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Promoting Fine Motor and Visual-Motor Skill Development in Preschool Age Children

by

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Advisor: Anne M. Haskins, PhD, OTR/L

A Scholarly Project

Submitted to the Occupational Therapy Department

of the

University of North Dakota

In partial fulfillment of the requirements

for the degree of

Master's of Occupational Therapy

Grand Forks, North Dakota



This Scholarly Project, submitted by Patty Soldner 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.

Anne M. Haskins, PhD, OTR/L

5-2-204

Date

PERMISSION

Title

Promoting Fine Motor and Visual-Motor Skill Development in Preschool

Age Children

Department

Occupational Therapy

Degree

Master's of Occupational Therapy

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TABLE OF CONTENTS

ACKN	NOWLEDGEMENTS	iv
ABST	TRACT	v
СНАР	PTERS	
I.	INTRODUCTION	
II.	REVIEW OF LITERATURE Motor Skill Development	
	Occupational Therapy in the Educational Setting	
	Cultural Implications of Development	
	Intervention Approaches	32
III.	METHOD	48
IV.	PRODUCT	51
V.	SUMMARY	54
APPE	NDIX	
REFE	RENCES	

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ABSTRACT

Fine motor skills are important in childhood development (Beilei, Lui, Qu & vonHofsten, 2002; Rosenblum, Weiss & Parush, 2003 as cited in Jackman & Stagnitti, 2007). These skills become critical when a child reaches school age when the child is expected to perform fine motor tasks such as cutting, coloring, and writing as part of his or her daily routine. Research has shown that there is a high rate of fine motor difficulties in school-age children in the United States (Hammerschmidt & Sudsawad, 2004 as cited in Jackman & Stagnitti, 2007). Caregivers of preschool age children often seek the assistance of an occupational therapist to educate them in how they can facilitate a child's ability to perform fine motor tasks successfully.

This scholarly project culminated in a guide, which is intended to provide occupational therapy practitioners, teachers, and parents with the information necessary to educate caregivers of the preschool age population with knowledge of fine and visual-motor development and strategies to use to promote skill development specific to the child's age. This project is guided by the Ecology of Human Performance theory, supporting the concept that the person and context in which occupation is performed come together to give meaning and purpose to tasks (Kramer et al., 2003).

The methods used in this project included an extensive review of literature from research journals, text books, and educational web resources. The finished product resulted in a guide that is intended to be used by occupational therapists to benefit parents

and teachers in understanding the value of promoting fine and visual-motor development in the preschool age population. Above all, this guide was created for the student to achieve success in his or her occupational role as a student.

CHAPTER I

INTRODUCTION

Occupational therapists provide services that enable people to organize, manage, and perform their daily life occupations and activities (Clark et al., 2004). Leaders within the profession of occupational therapy stress the significance of placing occupation at the core of our knowledge and practice (Fisher, 1998; Wood, 1998, as cited in Humphry, 2002). Occupational therapy practitioners who work in pediatrics support a child's participation in activities of daily living, education, work, play, leisure, and social interactions (Clark et al., 2004). The profession of occupational therapy believes that a child's occupational engagement is both the process for and the outcome of development (Coster, 1998, as cited in Humphry, 2002). Occupational therapists need to further make clear their view of young children as developing occupational persons (Humphry, 2002). Occupational therapists who work in early intervention and school-based programs with children, parents, caregivers, teachers, and other disciplines are part of the team to promote the child's ability to participate in meaningful occupations.

Humphrey (2002) defined occupation as "culturally valued, coherent patterns of actions that emerge through transactions between the child and environment as activities the child either wants to do or is expected to perform", (p. 172). Performance expectations for children at the preschool level continue to increase, as curriculums become more focused on academics, early literacy, and motor skill performance. In the United States, the prevalence of fine motor difficulties in elementary age children is

estimated to be as high as 20% (Hammerschmidt & Sudsawad, 2004, as cited in Jackman & Stagnitti, 2007). Occupational therapists have been trained to assess and provide interventions to assist children experiencing fine motor difficulties affecting their occupational performance. Occupational therapy intervention has been shown to have a positive effect on children with fine motor delays (Case-Smith, 2002). A higher level of support is needed to provide children experiencing fine motor difficulties within the educational opportunities that all children deserve. Often, a lack of resources and limited knowledge in how to assist children with fine motor difficulties is evident in my own practice as a school therapist. The goal in the creation and further development of this scholarly project was to provide a resource that occupational therapists can use to inform and instruct parents, teachers, and caregivers of preschool age children about fine and visual-motor skill development. The intention was to develop a practical means of educating caregivers in the importance of facilitating these skills for the child's successful participation in fine motor skill tasks when the child begins kindergarten. The Ecological of Human Performance (EHP) theory provided the foundational framework from which this scholarly project, Promoting Fine Motor and Visual-Motor Skill Development in Preschool Age Children, is constructed. In the EHP framework, "occupations exist when the person and context factors come together to give meaning to tasks" (Kramer et al., 2003, p. 225). This framework considers the relationships between the person, the task, the context, and how the interactions among these impact performance (Kramer et al., 2003). The EHP aligns with how the child's performance with fine motor tasks is dependent on the task and the context in which he or she is to perform. Varying levels of instruction are given to children to learn these skills, which

affects performance and ultimately the child's success in school with activities involving coloring, handwriting, or cutting, as examples.

It is proposed that this scholarly project be used as a guide to assist occupational therapists with a means to disseminate information on fine and visual-motor skill development in the birth through age 5 year population to caregivers. The suggested activities included provide ways to facilitate the child's progress in this area of development. Factors influencing the application of this project are the time-constraints that occupational therapists, teachers, and parents often have to learn from each other; also, the resources needed to implement the suggested activities. The product of this scholarly project was developed with these factors in mind. Fundamental principles of development are presented, with practical suggestions given.

The terms *fine-motor skills* and *visual-motor skills* are used throughout the following chapters to indicate the child's use of his or her hands and eyes, separately or simultaneously, that affect his or her performance in occupation. The remainder of this document includes a review of current and past literature as it relates to children's development of motor skills, the occupational therapists' role in the educational setting, cultural aspects affecting children's development, and intervention approaches to address fine and visual-motor skill development. Chapter III provides a description of the process and methodology for gathering information and developing the product, *Promoting Fine Motor and Visual-Motor Skill Development in Preschool Age Children*, which is the content of Chapter IV. A summary of the purpose and use of the product is presented in Chapter V. Chapter II is a detailed analysis of the review of literature supporting the topics outlined here in Chapter I.

CHAPTER II

REVIEW OF LITERATURE

Chapter I consisted of an overview of this scholarly project. Chapter II consists of a review of relevant and applicable literature regarding the importance of promoting fine motor and visual motor skill development in children from birth through preschool age. The following review of literature identifies how valuable it is for children to acquire the foundational skills related to fine and visual motor development. Further, this review identifies what many researchers have found to be important methods to use to facilitate the development of these motor skills. Because children entering kindergarten are often referred to occupational therapy services to receive assistance for delays in fine and visual-motor skills, this scholarly project will address how occupational therapists can better educate parents and preschool teachers with ways they can promote fine and visual-motor skill development in the formative years.

Fine motor skill is the ability to control small precise movements with the fingers, wrists, and hands (Naidu, 2008). Fine motor skills are an important component of childhood development and become critical skills when a child reaches school age because fine motor ability in tasks such as cutting and writing is expected in daily school activities (Jackman & Stagnitti, 2007). Difficulty with fine motor skills can have detrimental effects on the academic, social and emotional development of a student (Beilei et al., 2002; Rosenblum et al., 2003, as cited in Jackman & Stagnitti, 2007). In the United States, the prevalence of fine motor difficulties has been estimated to be as

high as 20 percent in the primary school age children. (Hammerschmidt & Sudsawad, 2004, as cited in Jackman & Stagnitti, 2007). This is a concern given that students may spend as much as 60 percent of their school day carrying out fine motor tasks. (McHale & Cermak, 1992, as cited in Jackman & Stagnitti, 2007). Fine motor capacities greatly contribute to handwriting ability; handwriting being the primary method by which a student can display to a teacher what he or she has learned (Hammerschmidt & Susawad, 2004: Rosenblum et al., 2003, as cited in Jackman & Stagnitti, 2007). Because writing is a complex skill, a handwriting problem can result from several factors, including limited cognitive, visual-perceptual, and fine motor skills (Maeland, 1992; Tseng & Chow, 2000, as cited in Naider-Steinhart, S. & Katz-Leurer, 2007). Weil and Cunningham Amundson (1994, as cited in Daly et al., 2003) placed emphasis on visual-motor integration as an integral component in handwriting skill development, while Benbow et al (1992, as cited in Daly et al., 2003) cited visual-motor skills and fine motor coordination as foundational component skills of handwriting. Other research exploring the relationship between motor skills and academic achievement has focused on literacy. For example, Reno (1995, as cited in Rule & Stewart, 2002) found a moderate correlation between fine motor ability in young children and early literacy performance. Share, Jorm, Maclean and Matthews (1984, as cited in Rule & Stewart, 2002) found inter-digital dexterity to be a strong predictor of reading achievement. Children who have difficulty coordinating the small muscle groups in their hands have difficulty dressing, feeding themselves, and manipulating pencils, crayons, and scissors. This difficulty makes children dependent on others, opens them to ridicule from peers, and prevents them from meeting the demands of the school (Losse et al., 1991, as cited in Rule & Stewart, 2002). These children also

exhibited more behavior problems and lower achievement, with some exhibiting "intense personal feeling of failure" and a "worrying amount of dissatisfaction with those whose job it was to teach them motor skills" (Loess et al., 1991, p. 62, as cited in Rule & Stewart, 2002). The significant amount of time spent performing fine motor tasks, and the effect a difficulty in this area can have on a student, makes fine motor skills a critical component in a child's overall development (Snelling, 2003, as cited in Jackman & Stagnitti, 2007). Research has indicated that at least half of the eventual educational achievement gaps among children exist at kindergarten entry (Dreeben, 2010, p. 253).

Parents, caregivers, and teachers have an enormous responsibility to provide meaningful and purposeful opportunities in which children can develop the skills they need to be successful. Children enter the arena of 'occupation' as early as age three when preschool begins. Crepeau et al., (2003), defined occupation as "daily activities that reflect cultural values, provide structure to living, and meaning to individuals; these activities meet human needs for self-care, enjoyment, and participation in society" (p. 1031, as cited in *The Occupational Therapy Practice Framework: Domain and Process*, 2008).

