING

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<td>4 beat</td>
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<td>To head</td>
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## CREEPING

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## WALKING

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GLOSSARY

Accommodation: Focusing; amplitude- being able to maintain a focus at the normal reading distance.

Auditory Visual Integration: The ability to integrate the visual and auditory system.

Balance: Ability to use movements to regain midline position.

Bilateral Coordination: The ability to be aware of and use the body separately and simultaneously.

Eye Movements: Tracking; voluntary or induced movements.

Eye Teaming: Binocular vision; the use of the both eye simultaneously to accurately interpret what is seen.

Fine Motor: Small Muscle movements such as transferring an object from one hand to another, scribbling, or buttoning.

Gross Motor: Large muscle movements such as rolling, crawling, sitting, or walking.

Laterality and directionality: Internal and external spacing awareness such as left, right, up and down.

Phonics: Method of teaching reading by teaching the sounds associated with particular letters or letter combinations.

Title I School: Includes schools offering targeted assistance to low-income children and schools with high rates of low-income children that use Title I funds to support school-wide programs such as meal assistance.

Visual Acuity: Acuteness or clearness of vision.

Visual Analysis Skills: Visual perceptual skills- these skills include recognition, recall and manipulation of visual information.

Visual Motor: The act of using sight to guide the body through the execution of a motor activity.

Visual Motor Integration: The ability to integrate the visual and motor system.

Visual Perception: The meaning or interpretation that the brain gives visual input. (A person can have good vision without having good visual perception.

APPENDIX E

SMART SKILLS
SMART SKILLS

SMART focuses on balance, gross motor, fine motor, bilateral coordination, visual acuity, eye movements, eye teaming, accommodation, laterality and directionality, visual analysis skills, visual motor integration and auditory integration (See Glossary).

The vision of SMART is to build the skills at the foundation of learning to enhance and build school skills for later success. SMART's vision is described by the MLRC and its founders by a pyramid description to help understand that SMART builds on skills at the bottom of the pyramid to build and enhance stronger skills at the top to needed for successful academic learning.

The Vision

- Reading
- School Skills
- Integration
- Vision Analysis
- Visual Spatial skills
- Visual Efficiency
- Gross and Fine Motor
- Balance-Vestibular

SMART builds these skills:

The SMART program focuses on the bottom three layers of the pyramid and specifically works on those skills needed to promote school success. Its founders and the MLRC in the following definitions explain the pyramid:

BALANCE = physical equilibrium; the ability to maintain an upright position without falling over. Examples: sit without support 6-7 months, stand without support 10-14 months, balance on one foot briefly 2 years, hop on one foot 3 years, skipping 4-5 years.
GROSS MOTOR = large muscle movements. Examples: rolling over 4-5 months, crawling and creeping 5-10 months, sitting 6-7 months, pull to standing 9-10 months, walking independently 12-14 months, run 18-24 months, pedal tricycle 3 years, walk up and down stairs alternate feet 3.5-4 years, ride two-wheel bike without training wheels 6-7 years.

FINE MOTOR = small muscle movement. Examples: transfer objects from one hand to another 3-5 months, grasps objects 4-8 months, pincer grasp 10-12 months, throws objects to follow 12-15 months, scribbles 18-24 months, copies circle 3 years, buttons clothes 3.5 years, catches ball, 4-5 years.

BILATERAL COORDINATION = the ability to be aware of and use both sides of the body separately and simultaneously. This is a basic visual spatial skill necessary for normal interaction with the environment. Visual spatial skills are important for the development of good balance, gross motor coordination and directional sense.

VISUAL ACUITY = (under visual efficiency) acuteness or clearness of vision clinically measured with a Snellen or other visual acuity chart. Visual acuity dependent on the sharpness of the retinal focus, the sensitivity of the nervous system and the interpretive faculties of the brain.

EYE MOVEMENTS = (under visual efficiency) tracking; voluntary or induced movements of the eyes.

Using this model, the activities provided in the Curriculum Guide build on these specific areas. Activities from the curriculum are listed in a progression of order they should be performed and mastered. According to the MLRC, in order for a child to receive full benefits of the SMART program, it is recommended that at least 80 hours of “Floor Time” be included in the planning of activities. Floor activities are found in the curriculum guide provided at the training and activities are found grouped under the following categories:

1. Vestibular Activities: involve log rolls, spinning, forward rolls, balance beam, and cartwheels.
2. Large Muscle Activities: are also part of floor time and include crawling, creeping, stylized creeping, brachiation (overhead ladder), cross pattern walking, flashlight walking, bilateral jumping jacks and trampoline.

3. Fine Motor Activities: printing, tracing, cutting, and manipulating small objects.

4. Basic Vision: using a flashlight in a darkened room, reading spelling words while bouncing a ball, performing wall-reading patterns.

Reference:

APPENDIX F

SMART FIRST GRADE RESULTS
SMART First Grade Summary

Comparisons of Median percentages and proportions show an advantage for students in SMART first grade in the following areas:

- Smooth Eye-Hand Coordination: SMART median 11-23% more students mature
- Near Point Visual Convergence: 2.0% more SMART students
- Auditory Discrimination: 20% more students mature
- Manuscript Printing Quality SMART median advantage 15-50%
- Oral Reading Rate: SMART students 42% faster, 27 more wpm
- Oral Reading Fluency-Accuracy: SMART median 97%
- Math Facts per minute: 90% faster calculation
- Math Fact Accuracy: 9% more accurate calculation

Some of the most impressive results of the SMART program occur in first grade due to students engage in higher sequential curriculum and can often proceed independently once they have mastered the basic facts.

Reference:
APPENDIX G

LETTER
March 16, 2006

Melissa Boll
25843 185th Avenue SW
Crookston, MN 56716

Dear Melissa,

This letter is to confirm the fact that you and I have talked about the Scholarly Project on which you are working involving learning readiness and that your project includes information on the S.M.A.R.T. program. With your background as an Occupational Therapist, I appreciate that you understand the importance of the activities we promote and the fact that they can be done systemically in the classroom involving young children in grades Kindergarten through second.

I look forward to receiving feedback from you once your final paper is completed. Thank you very much for sharing the S.M.A.R.T. information through your work and studies.

Nancy Farnham
MLRC Director
References


Case-Smith, J. (2002). Effectiveness of school based occupational therapy intervention on handwriting. The American Journal of Occupational Therapy, 56,17-25


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