With the push for academics and early literacy, school districts have begun adopting preschool curriculums to structure learning and measure children's development. For example, *The Teaching Strategies GOLD Assessment System*(Teaching Strategies, Inc., 2010) is a preschool measure used to monitor children's growth in areas such as Social-Emotional (e.g. manages feelings, interacts with peers, etc.), Physical (e.g. demonstrates balancing skills, uses writing and drawing tools, etc.), Literacy (e.g., uses emergent reading skills, writes name, etc.), Mathematics (e.g.

compares and measures, quantifies, etc.), Science (e.g., uses scientific inquiry, demonstrates knowledge of living things, etc.), and Social Studies (e.g., demonstrates knowledge about self, demonstrates simple geographic knowledge, etc.) (Teaching Strategies, Inc., 2010). This is a clear indication of an enhanced focus on achievement. This pressure for children to succeed in the academic setting intensifies as the child transitions from preschool to kindergarten and continues through the elementary school years. State standards and benchmarks for academic achievement are being implemented in the schools to meet district and state requirements. These measurements are indicators of a child's success in learning and mastery of skills. This emphasis on academic success has prompted teachers to add activities to their programs to facilitate a child's development, often without consideration to the natural sequence in which the stages of development occur. There is evidence that preschool programs designed to speed up children's academic progress, but maybe developmentally inappropriate, lead to many undesirable outcomes, including less creativity, a less positive attitude about school, and no lasting positive impact on academic performance (Meyers, 2008). If children do not meet or exceed the expectations of the curriculum, these children are often referred to special education services. In the 2004-2005 school year, more than 100,000 children with special needs transitioned out of early intervention and into preschool programs where they received special education services (Westat, 2006, as cited in Meyers, 2008). These children will transition again when they go to kindergarten. For young children in special education and their families, entering these new environments may be challenging due to the complexity of the transition process (Hanson et al., 2000; Rosenkoetter, Hains, & Fowler, 1994; Rous, Hallam, Harbin, McCormick, & Jung, 2007, as cited in Meyers,

2008). Families have to negotiate new relationships and communication between agencies providing services, different models of service delivery, and continue to advocate for their child's needs. As the child makes these transitions the nature of their occupations changes, requiring the family and child to learn new skills, habits, and roles (Meyers, 2008). Thoughtful planning, in collaboration with families, may limit stress and support a child's integration into the new school environment with success (Rice & O'Brien, 1990 as cited in Meyers, 2008). Understanding a child's natural development and aligning activities to promote these skills could help eliminate the need for many children to enter into special education services, thus avoiding the complexities described.

Occupational therapists are often the first service called upon to assist a child struggling with motor skill development that is impacting his or her participation in the classroom and interfering with his or her learning. With emphasis moving towards academic skills, even at the preschool level, fine and visual- motor skill development are not being addressed sufficiently to prepare a child with the skills he will need upon entering kindergarten. Chapter II will address this area of concern.

Chapter II Overview

The conception of this scholarly project was built on the author's desire to create a program for parents and teachers to use to promote the development of fine motor and visual-motor skills that a child needs to succeed in the educational setting. The information provided is intended to assist the student in gaining the necessary skills to advance through the curriculum successfully, without the need for additional special education services. This chapter consists of a review of literature which addresses motor

skill development and the impact delays can have on a child's academic performance. The role of occupational therapy in the educational setting, viewed from the Ecology of Human Performance Model, has been included. Further descriptions and application of the theoretical models of Cognitive Development by Jean Piaget and Psychosocial Development by Erik Erickson have also been included. Discussions on how cultural implications and socioeconomic factors affect development are presented in this chapter. Finally, intervention strategies including ergonomics, assistive technology, and collaboration with teachers and parents to embed learning opportunities in the home and school settings have been given as examples to facilitate fine and visual-motor development along with a description of the universal design for learning to meet the learning needs of all children.

Motor Skill Development

Motor skill development has been well documented in developmental literature and research. Klein (1990) indicated that children develop motor skills in a cephalocaudal, or head-to-toe direction. Control of these movements is gained in a proximal-distal direction, meaning they learn to control the joints closest to the body before being able to control the joints farthest away from the body. Stability must be achieved before mobility or controlled distal movements are possible. First movements are "whole-body" movements (Klein, 1990, p.5). Later, the child learns to disassociate, or separate the movements of one particular part of the body. In grasping, first the whole hand is used. All fingers do the same thing at the same time. Gradually, children learn to move the thumb separately and in opposition to the fingers and to use fingers separately for the refined demands of precise grasping (Klein, 1990).

The development of hand skills is critical to the child's ability to play and explore, to perform daily living skills, and to function in life. Basic grasp and release patterns quickly mature into efficient manipulative skills in the first years of life. The sequence of hand skill development is driven by neurologic maturation and is influenced by the environment and the child's experience (Henderson & Pehosky, 1995). Grasp and hold patterns, which are first associated with proprioceptive-tactile input, become grasp with manipulate patterns guided by tactile, proprioceptive, and visual input (Bushnell, 1985; McCall, 1974, as cited in Henderson & Pehoski, 1995). By the end of the first year, infants initiate purposeful movements to experience space, to manipulate the environment, and to communicate with others (Bruner, 1970; Gilfolye, Grady, & Moore, 1990; McGraw, 1943, as cited in Henderson & Pehosky, 1995). The one year old child begins to handle and manipulate objects according to their functional purpose. Hand movement becomes an important way for the child to experience the environment and relates highly to functional abilities in all areas. During the second year and years following, hand skills become highly associated with cognitive skills and the purposeful intentions of the child. While the hands continue to adapt to the sensory qualities of the objects held, movements are directed by the child's purposeful exploration and manipulation of the environment. (Henderson & Pehoski, 1995).

Stages of Development

Children go through various stages when they are learning to play and interact with their environment. One of the earliest stages is the sensory explorative stage (Klein, 1990). In this stage, children learn how to move their body parts, to isolate reach and grasp and to coordinate those skills with vision. Mouthing, reaching, grasping, dropping,

shaking, banging, and throwing dominate this (Klein, 1990). Gradually, interest turns to learning how things work. Cause-effect toys are the most interesting at this transitional stage of development. Children at this stage develop specific pushing, pulling, poking, turning, and rolling skills (Klein, 1990). Children then enter the constructive stage of play (Klein, 1990). This stage is comprised of filling, building, stacking and putting together (Klein, 1990). Instead of seeing objects as a whole, children begin to notice and interact with the parts. They begin to understand shapes, sizes, and concepts that show relationships of parts (Klein, 1990). Coordinating the eyes with the movements of the hand is essential for a child to later learn the skills of coloring, drawing, cutting, reading, and writing. Ocular motor skills consist of control and coordination of eye movements (Lane, 2005). These movements are important for success in reading and school performance. Deficits can severely impair a child's ability to effectively scan his environment, and in turn, devastate him or her functionally (Wolff, 1973, as cited in Lane, 2005).

Motor learning conceptualizes that the behavior of a system at any one point results from "a confluence of all the functionally related components" (Kamm, Thelen, & Jensen, 1990, p.763, as cited in Asher, 2006). Ayres (1979) described the first seven years of life being the years of sensory-motor development. These years lay "the groundwork for the more complex sensory integration that is necessary for reading, writing, and good behavior" (Ayres, 1979, p.7). Developmental components that contribute to a child's ability to participate in his occupation as a student in the formative years of preschool and into the elementary years involve many skills, including the following: proprioceptive/kinesthetic (perception of hand/body movement and position of

the hand); bilateral integration (use of two body sides together in a coordinated manner); posture/balance (secure, upright position for coordination of the arm, hand, and eyes); tactile (touch and sensation of objects); and motor planning (sequencing motor actions) (Benbow, 1995, as cited in Asher, 2006). Additionally, refinement of fine motor components that involve thumb development, hand arches (shapes the hand and allows for skilled movement of the fingers), in-hand manipulation (refinement of grasp by shifting and rotating objects), motoric separation of the hand (index finger, middle finger, and thumb manipulate; ring and little fingers stabilize), eye-hand coordination (eye movements guide action of the hand), and laterality (superiority of skill and function of one hand over the other on either side of midline) (Benbow, 1995, as cited in Asher, 2006). All students, especially the great variety of children who are minimally delayed, can be helped by developmentally sequenced physical, visual, kinesthetic, and fine motor learning (Henderson & Pehoski, 1995). Parents and teachers need to be more aware of providing opportunities for children to acquire these skills. This scholarly project will educate caregivers in ways in which they can facilitate children's fine and visual-motor skill development. This will allow the children to be better prepared to participate and be successful in their occupation as a student.

Home and School Environments

Opportunities for skill development and learning can be created within everyday life by structuring the environment or using unexpected events (Bruder & Dunst, 1999; Bruder & Dunst, 2000; Dunst, Trivette, Humphries, Raab, & Roper, 2001, as cited in Pierce et al., 2008). Over the past decade, the policy of natural environments has shaped early intervention services in individual states and with occupational therapy (Hanft &

Anzalone, 2001, as cited in Pierce et al., 2008). To offer family-centered interventions in natural environments, such as the home, daycare, or school-settings, therapists must look beyond familiar preplanned activities to integrate intervention into natural learning opportunities offered by everyday contexts. The typical unfolding of infant-toddler interaction with the objects and spaces of the home, helps his or her in identifying, using, and demonstrating to family members the wealth of developmental challenges readily available in the home. Research on the development of particular skills important in development has generally been accomplished and presented separately from the context in which it occurs (Pierce, Munier, & Teeters-Myers, 2008). Educating parents, caregivers, and teachers on how children develop and using resources available in the child's natural setting can have a positive impact on learning and acquisition of skills. What parents do to support and encourage child learning as part of the children's participation in everyday activities is important for number of reasons. Researchers (Kassow & Dunst, 2004; Kassow & Dunst, 2005; Shonkoff & Phillips, 2000, as cited in Dunst, 2006) have indicated that parent responsiveness to and support of child behavior in the context of everyday activity settings is a potent strategy for supporting and strengthening child competence, expression, and for promoting child acquisition of new abilities.

Occupational therapists working with the preschool age population need to consider all the facets of a child's development and educate parents, caregivers, and teachers about developmental and motor skill milestones. Considerations for instruction should also be given for health promotion, illness prevention, and safety for the child. Occupational therapists can teach caregivers how to use the home environment, toys, and

everyday activities to facilitate the child's developmental goals. For example, the infants' toys can be place just out of reach to encourage reaching, rolling, and visually attending to the object. For a toddler, toys can be placed out of reach on a table or sofa to encourage pulling to stand, cruising, or climbing. As the child moves into the preschool age and begins interacting with peers and a new environment, teachers can be instructed to incorporate fine motor activities (lacing cards, bead stringing, block stacking, scooping and pouring activities, etc.) to promote hand skill and visual-motor development. These skills are necessary for the child when he begins purposeful coloring, cutting, and handwriting tasks.

In order to contribute to better health outcomes and reduce health inequalities for individuals, communities, and populations, occupational therapy practice must be consistent with key principles of primary health-care and health promotion. Activity must occur on a range of levels in order to achieve health outcomes (World Health Organization (WHO), 1986; WHO, 1997, as cited in Priest, 2005). Occupational therapy practice needs to ensure it is relevant to the needs of young children, especially those at risk. As well as seeking to build individual skills of children, best practice early childhood occupational therapy must build the capacity of parents and teachers of the early childhood population (Priest & Waters, 2007).

Identifying Delays

Children's ability to move efficiently in their environment and manipulate materials through play provides them with opportunities to learn. It is important to provide opportunities for children with motor impairments with play skills they can do successfully (Morrison & Metzger, 2001, as cited in Willard & Spackman's Occupational

Therapy, 2003). When development is delayed, families and teachers alike have many questions regarding what expectations are reasonable for the development of the affected children. Caregivers want to know how their child is performing relative to the expectations for children of the same age and disability, and want information that can help them set realistic goals for their child. Many of their questions relate to everyday functional performance, occupations, and participation (Dolva et al., 2004). Having a working knowledge of the developmental sequence of skill attainment is important. Allowances for developmental delays and challenges that atypically developing children exhibit should be made. When a child's participation in a functional or academic activity is compared to that of a typically developing child, gaps in performance can be identified and interventions to target those skill delays can be addressed (Buxton, 2009). These interventions can become part of the home or school routine of the child, enhancing performance, independence, and building the child's self-esteem. School readiness, in the broadest sense, involves children, families, early environments, and communities (National Association of State Boards of Education, 1991, as cited from Maxwell & Clifford, 2004). Children's skills and development are strongly influenced by their families and through their interactions with other people and environments before coming to school. Child care centers and family child care homes are important early environments that affect children's development and learning (Maxwell & Clifford, 2004). In 1997, The National Education Goals Panel (NEGP, 1997, as cited in Maxwell & Clifford, 2004) identified five domains of children's development and learning that are important to school success: physical well-being and motor development, social and emotional development, approaches toward learning, language development, and

cognition and general knowledge (Kagan, Moore, & Bredekamp, 1995, as cited in Maxwell & Clifford, 2004). Despite the presence of the factors identified by NEGP, most states in the U.S. use age, not skill level, as the criterion for determining when a child is eligible—and legally entitled—to attend public school (Saluja, Scott-Little, & Clifford, 2000, as cited in Maxwell & Clifford, 2004). It is vitally important that children are allowed as many learning opportunities prior to their transition to school so that learning can continue and they can be productive and successful as they progress through each grade level. Learning opportunities, however, may be limited in the presence of development delay. One method used to identify delays is early intervention assessments.

Early intervention assessments can be done in the home, clinic, or at a child screening clinics often held in the community. Results of these screenings can help identify areas the child may be delayed. Examples of assessment tools used in early intervention to identify children's developmental needs (including fine and visual-motor skills) are the Early Learning Accomplishment Profile (ELAP), the Hawaii Early Learning Profile (HELP), and the Assessment, Evaluation, and Programming System for Infants & Children (AEPS).

The Early Learning Accomplishment Profile is a criterion- referenced assessment that examines gross motor, fine motor, cognitive, language, self-help and social/emotional abilities of children functioning in the birth to 36 month age range (Glover et al., 1988).

The Hawaii Early Learning Profile is a curriculum-based assessment that examines cognitive, language, gross motor, fine motor, social, and self-help skills from birth to 36 months (Vort Corporation, 2011). The Assessment, Evaluation, and Program System for

Infants & Children is a curriculum-based, criterion-referenced test of fine motor, gross motor, cognitive adaptive, social-communication, and social development for children birth to 6 years (Paul H. Brooks Publishing Company, Inc., 2011). Identified delays may require the intervention strategies of an occupational therapist who would work with the child, his or her family and his or her teacher to address occupational dysfunction and remediate motor development. In schools, services for students with disabilities are integrated into an educational setting with therapy goals that need to be educationally necessary and relevant to the curriculum (Clark, 2005: Polichino, 2001; Swinth & Handley-More, 2003; Swinth et al., 2002, as cited in Bose & Hinojosa, 2008). A widely used curriculum for preschools is The Creative Curriculum for Preschool (Teaching Strategies, Inc., 2010). This curriculum is geared for children between the ages of three and five years. Development is assessed in the categories of social/emotional, physical, cognitive, and language skills (What Works Clearinghouse, 2009). Following the assessment, resources are provided to the parents to guide their determination of which services would best meet the child's needs. As evidenced by the research, motor skill deficits can significantly impact a child's learning and performance in the necessary tasks of self-help, coloring, cutting, drawing, and writing. By equipping parents and early child educators with resources and strategies to facilitate fine and visual motor skill development, children can advance to the next level of learning and participate with their peers without significant discrepancies in their performance. One important contributing member of the child's and family's educational team is the occupational therapist; a professional who is readily prepared to assist in providing education and resources to the child, child's family, and child's teacher.

Occupational Therapy in the Educational Setting

Occupational Therapy Practice Framework: Domain and Process-2

The profession of occupational therapy uses the term *occupation* to capture the breadth and meaning of "everyday activity" (American Occupational Therapy Association [AOTA], 2008, p. 628). Occupational therapy is founded on an understanding that engaging in occupation structures everyday life and contributes to health and well-being. The Occupational Therapy Practice Framework: Domain and Process. 2nd Edition (Framework-II) (OTPF-2) is an official document of the American Occupational Therapy Association (AOTA). The Framework was developed to articulate occupational therapy's contribution to promoting health and participation of people, organizations, and populations through engagement in occupation (American Occupational Therapy Association [AOTA], 2008, p. 626). Occupations are "activities... of everyday life, named, organized and given value and meaning by individuals and a culture" (Law, Polatajiko, Baptiste, & Townsend, 1977, p. 34, as cited in Clark et al., 2004). Occupational therapists focus on the following occupations: activities of daily living, education, leisure, play, social participation, and work. Occupational therapists work in early intervention and school-based programs with children, parents, caregivers, educators and other team members to facilitate the child's ability to engage in meaningful occupations. These occupations are tasks that are meaningful for the child and may be based on social or cultural expectations or what peers are performing (Clark et al., 2004). For example, a preschool child may have difficulty sustaining his grip on crayons or using scissors due to weakness and low muscle tone. The occupational therapist collaborates with the teacher, assesses the environment and the demands of the task, and

addresses appropriate solutions to allow the child to participate using adaptations.

Another example is instructing parents in positioning techniques for a child with physical impairments.

The occupational therapy service delivery process includes evaluation, intervention, and outcomes (American Occupational Therapy Association [AOTA], 2008). During the evaluation, the occupational therapist must gain an understanding of the child's priorities and problems he has engaging in occupations and activities.

Intervention includes specific strategies used to assist a child in acquiring a new skill, or being more efficient in his or her performance. Evaluation and intervention address factors that influence occupational performance. These factors include: performance skills (e.g. motor, process, and communication/interaction skills), performance patterns (e.g. habits, routines, and roles), context (e.g. physical and social environments), activity demands (e.g. required actions and body functions), and client factors (e.g. mental, neuromuscular, sensory, visual, perceptual, digestive, cardiovascular, and integumentary systems) (Clark et al., 2004).

Outcomes relate to the child's ability to complete occupations which are vital to his or her success. Occupational therapy focuses this process toward the goal of supporting the child's participation through engagement in occupation (American Occupational Therapy Association [AOTA], 2008). Outcomes in the context of the school setting often address the child's academic success as the child demonstrates successful completion of his or her work independently.

Early Intervention and Preschool Contexts

The Individuals With Disabilities Education Act (IDEA) is the key federal law supporting occupational therapy services in early intervention and school-based settings. IDEA (Part B) mandates occupational therapy as a service for those children with disabilities, 3-21 years old (Jackson, 2007). IDEA (Part C) allows for occupational therapy as a primary early intervention service for children up to 3 years of age who are experiencing developmental delays or who are at risk of having a delay (Jackson, 2007).

When evaluating infants or toddlers, the occupational therapist considers their strengths and needs with respect to five areas of development: physical cognitive, communication, social-emotional, and adaptive. The occupational therapist considers the child's strengths and needs with respect to these areas and their ability to participate in the environment at home, school, day care, and community. IDEA requires that services be developed in collaboration with the child's caregivers, educators, and community agencies. These services become part of the individualized family service plan (IFSP). Under Part B of IDEA, the local school district is responsible for qualifying whether a student needs special education and related services. Occupational therapy is one of the related services that may be provided to an IDEA-eligible student. The student is served on an Individual Education Plan (IEP). According to Nolet and McLaughlin (2000, as cited in Clark et al., 2004), the IEP indicates needed accommodations, modifications, and instructional strategies to access the general education curriculum and other educational supports for behavior skills, social skills, or skills needed for activities of daily living.

Presently, there is an absence of congruence between the needs of children with fine and visual-motor deficits and the contexts in which they engage in education in early

intervention and preschool. The intention of this scholarly project is to provide a resource that contains information that preschool teachers and parents of young children find valuable in assisting the development of fine and visual-motor skills in preschool age children. By educating teachers in techniques to use in the classroom, it is anticipated that opportunities will be provided for all children in the classroom, not just the child with an IEP. In this way, this project will promote the practice of universal design, where all children can have access to skill building activities, thus the benefits can be reaching multiple children. By including the Early Access (birth to age 3) population, this resource can prove valuable in providing interventions that parents can be engaging their child in at home. The materials will be helpful in informing parents with how they can be assisting their child to gain skills that will enhance their successful participation in the classroom environment. Children who have a positive school experience tend to engage more, learn more, and develop independent performance in occupation than those who cannot successfully meet the challenges of the classroom. In addition, the need for special education services can be minimized or eliminated by providing valuable learning experiences for the child. One theoretical model that may be used as a foundation for addressing the incompatibility context and the individual's ability is the Ecology of Human Performance.

Ecology of Human Performance

The Ecology of Human Performance (EHP) is a framework based on the relationships among persons, task, and context and the impact that these variables have on performance (Kramer et al., 2003). The four constructs (person, task, context, and

performance) are equally important within the EHP framework, however, the essential role context plays in task performance is emphasized.

Person refers to an individual with unique abilities and skills based on experiences, interests, and values (Kramer et al., 2003). Sensorimotor, cognitive, and psychosocial skills are also variables that influence and create complex, distinct persons (Kramer et al., 2003).

Task is defined as an objective set of behaviors that are performed to accomplish a goal (Kramer et al., 2003). Individuals engage in a variety of tasks, which can be organized and defined differently by different people. For example, the task of a child cutting could be categorized to include all the steps necessary to gather the materials needed, grasp, hold, and position the scissors for cutting, use the alternate hand to secure the paper, visually attend, and coordinate his hands and eyes together to accomplish the task. These tasks that individuals participate in can form a person's role, or occupation. The set of interrelated conditions that surround a person is referred to as *context*.

Temporal contexts include chronological age, developmental stage (phase of maturation), life cycle (place in important life phases), and health status (Kramer et al., 2003). Temporal contexts occur within the person, however, are deemed contextual due to the social and cultural meanings attached to the contexts (Kramer et al., 2003). Environmental contexts include physical, social, and cultural dimensions (Kramer et al., 2003). Context variables, which are aspects that support or inhibit performance, are also considered within the EHP frame of reference (Kramer et al., 2003).

The EHP focuses on context and how various factors in the environment can impact performance (Kramer et al., 2003). Tasks and activities that are meaningful to the

client are identified using a client-centered approach. Under this framework, the therapist defines strategies "to overcome barriers that would limit the client's performance" (Law et al., 2005, p.13). When evaluating occupational performance, therapists attempt to understand "how the dynamic relationship between person, environment, and occupation, as well as a person's developmental stage, culture, and societal roles impact his ability to perform the tasks and activities that are important to the person" (Law et al., 2005, p. 108). The EHP framework examines the relationship between the person and the environment, and includes the physical, temporal, social, and cultural elements that impact a person's performance (Kramer et al., 2003). These context variables "must be considered when understanding performance because they may facilitate or hinder performance" (Kramer et al., 2003, p. 227). This framework includes "a person's experiences and sensorimotor, cognitive, and psychosocial skills and abilities" (Dunn et al., 1994, p. 598). The person is then able to derive meaning from the task. Persons with limited abilities or impairments in functioning derive less meaning from their performance of tasks when the context does not support their performance.

Intervention strategies within the EHP framework are intended "to support the performance need of the individual" (Kramer et al., 2003, p. 231). Intervention may focus on the task, the context, the person, or a combination of these. Five intervention strategies used in the EHP are as follows: 1) Establish/restore attempts "....to establish a skill or ability that has not yet developed or to restore a skill or ability that has been impaired" (*American Occupational Therapy Association [AOTA]*, p. 657). 2) Alter, defined as "altering the actual context in which tasks occur" (Kramer et al., 2003, p. 232). 3) Adapt/modify is directed at "finding ways to revise the current context or activity

demands to support performance in the natural setting..." (American Occupational Therapy Association [AOTA], 2008, p. 658). 4) Prevent, as "to prevent the occurrence or evolution of barriers to performance in context" (American Occupational Therapy Association [AOTA], p. 659), and 5) Create, which is "to provide enriched contextual experience that will enhance performance for all person's in the natural contexts of life." (American Occupational Therapy Association [AOTA], 2008, p. 657).

The Ecological Model of Occupation addresses the goals of this scholarly project, with the framework of this model, The Ecology of Human Performance (EHP) emphasizing that "performance cannot be understood outside of context" (Kramer et al., 2003, p. 227). This framework allows for greater variations in intervention strategies, giving more flexibility to meet the changing needs of the client. Considering this scholarly project will be addressing the on-going development of children from birth through age five, the EHP framework provides a valuable practice model for the occupational therapist to work within. An example of application of this framework would be to go into the child's home environment (context) where the skill is expected to be performed allows the therapist to establish goals that are relevant to the situation. This same concept applies to the preschool setting where the child is participating in purposeful and meaningful occupations. The therapist can alter the context, adapt/modify the task itself, or create situations to maximize performance.

Providing resources to inform parents and teachers of preschoolers the importance of fine and visual motor development and strategies to facilitate the development of these skills is the purpose of this scholarly project. All too often, children's fine motor development is overlooked, as academic progress becomes more a focus of children's

development. Using the EHP frame of reference as a theoretical guide in the development of the resources will enhance the therapists' assessment of the contexts where the performance will occur, taking into consideration the temporal, physical, and cultural environments of the child. Intervention strategies within this framework (establish/restore, alter, adapt/modify, prevent, and create) address the goals of this project by establishing new skills for the child to prevent performance problems later on. The EHP will serve as a guide in addressing the areas of concern that the project goal will attempt to remedy. By creating a resource tool that will "employ principles of universal design" (Kramer et al., 2003, p. 232) many children will benefit from the teacher using this resource in the classroom since the curriculums do not fully address this area of development. In early intervention with the children from birth to age three, this resource will create opportunities to facilitate fine and visual motor skill development that caregivers may not be aware of and can be intentional in providing for their child.

The EHP framework allows the therapist to consider the context variables that are supporting or hindering the child's engagement and performance of fine and visual-motor tasks. The resources made available to teachers and parents from this project will consider context variables in the home and school environments. Lastly, the EHP framework provides a multidisciplinary approach to addressing student needs. This allows for collaboration among the many disciplines that are often involved in meeting the needs of the student. By having all the disciplines work with the child in the same context, outcomes for the child can be enhanced as goals are intertwined and written in collaboration with other disciplines. Improving outcomes and performance skills in the child is the goal of parents, teachers, and support services working with the child.

Theoretical Models of Development

Two developmental theories, Jean Piaget's Stages of Cognitive Development and Erik Erickson's Stages of Psychosocial Development, are also valuable tools for addressing the motor skill needs of the preschool population. Cognitive Development Theory was promoted by Jean Piaget (Dreeben, 2010). Piaget developed a four-stage model of how the mind processes new information. The first two stages of learning, the *sensorimotor stage* (birth to 2 years old) and the *preoperational stage* (2 to 4 years old), help define the product that will be used for the education of the targeted population. In the sensorimotor stage, "the infant builds an understanding of him or herself and reality by interacting with the environment" (Dreeben, 2010, p. 184). The child recognizes that his or her actions often result in a response so he or she begins "to act intentionally, such as shaking a rattle to make noise" (Dreeben, 2010, p. 185). In Piaget's preoperational stage, "the child is not able to conceptualize abstract ideas, instead requiring concrete physical situations" (Dreeben, 2010, p. 185). The child's active role in learning can be emphasized using toys for playing or increasing motor skills.

Similar to Piaget, Erikson's Psychosocial Theory of Development considers the impact of external factors, parents, and society on personality development from childhood to adulthood (Dreeben, 2010). Erikson's theory outlines eight stages of development; the first three addressed by this project in Chapter IV. The first stage is the period from birth through 18 months of age, called basic trust vs. mistrust (Dreeben, 2010). At this stage the child needs "to be nurtured and loved to develop trust, security and optimism" (Dreeben, 2010, p. 244). When the child is handled improperly, she or he will become insecure and mistrustful. The second stage begins at 18 months and ends

when the child turns 3 years of age, called autonomy vs. shame (Dreeben, 2010). Within this stage, the child "wants autonomy to form his or her own identity" (Dreeben, 2010, p. 245). When handled properly, given reasonable choices and appropriate guidance, the child emerges from this stage confident and proud. Erikson's third stage is the period of development from age 3 years to age 6 years (Dreeben, 2010). Erikson called this stage initiative vs. guilt (Dreeben, 2010). The child is initiating tasks, planning, and learning to master his environment (Dreeben, 2010). The child needs to experience some guilt for his actions to keep a healthy balance between self-control and independence (Dreeben, 2010). In these early childhood stages of infancy, toddler, and preschool growth and development are guided or misguided by the adults who care for the child. As described by Piaget, the primary modes of learning for the infant and toddler are sensorimotor (Dreeben, 2010). Because of the infant's dependence on his caregivers, the instruction of sensory and motor skill development should be directed at his parents. The infant is learning through sensation and movement, therefore teaching should be geared toward integration of sensory stimulation activities with motor development (Dreeben, 2010). Erickson feels that in infancy, the child must be able to trust his caregivers to gain confidence. The emphasis then becomes on the parents' ability to nurture, care, guide, and protect them (Dreeben, 2010). Providing education and instruction to parents and teachers of a disabled child is can be more challenging. The developmental theories of Piaget and Erikson seem to assume the child is healthy and free from impairments that could hinder his or her development. However, occupational therapists need to have knowledge of child development to be able to set goals and provide realistic and attainable outcomes for the child. The occupational therapist can help decrease parental

anxiety, teacher expectations, and assist the educational team in providing accommodations the child may need to participate in school. An example of this would be a child with cerebral palsy transitioning from early intervention services in the home to the preschool setting. The occupational therapist would evaluate and determine the child's level of development, then provide accommodations for the child to still be able to participate in the routines and activities at the preschool. In the case of fine motor and coordination delays, the therapist can suggest adapted coloring devices, an incline writing surface, or positioning strategies to increase efficiency of movement.

The early years and appropriate services to support children and families are currently the focus of much attention throughout the world. Recent advances in brain development research and increased understanding of the impact of early year's experiences on later health, behavioral and social outcomes have put children and families on the agenda of governments, service providers and researchers (Belli et al., 2005; Hertzman, 2000: McCain & Mustard, 1999, 2002; Stanley et al., 2005, as cited in Priest & Waters, 2007). Increased interest is focused on finding the best way of supporting early childhood development in order to maximize later benefits. Results for children from projects such as the High Scope/Perry Preschool study (Schweinhart, 2005, as cited in Priest & Waters, 2007) and Early Head Start (Love et al., 2002, as cited in Priest & Waters, 2007) have meant that universal preschool programs are frequently advocated as "evidenced-based effective strategies for improving population health both in childhood and in adulthood, especially for children at risk of developmental or health difficulties" (Glass, 1999; Love et al., 2002, as cited in Priest & Waters, 2007).

Collaboration

Understanding these theories of development gives the therapist a working knowledge in which to educate parents and teachers. This collaboration, with the best interest of the child in mind, promotes a positive environment for the child to develop and learn necessary skills. Friend and Cook (2000, as cited in Bose & Hinojosa, 2008) developed a theoretical framework in which they outline collaboration. According to their model, those involved in a collaborative effort have equal status and are working toward a common goal. Those who are involved in the collaboration process often share decision making, resources, and accountability for outcomes. According to Friend and Cook, characteristics of collaboration include a mutual trust that develops between those who collaborate. Other benefits of collaboration include increased opportunities for professionals to develop new skills and share ideas and strategies and improved cohesiveness in services for students with disabilities (Coben, Thomas, Sattler, & Morsink, 1997, as cited in Bose & Hinojosa, 2008). Collaboration creates opportunity for more effective communication between team members working to enhance the child's skills for improved academic outcomes and overcome barriers inherent in the child or because of the environment in which he lives. These barriers could be related to the child's cultural environment or socioeconomic status in which the child lives.

Cultural Implications of Development

Ethnicity

Cultural diversity is increasing rapidly in schools and classrooms. "By (the year) 2020, almost half of the U.S. population will consist of member of non-Caucasian cultural groups" (Kauchak, & Eggen, 2005, p. 85, as cited in Merlino, 2002). The United

States is a model of multiculturalism. People of many ethnic cultures blend into one society yet at the same time maintain their original culture. This blending creates unique opportunities for occupational therapists to work with people from many different cultures (Dreeben, 2010). With this opportunity also arises the obligation to learn about the cultural values of different ethnic groups, being able to adapt and accommodate for the differences in health principles and values. The effectiveness of client education is enhanced when the therapist includes the client's cultural perspectives. A therapists' cultural awareness and sensitivity can influence a client's ability to receive and apply the information provided. In most cases, the family and community levels have the greatest and most direct influences (Dreeben, 2010). It is within families that one learns how to be in the world—how to understand and interact with the world and the people around us. Families provide the context for learning the beliefs, values, attitudes, and customs that guide one's life. "Familial interactions and the roles played by family members are influenced by many factors influenced by culture, including perceptions of health, illness, disability, normality, expectations about the role, and the rights and responsibilities of all the people involved" (Fitzgerald, 2004, p. 495). In addressing the developmental needs of children from diverse ethnic groups, occupational therapists need to be culturally aware and sensitive to the values that are different from their own and the implications that these differences may have on therapy outcomes. For example, Asian cultures typically value family or group needs over individual ones (Merlino, 2002). This system of values may impact whether the child receives consistent intervention, if the family as a whole has greater needs (Merlino, 2002). Yet another aspect when addressing children's development and therapeutic outcomes is a clients' socioeconomic status.

Socioeconomics

Socioeconomic status is considered by some researchers to strongly influence normal development. Differences in children's abilities in intelligence, cognitive skills, and motor behaviors have been attributed to socioeconomic status (Bowman & Wallace, 1990). Children from upper-or middle-class backgrounds typically perform at a higher developmental level than children from disadvantaged backgrounds (Bowman & Wallace, 1990). Many researchers have used Piagetian tasks to examine differences in cognitive function, usually finding differences between social classes. Figurelli and Keller (1972, as cited in Bowman & Wallace, 1990) found that after equal training opportunities, children in middle socioeconomic levels scored significantly higher and required less repetition to learn a task than children of lower socioeconomic status. Gaudia (1972, as cited in Bowman & Wallace, 1990) studied African American, Caucasian, and Native American children, and found that a child's socioeconomic status is a better predictor of abilities when compared with the child's race. In contrast to these findings, Martin, Sewell, and Manni (1977) studied race and social class effects on visuomotor integration. They found that children in middle to high and middle socioeconomic status scored much higher than the lower socioeconomic group but race was found as a strong predictor of performance. Researchers have consistently concluded that differences in skills and abilities exist among children from varying socioeconomic backgrounds. For example, in comparing hand strength in higher and lower socioeconomic levels of children, right hand strength of the child from a higher socioeconomic status was greater than that of the child from lower socioeconomic status (Bowman, 1985). One explanation for this is that the children from the higher

socioeconomic group have more opportunities to use crayon, pencils, and scissors, which increases the development of the right hand strength (Bowman & Wallace, 1990). The differences found between the two groups agrees with the findings of Judd et al., (1986), who reported social class differences in writing tasks of first graders, with the subjects from the higher socioeconomic status group writing faster and more accurately. These findings also agree with those of Wallace and Martin (1970, as cited in Bowman & Wallace, 1990), who found significant differences in the drawing tendencies of children from varying social classes. The higher socioeconomic status group drew less expansively than the lower socioeconomic group tested. Using The Developmental Test of Visual-Motor Integration (VMI), Martin et al., (1977) studied whether race and socioeconomic status affected performance of these skills. They found differences favoring the high socioeconomic status group and white children, attributing these differences to a greater incidence of prenatal or postnatal damage in the lower social classes, difference in intelligence, and differences in experiences with writing tools.

Researchers have also suggested that children from different socioeconomic statuses show differences in play behavior. Play provides a child with skills and knowledge necessary for the development of intellectual, emotional, social, and physical abilities (Jamelson & Kidd, 1974: Munoz, 1986; Winnicott, 1971, as cited in von Zuben et al., 1991). Poverty is thought to hamper a child's ability to participate in normal play activities. These play deficits may impede adaptation to new and more complex situations (von Zuben et al., 1991). Because poverty may lead to play deficits in children, the effect of socioeconomic status on children's play is an important consideration of this project. For instance, children in this situation may not have

available toys or materials with which to practice visual-motor coordination activities such as stringing beads or coloring. Although low socioeconomic status may adversely affect a child's development, other factors, such as positive experiences outside of the home, may help counterbalance these effects. Two of the positive factors identified in the literature are quality educational settings and peer interaction. (von Zuben et al., 1991). This project will support and enhance the early access and preschool programming by educating teachers and parents in ways to facilitate fine and visual-motor development. Educating teachers and parents on ways to embed fine and visual motor activities into a child's daily experiences will be applied within the scholarly project.

Social justice has been defined as "ethical distribution and sharing of resources, rights, and responsibilities between people, recognizing their equal worth as citizens. [It recognizes] 'their equal right to be able to met basic needs, the need to spread opportunities and life chances as widely as possible, and finally the requirement that we reduce and where possible eliminate unjustified inequalities'" (Commission on Social Justice, 1994, p. 1, as cited in (American Occupational Therapy Association [AOTA], 2008). Wilcock defined social justice as "the promotion of social and economic change to increase individual, community, and political awareness, resources, and opportunity for health and well-being" (Wilcock, 2006, p. 344, as cited in (American Occupational Therapy Association [AOTA], 2008). Intervention at a community level should take place as early in the lives of children as possible. This intervention should be based off the principle of developmentally sequential activities that are interesting to the child.

programs that can be implemented by parents or preschool teachers may improve fine motor skills needed for continued learning and success in school (Verdonck & Henneberg, 1997). This scholarly project will provide parents and teachers from all cultures and socioeconomic statuses with information on the natural development of children's motor skills. Opportunities will be opened for children from all backgrounds to benefit as their caregivers provide ways in which they can develop fine and visual-motor skills, appropriate to the child's age. These skills will be beneficial for the child's successful participation in school, possibly eliminating the need for special education services in this area of performance.

Intervention Approaches

Ergonomics

The Education for All Handicapped Children Act of 1975 (Public Law 94-142), promoted reflection and review of educational services bringing about important shifts in the delivery of special education and related services (Argabrite Grove, 2002, as cited in Bazyk et al., 2009). The 1997 reauthorization of the Individuals With Disabilities Act (IDEA: Public Law. 105-17) placed greater emphasis on delivering related services to children with disabilities within the context of the student's curriculum and general education environment (Muhlenhaupt, Miller, Sanders, & Swinth, 1998, Nolan, Mannato, & Wilding, 2004, as cited in Bazyk et al., 2009). Occupational therapists have had to become knowledgeable about the curriculum so they can be specific on how a student's disability affects functioning within the classroom and develop relevant intervention strategies. Also, understanding the teacher's focus and her educational philosophy is also important for effectively suggesting intervention strategies (Bazyk et al., 2009).

During the preschool years, children acquire important hand skills that lay the foundation for success in many areas of school function, such handwriting, cutting, manipulating small objects, and self-care tasks, e.g. clothing fasteners, using a spoon, etc. (Case-Smith et al., 1998; Meyers, 2006, as cited in Bazyk et al., 2009). Developmental delays in preschool age children often manifest themselves as incomplete mastery of the fine motor skills needed to begin handwriting. Handwriting being one of the most frequent reasons for a referral for occupational therapy services (Case-Smith, 1995; Oliver, 1998; Reisman, 1991; Wehrmann, Chiu, Reid, & Sinclair, 2006, as cited in Bazyk et al., 2009). Typically developing children from low socioeconomic status in urban communities may also have delays in fine motor skills and handwriting development because of limited access to crayons, pencils, markers, etc. (Peterson & Nelson, 2003; Purcell-Gates, L'Allier, & Smith, 1995, as cited in Bazyk et al., 2009). Biomechanical, sensorimotor, or teaching-learning approaches may be applied during occupation-based activities to improve specific component function and to help the child generalize the skills needed to function in school (Case-Smith, 1996; Cornhill & Case-Smith, 1996; Tseng & Murray, 1994; Weil & Amundson, 1994, as cited in Bazyk et al., 2009). Cornhill and Case-Smith (1996, as cited in Bazyk et al., 2009) reported a significant correlation between in-hand manipulation and handwriting skill. Visual-motor integration has also been noted as a strong predictor handwriting skill (Tseng & Murray, 1994, as cited in Bazyk et al., 2009). In a study of the relationship between components and function, Case-Smith (2000) concluded that "the relationships expressed validate the performance components—skills—functional performance model used to evaluate the

children and support the hierarchy of performance that links components to skills to function and roles" (p. 378, as cited in Bazyk et al., 2009).

Work is a term that refers to activities that involve purpose and effort (Pheasant, 1991, as cited in Rosenblum et al., 2006) and are related to various roles that person undertake during different stages of their life (Jacobs & Bettencourt, 1995, as cited in Rosenblum et al., 2006). Functionally effective work performance is that which produces a quality product through an efficient process (Eklund, 1997, as cited in Rosenblum et al., 2006). With respect to children, academic school activities can be considered as a major domain of their occupational work performance (Parush, Levanon-Erez, & Weintraub, 1998, as cited in Rosenblum et al., 2006). Since 30% to 60% of children's school day is spent in the performance of fine motor tasks, primarily handwriting, it is necessary to consider performance of handwriting in terms of its quality and efficiency (Rosenblum et al., 2006). Because handwriting is an important component of the child's "work" at school, consideration of ergonomic factors that contribute to handwriting efficiency and productivity are needed (Parush et al., 1998, as cited in Rosenblum et al., 2006).

Ergonomics is a body of knowledge that focuses on the study of work performance with an emphasis on human safety and productivity (Jacobs & Bettencourt, 1995, as cited in Rosenblum et al., 2006). Ergonomic factors could add important information about the child and his or her relationship with handwriting tasks, tools, and with the environment. (Rosenblum et al., 2006). Body posture is generally considered to have an important influence on the efficiency of the writing process and product (Yeats, 1997). Clinicians have observed that trunk instability due to low muscle tone among children prevents them from making necessary postural adjustment while focusing on

activities that require fine motor skills such as handwriting (Amundson, 1992).

Positioning may refer to either the physical positioning of children with adaptive equipment or providing tables and chairs of the correct height and fit to allow for optimal seating (Sents & Marks, 1989). The use of adaptive seating devices has been shown to have a significant positive effect on the development of feeding skills in children with multiple disabilities (Hulme, Shaver, Acher, Mullette, & Eggert, 1987, as cited in Sents & Marks, 1989) and to have a positive effect on caregivers' ratings of clients' progress in several skill areas (Hulme, Poor, Schulein, & Pezzino, 1983, as cited in Sents & Marks, 1989).

Occupational therapists often devise intervention strategies on the premise that trunk stabilization will increase the effectiveness of a person's hands. The field of ergonomics applies this premise to chair design to improve the posture of the trunk which enhances manipulative skills (Brunswic, 1984, as cited in Noronha et al., 1989).

Although manipulative skills and proximal stabilization are neurologically independent (Kuypers, 1963, as cited in Noronha et al., 1989), manipulative skills depend functionally on trunk and shoulder girdle stability (Stockmeyer, 1972, as cited in Noronha et al., 1989). Noronha et al., (1989) found that the rate of manipulation in upper extremity tasks in persons with cerebral palsy is primarily affected by variations in positioning. In addition, Sents and Marks (1989) found that preschoolers obtained higher scores when tested for IQ's when they were seated appropriately (e.g. feet were flat on the floor, knees were flexed at 90 degrees, back was supported, and forearms rested on the table) then when they were seated inappropriately (e.g. feet were not supported with legs dangling, no back support, table height was too high for child to rest forearms on). The results of a

study by Smith-Zuzovsky and Exner (2004, as cited in Rosenblum et al., 2006) indicated that optimal body positioning is a significant factor in determining performance in inhand manipulation skills, possibly relevant to handwriting performance. It was also observed that children with poor positioning moved frequently in their seats, attempting to find a more stable and comfortable position. Smith-Zuzovksky and Exner suggested that poor body positioning of children in school not only affects their performance due to biomechanical constraints, but their attention to their tasks may have been adversely affected. Another example of the effects in motor skill functioning related to poor biomechanical ergonomics during handwriting performance is that the tendency of a child to make multiple changes in pencil grasps and pencil positioning may be related to deficiencies in fine motor coordination and in –hand manipulation (Cunningham Amundson, 1992; Exner, 1989, as cited in Rosenblum, et al., 2006).

Educating teachers about the importance of ergonomics may play an important role in student educational outcomes. Integrating occupational therapy expertise in the area of ergonomics can concurrently address the occupational performance needs of children with disabilities and those at risk of delay. The blending of teacher education, collaboration, and embedded direct intervention provides a way for therapists to contribute discipline-specific information and strategies needed to enhance specific areas of function that are not necessarily part of a teacher's expertise (Bazyk et al., 2009). This scholarly project will apply positioning techniques and ergonomic information for the purpose of educating teachers and parents on the importance of body positioning and its relationship to fine motor performance. Assistive technology will be considered as another intervention in this project to promote fine and visual motor development.

Assistive Technology

Assistive technology is defined in the Technology-Related Assistance for Individuals With Disabilities Act of 1988 (Public Law 100-147, 1988, as cited in Long et al., 2007) as "any item piece of equipment, or product system, whether acquired commercially or off the shelf, modified, or customized, the is used to increase, maintain or improve functional capabilities of individuals with disabilities" (Public Law 100-407, Section 3 1988, as cited in Long et al., 2007). Occupational therapists often use assistive technology to provide intervention strategies, support the acquisition of new skills increase independence in activities of daily living, and assist children to compensate for impairments (Mistrett, Lane, & Ruffino, 2005, as cited in Long et al., 2007). Over the past several decades, federal legislation promoting the use of assistive technology for children with disabilities has increased. Along with these policy changes, the expansion of new, more sophisticated assistive technology devices has become available. The training of providers currently working with children who need assistive technology devices or services has not kept pace with these changes. Assistive technology devices can range from a simple universal cuff to hold a spoon for a child for self-feeding to sophisticated, computerized communication equipment. Assistive technology services include the services and supports necessary to determine the appropriate technology to meet a person's needs (Long et al., 2007). Infants and children with disabilities have complex needs requiring an array of services. Assistive technology and assistive technology services should be considered a potential component of these services. The use of assistive technology has been shown to improve the quality of life of children with disabilities and increase their access to school and community activities. Also, the

consideration of assistive technology and assistive technology services is mandated by federal legislation (Bryant, Erin, Lock, Allan, & Resta, 1998, as cited in Long, et al, 2007).

The Rehabilitation Act Amendments of 1986 (Public Law 99-506), the Tech Act, The Individual With Disabilities Education Improvement Act of 2004 (IDEA, Public Law 108-446), and the Americans With Disabilities Act of 1990 (Public Law 101-336) all promote the use of assistive technology and assistive technology services for children with disabilities (Long et al., 2007). To increase children's access to and use of assistive technology, the reauthorization of IDEA in 1997 (Public Law 105-17) required that individual education programs (IEP) and individualized family services plan (ISFP) teams consider the need for assistive technology and assistive technology services in the plan at the time it is developed (Long et al., 2007). Despite these mandates, the use of assistive technology has not kept up with the needs of disabled children in the public school setting. Barriers to assistive technology use include service delivery, funding, and technology access. Two broad areas of service delivery deficiency are training support and planning for assessment and implementation (Copley & Ziviani, 2004, as cited in Watson, et al., 2010). The successful use of assistive technology by children is related to the experience, expertise, and attitudes regarding assistive technology and assistive technology services of the service providers (Michaels & McDermott, 2003, as cited in Long et al., 2007). In addition to lack of training in assistive technology and assistive technology services, providers lack confidence in their knowledge and skill level. Because of this, they are often hesitant to recommend or suggest assistive technology strategies (Long et al., 2007). According to social learning theory (Bandura, 1977, as

cited in Long et al., 2007), self-efficacy is related to training and experience; therefore, as experience or training increases, confidence in applying that knowledge should also increase. Occupational therapists, as well as educators providing for the learning needs of children, should be provided on-the-job-training opportunities and gaining knowledge in assistive technology to increase confidence levels. This is consistent with social learning theory.

Service providers can use different models to match a child with technology that would best meet his or her needs. One of these models is the Student Environment Tasks and Tools (SETT) framework. This framework guides a provider to consider the *student's* skills and abilities, the environments in which the student functions, the task the student is trying to complete, and the tools available to bridge the gap between the student's current abilities and the desired activities to be accomplished (Zabala,1995, as cited in Press & Banton, 2007). An outline of the steps using the SETT framework is as follows:

- To gather information about the performance skills the student exhibits, e.g. observable motor and process skills (Press & Banton, 2007);
- 2. To consider the environments in which a student performs. This analysis allows the provider to consider some of the barriers to success in the context in which the student encounters them, e.g. desk and chair height, stability, lighting, cultural beliefs of the student and family, teacher's or parent's comfort level of technology (Press & Banton, 2007);
- To consider the task or activity being performed, breaking it down into its component parts (Press & Banton, 2007) and;

4. To consider the availability of tools that can bridge the gaps among the students' current abilities, the task, and the environment. After pre-technology adjustments and instructional strategies have been considered, technology options are then listed for trial with the student (Press & Banton, 2007).

The goal of assistive technology in the educational environment is to match students to the least restrictive devices that meet their needs. In determining what would be most effective therapists and other team members need to give careful consideration to the student, environment, and the tasks to be accomplished. From there, the team can determine the features of the technology the student may need to access these goals with a plan of action to guide the implementation of these interventions. In this process it is important to remember is that "it is the simplest device that provides access to an activity, without becoming a barrier itself, and the greatest success for the student" (Press & Banton, 2007, p.3). Application to the development of this scholarly project will include the SETT framework for identifying what assistive technology supports may need to be considered for a child to meet his or her learning needs.

Universal Design for Learning

New research on learning and teaching has focused on the diverse ways in which all children learn, not just children with disabilities. One of the most striking approaches that have emerged has been that of Universal Design for Learning (UDL). Based on the principles of architectural universal design at North Carolina State University (The Center for Universal Design, 2008), UDL addresses access to learning for all students, not just students with disabilities. Effective strategies for teaching and learning are particularly relevant, with federal mandates for accountability and the increasing

diversity of learners seen in the educational system today (Post, 2008). Donna Palley, special education coordinator and technology specialist in the Concord, NH, School system described UDL as "the intersection where all our initiatives—integrated unites, multisensory teaching, multiple intelligences differentiated instruction, use of computers in school, performance-based assessment, and others—come together" (Rose & Meyer, 2002, p. 7, as cited in Post, 2008). The most commonly cited definition of universal design is "the design of products and environments to be useable by all people, to the greatest extent possible, without the need for adaptation or specialized design" (The Center for Universal Design, 2008, cited in Post, 2008, p. 1). The goal of UDL when applied to teaching and learning is "to provide students with multiple options for accessing information, engaging with the curriculum, and expressing knowledge, thus meeting the needs of a wide variety of learners" (Post, 2008, p.1). Educational researchers at the Center for Applied Special Technology (CAST) have spent many years studying ways to enhance children's learning through computer technology, and develop strategies for individualizing instruction by using "flexible methods and materials" (Post, 2008, p. 1). According to CAST, learning occurs through the interaction of three primary networks in the brain for processing information and handling learning tasks. Recognition networks, located in the temporal, occipital, and parietal lobes, are the most involved in sensory functions. They enable individuals identify patterns of sensory information and give meaning to them. This information may consist of sounds, light, smells, and taste (Post, 2008). Strategic networks are located primarily in the frontal lobes. These networks are involved in planning, executing, and monitoring our actions, e.g. motor skills, thinking, and learning (Post, 2008). Affective networks, focus on the

emotional aspects of information, such as meaning and importance of the information. Affective networks are widespread, including structure in the limbic system, the frontal lobes, and the hippocampus. These areas of the brain are all involved with emotion and memory formation (Post, 2008). UDL principles recognize that each student "brings a unique assortment of strengths, weaknesses, and preferences" (Rose & Meyer, 2002, p. 38, cited in Post, 2008) to the learning experience. Responding to these differences requires flexibility in teaching methods and instructional media used in the classroom. For example, information presented verbally is challenging for children with hearing impairments or who have auditory processing impairments. Visual text presents challenges for children with low-vision or visual-perceptual issues. Children with motor impairments may need adaptations to drawing or cutting implements for participation in a learning activity. Children's level of engagement with the material and methods of practicing and demonstrating knowledge and skills also vary widely based on what they already know and understand and what their school and home environments have provided.

Occupational therapists can suggest ways for children and teachers to participate in learning that incorporate the three principles of UDL (Post, 2008). The first principle is to provide multiple, flexible methods of presenting information. This principle can be described as the "what" of learning "by supporting those aspects of learning that rely on recognition networks" (Post, 2008, p. 2). The second principle is "to provide multiple, flexible ways for children to express themselves and demonstrate learning by doing. This supports strategic learning, or the 'how' of learning" (Post, 2008, p. 2). The third

principle supports affective learning. This is the "why" of learning, demonstrated by multiple, flexible options for children to become engaged with learning (Post, 2008, p. 2).

The combination of occupational therapy services and assistive technology use promotes engagement of children areas of occupation (Shannon, 2006, as cited in Post, 2008). Occupational therapists' can determine activity demands, identify client factors, and consider environmental and other contextual demands to match assistive technology to a child's needs so that he or she can compensate, adapt, and participate in the their occupation, the role of a learner and student (Cook & Hussey, 2002; Michaels & McDermott, 2003, Zabala, 1995, as cited in Post, 2008). Therapists consider a broad range of tools from low tech to high tech and from customized to mass-market devices. For many children, the foundation for all other assistive devices is equipment and strategies used for positioning, seating and functional mobility. Once stable positioning is in place, the need for other assistive technologies can be assessed. Low tech adaptations that support active participation in educational activities include pencil grips, adaptive scissors, or large-print materials; access to the computer through adaptive keyboards and cursor-control devices such as mouse, track ball, track pad, eye gaze; standard computer-access features such as disarming the repeat function; and adaptive software for outlining, word prediction, writing with pictures or symbols. Children with motor, visual, auditory, and communication impairments could benefit from many of the available assistive technology products on the market. This project intends to promote further the use of assistive technology to enhance children's fine and visual motor skill development by educating parents and teachers with examples of technological resources available for integration into the child's daily tasks.

The academic, environmental, functional, perceptual, cognitive, social, vocational and behavioral issues that surface when evaluating students with impairments within their natural settings and with the caregivers who provide valuable information about the child's functional skills are critical in assuring appropriate assistive technology choices. Integration of assistive devices into the classroom will be enhanced if the needs assessment occurs within the home or educational setting where the child is engaged in his or her occupation as a learner (Schuster, 1993).

In a position statement on its long-range goals, RESNA (an Interdisciplinary Association for the Advancement of Rehabilitation and Technologies) purported that:

"Integration is one of *the* most important national issues in the field of special education technology today. The full power of assistive technology is rarely achieved in the nation's schools because teachers and other service providers lack knowledge of strategies that provide for *true* integration of technology into the existing curriculum...If assistive device were successfully integrated, they would be more readily available, more accessible, and used across all relevant areas of a student's Individual Education Plan." (RESNA Special Group on Special Education, 1991, pp. 7-8, as cited in Schuster, 1993)

Supporting Parents and Teachers

Occupational therapists must embrace opportunities to empower families and support teachers to facilitate children's development and learning in the home and community settings. Therapists can help caregivers increase their knowledge of child development and provide alternative strategies for children with disabilities. This project is intended to provide parents with intervention strategies they can do at home to build

foundational motor skills their child needs to succeed when he or she transitions to preschool, alternative kindergarten, or kindergarten programming. Further, the intervention strategies provided in the home can also be used in the early childhood academic settings by teachers with struggling students. Because the acquisition of skills can vary from each child as well as teacher expectations, the therapist needs to continue educating caregivers of the importance of motor skill development at the preschool age level.

Since young children frequently display patterns of behavior that may suggest, but do not define, future status, different intervention approaches are needed. In addition to the traditional remediation approach which works to improve areas of difficulty, both compensatory and prevention-intervention models are needed (Dunn et al., 1988). Compensatory is used when disability cannot be significantly changed, regardless of how early therapy intervention begins, and it supports children's efforts to develop independent skills by minimizing the effects of a disability (Dunn et al., 1988). Prevention-intervention is used to address children who may be at risk for developmental delays. This approach establishes an enriched learning environment for children to decrease the long-term effects of potential risk factors impeding development (Dunn et al., 1988). Careful programming of designed activities in the home and preschool environments to expand functional capabilities and adapting behaviors help to enable a child to be an active learner. Enriched sensory and motor experiences serve as a foundation for acquiring higher level function and performance competencies within the context of daily living. Structuring and adapting the environment in a way that facilitates learning for the child is important for building the foundational skills needed for

continued acquisition of skills. When purposeful activities are effective, they lead to increased independence and a sense of mastery and self-worth (Dunn et al., 1988).

Summary

This scholarly project will address an area of functioning often overlooked by parents and teachers in the birth to preschool population. Caregivers become consumed with the many needs of a small child—eating, sleeping, safety, and health to name a few, without giving a great deal of thought to developmental stages of growth. Walking and talking become the milestones most caregivers look for as indicators of normal development. Fine motor and visual-motor development are not often areas of concern, until a child enters preschool. At this transition, many changes are taking place. The child is now expected to interact with peers through play, sharing, and conversing. The demands from the environment continue to expand, and expectations increase. The child is expected to color, cut, and glue a simple picture. He may be asked to draw picture of himself by his house, or print his first name. Various toys and objects in this new setting require the use of hand skills he may have had minimal or no experience using before. The teachers, and often the parent, request the services of an occupational therapist to assist with the struggles he is having. Often, these requests appear to carry an element of 'surprise' that he is unable to participate in fine motor tasks successfully. Parents often asked: "what can we do to help?", or "what should we have done to prevent this?" Teachers are just as concerned, but in addition, turn to the district curriculum and point out how discrepant he is from his peers based off of the classroom standards being used. Many of the standards used to show progress are vague, e.g., student will hold a writing utensil for use, or student displays an interest in scissors use. Teachers often accept any type of grasps, e.g.,

gross grasp, pronated grasp, etc., as acceptable for documenting on the curriculum measure, even though the child is unable to complete tasks that require this fine motor skill. In addition, the child is developing habits that are neither efficient nor effective for his participation in fine motor skill building. Displaying an interest in scissors use does not indicate that a child can pick up and position scissors for consecutive cutting. Nor does this indicate whether the child is using his non-dominant hand to hold and turn the paper, or whether his eyes are teaming together to visually track along the line he is attempting to cut. These important indicators of a child's acquisition and mastery of fine and visual-motor skills that lay the foundation for more advanced curriculum-based measures (i.e. handwriting) are a primary source of referrals for occupational therapy services. With this referral is often an expectation that he child will 'qualify for special education'. This is a high-stakes decision that requires an extensive amount of time and documentation, as well as a collaborative of a team of professionals to arrive at a final decision. Placing a child in special education creates a stigma of a disability, not always warranted.

This scholarly project will attempt to fill a gap of knowledge that many teachers or parents are unaware of, yet so crucial to a child's development. Many fine and visual-motor skills can be developed by structuring play time or providing opportunities for a child he may not otherwise be exposed to. By providing parents and caregivers with resources that they can implement with their child, occupational therapy can help prepare a child for the rigors of the academic setting. What this project hopes to do is eliminate the need for continued special education through the elementary school years for many children identified with motor skill delays.

By incorporating fun, valuable learning opportunities for the child, these important skills can be taught, practiced, and generalized to various contexts. When mastery of these skills is demonstrated, the child will not need to be a special education statistic. More importantly, the child will be proud of his accomplishments, and be successful in his occupation as a student. This scholarly project will be a valuable resource for therapists to use to educate parent and teachers of children ages birth through preschool in facilitating fine and visual-motor skills needed for the child's successful participation in the educational setting.

Chapter II consisted of a review of literature on the topics of fine and visualmotor development and the impact delays in functioning can have on school performance. Examples of assessments used to identify delays in performance were outlined. Home and school environments were discussed as important contexts in which fine and visual-motor skills can be developed within the birth through preschool ages. Collaboration with parents, teachers, and the educational team was presented. The Ecology of Human Performance frame of reference was identified as best supporting children (person) in their home or school (environment) and performing their occupational roles (context). Piaget's Cognitive Development Theory and Erickson's Psychosocial Model of Development were applied to the early developmental years. Cultural and socioeconomic implications on children's development and learning were addressed. Lastly, examples of intervention approaches used by occupational therapists to positively impact children's delays in fine and visual-motor development were provided. These approaches included ergonomics, assistive technology, and educating teachers and parents with what they can do to incorporate opportunities for development

of skills within the child's natural environments. In Chapter III, the methodology used to develop the product of this scholarly project will be described.

CHAPTER III

METHODOLOGY

Chapter III is comprised of the methods utilized to implement the literary evidence presented in the literature review in Chapter II of this scholarly project. The process used in building the product for this scholarly project, *Promoting Fine Motor and Visual-Motor Skill Development in Preschool Age Children*, has been described subsequently.

The primary methodology used to create this product included a comprehensive review of the literature including research, textbooks, and existing curriculums used in the preschool setting. The literature review revealed that during the preschool years of a child's life, important gains are made in hand skills that lay the foundation for success in many areas of school function (Bazyk et al., 2009). When a child is experiencing difficulties with his or her ability to engage in everyday occupations and participate in activities involving fine and visual-motor skill capacities, occupational therapists are often called upon to assist in helping the child gain the necessary skills to further his or her development. As a practicing occupational therapist in the school setting, this need area is brought to my attention continually from teachers, parents, and special education staff. Their requests in asking how they can help teach and model effective ways to help children build these foundational skills prompted the development of the product, *Promoting Fine Motor and Visual-Motor Skill Development in the Preschool Age Child.*

Along with the review of past and current literature, I examined the preschool curriculums being used and the expectations teachers have in order for a child to be successful in the preschool setting. For example, the Creative Curriculum is a teacher assessment tool that addresses four areas of development: social/emotional, physical/motor, cognitive, and language. Teachers make ratings of each child three times during the school year. I reviewed the many parent concerns related to questions posed as to what strategies they could implement with their child to better prepare him or her for the demands of the school programming. Throughout this process, I could not locate a concise source that outlined what parents and teachers were asking for that outlined fine motor and visual-motor development from birth through the preschool years and activities that would benefit a child's acquisition of these skills. Additionally, requests for websites and technology applications that can be used as intervention techniques were another catalyst to create this product.

A search for literature was conducted utilizing databases accessed through the Harley E. French Library of the Health Sciences at the University of North Dakota School of Medicine and Health Sciences. Literature was also located using the American Occupational Therapy Association professional journal, the American Journal of Occupational Therapy (AJOT). Communication with the Assistive Technology Department personnel at Grand Wood Area Education Agency (GWAEA) provided resources identifying websites and technology applications specific to this projects intention. I also attended five sessions on Century 21 Learning provided by GWAEA to further my knowledge on technology interventions for students.

The literature that was reviewed and the identified need from caregivers supported the creation of this product. The categories addressed and outlined in this project include: the importance of fine and visual-motor skill development in the early ages, occupational therapy's role in the educational setting, the Ecology of Human Performance (EHP) framework as a basis for the development of this project, cultural aspects of development, and intervention approaches for both the home and school environments.

The product created from the literature review and analysis of caregiver requests resulted in a program that can be used by occupational therapists to educate the needs of this population. Six *Learning Opportunities* were developed. Each of these Learning Opportunities outlines typical skills emerging at that age of a child's life. Learning Opportunity I, II, and III identify developmental milestones during the first, second, and third years of a child's life. Learning Opportunity IV, V, and VI consider the child's development from ages three, four, and five years.

Each Learning Opportunity identifies suggested activities that have been beneficial in promoting fine and visual-motor skill development in my own practice as an occupational therapist. Activity suggestion sheets are included for the participants to reflect and add their own ideas to incorporate with their child's development. Parent and teacher questionnaires, suggested web sites for activity-based learning, educational materials, and applications for iPods and iPads are listed in the appendices.

The product is the result of a critique of available resources to facilitate fine motor and visual-motor skills when a critical window of opportunity exists in a child's life. It is at this young age when foundational skills are being laid that build on the child's future

learning, participation, and successful engagement in occupation. A description of Promoting Fine Motor and Visual-Motor Skill Development in the Preschool Age Child has been included in Chapter IV.

CHAPTER IV

PRODUCT

Chapter IV is comprised of the product of this scholarly project, a guide that consists of information that may be used by occupational therapists to inform and instruct caregivers of children from birth to 5 years of age in the developmental sequence of motor skills. This chapter provides examples of playtime activities for both home and school contexts that facilitate these foundational skills of learning.

Promoting Fine Motor and Visual-Motor Skill Development in Preschool Age
Children was created to be used as a teaching and instructional guide for parents,
teachers, and caregivers of preschool age children. The purpose of this document is to
provide information about motor skill development and resources that adults can use in
promoting fine motor and visual-motor skill development to the infant, toddler, and
preschool age child. It is intended to be a resource from which occupational therapists
can use to educate caregivers of children in the early developing years of the importance
of these skills. Activities and interventions are included at each age of development for
the caregiver to take on an active role in facilitating these skills. This resource is divided
into six categories called Learning Opportunities.

Learning Opportunity I addresses fine and visual-motor skill development from birth to age one year. An overview of the sequence of development of the child at this age has been provided. Activities for promoting continued development have been included.

Learning Opportunity II consists of fine and visual-motor skill development in the child aged one to two years; Learning Opportunity III addresses the child's development from age two to age three; Learning Opportunity IV focuses on fine and visual-motor skill development in the child from age three years to age four years. Learning Opportunity V provides an overview of the child aged four years to age five years; and lastly, Learning Opportunity VI addresses the development of the child from age five years to age six years.

Each Learning Opportunity contains an overview of typical fine and visual-motor skill development pertaining to that age group. Activity suggestions have been given to enhance the child's learning and development of fine and visual-motor skills appropriate for that age level.

The creation of this project was guided by the Ecological of Human Performance (EHP) framework emphasizing the role of context in the performance of a task. For infants and young children, how and what they learn is significantly affected by the context in which they live and interact with others. The contexts that have been considered for this project are the home and preschool environments. With the focus on context, the EHP framework expands intervention options by outlining five intervention approaches: establish/restore, adapt/modify, alter, prevent, and create (Kramer et al., 2003). By expanding the intervention options, the occupational therapist can look more globally at the situation in which the child can learn, without primarily concentrating on "fixing" the child. With this understanding, the occupational therapist can educate caregivers in providing enriching experiences for the preschool age child to develop motor skills necessary for his or her future success in the academic setting.

This project is intended for occupational therapists to use as an instructional tool when educating parents, preschool teachers, or other caregivers involved with the nurturing and development in the birth through preschool age population. Teaching can be adapted to using whichever learning opportunity category or categories, divided by ages, best meet the intended audience's needs.

A complete provision of this product is located in the appendix. Chapter IV consists of six Learning Opportunities that outline fine and visual-motor development in children from birth to 6 years of age. Chapter IV also includes activities for home and school that promote motor skill development that caregivers can provide in the home, daycare, or preschool settings. Chapter V consists of a summary of the purpose of this project, the project limitations, suggestions for how this project could be implemented, and recommendations for future development.

CHAPTER V

SUMMARY

Performance expectations for children at the preschool level continue to increase as curriculums become more focused on academics, early literacy, and motor skill performance. The purpose of this scholarly project is to provide a resource for occupational therapists to use when instructing parents and preschool teachers in promoting fine and visual-motor skill development in children in the birth through preschool age population. A manual was developed to guide the instruction process. This manual has been categorized into Learning Opportunities, which outlines fine and visual-motor skill development for each year from birth to age 6 years. Included in each Learning Opportunity are suggested activities that caregivers for this population can provide to facilitate a child's growth in fine and visual-motor skill development. The Learning Opportunities can be adapted to address the audience's needs; for example, instructing a group of parents with infants and toddlers, only the first three Learning Opportunities would need to be used. The implementation of this product could be used as training sessions for parents when their child is transitioning to preschool, or from the preschool setting to alternative kindergarten or kindergarten programming.

The profession of occupational therapy is continually evolving and changing to meet the occupational needs of children as curriculum expectations continue to place increasing demands on children's performance in the academic setting. The Creative Curriculum is an example of a teacher assessment tool to monitor a child's developmental progress and mastery of content knowledge and skills. The Creative

Curriculum Gold expands the teacher assessment to more specific levels of a child's overall functioning (Heromen et al., 2011).

This manual in intended to assist caregivers of the birth through preschool age population to obtain a better understanding of the developmental process and needs of young children and the importance of facilitating these foundational skills. This manual provides a guide for the occupational therapist to use when instructing parents and teachers, with flexibility in presenting using handouts, lists of resources, and a PowerPoint for guiding the presentation. The participants are encouraged to provide additional activity suggestions during partner or small group interaction time, which is incorporated into each Learning Opportunity. The Parent Questionnaire and Teacher Questionnaire forms have been included to address additional concerns or child-specific needs not otherwise addressed.

Changes to the manual will likely be made following initial presentations made to audiences addressing the birth to age three years population, and the preschool to kindergarten population. Additional research in the area of fine and visual-motor development and how these motor components affect children's performance in school is also needed.

The limitations of this project are reflected by the limited availability of current research in child development and that alignment with the performance expectations placed on children at younger ages. Additionally, instructional materials for adapting and accommodating for the needs of the handicapped or atypically developing child is also limited.

It is my hope that occupational therapists whose passion it is to serve and promote the development of the child use this manual to enhance the training of parents and teachers equipping them with knowledge and understanding in how they can facilitate a child's successful participation in daily occupations and promote the child's independent functioning both in the home and school environments.

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Appendix

Promoting Fine Motor and Visual-Motor Skill Development in the Preschool Age Child

Promoting Fine Motor and Visual-Motor Skill Development in the Preschool Age Child



(Photo courtesy of Microsoft Clip Art)

By Patricia J. Soldner, MOTS, OTR/L Advisor: Anne M. Haskins, PhD, OTR/L

Table of Contents

Introduction	1
Learning Opportunity I: Birth to Age One year	3
Developmental overview	3
Activities to promote development	7
Learning Opportunity II: Age One to Age Two Years	10
Developmental overview	10
Activities to promote development	13
Learning Opportunity III: Age Two to Age Three Years	16
Developmental overview	16
Activities to promote development	19
Learning Opportunity IV: Age Three to Age Four Years	22
Developmental overview	22
Activities to promote development	25
Learning Opportunity V: Age Four to Age Five Years	28
Developmental overview	28
Activities to promote development	31
Learning Opportunity VI: Age Five to Age Six Years	34
Developmental overview	34
Activities to promote development	37
Appendices	
Appendix A: Parent Questionnaire	40
Appendix B: Teacher Questionnaire	41

	Appendix C: Resources for Materials	42
	Appendix D: Handwriting Related Accessories	43
	Appendix E: Resources for Activity Ideas for Preschool Age Children	44
	Appendix F: Resources on the Web for Preschool Activities	45
	Appendix G: Apps for iPods & iPads for the Preschool Age Child	46
,	Appendix H: Power Point Presentation: Birth to Age Six Motor Development	.50

Introduction

"You can teach a student a lesson for a day; but if you can teach him to learn by creating curiosity, he will continue the learning process as long as he lives."

~ Clay P. Bedford

The information in this presentation will provide caregivers of infants through preschool age children with an understanding of the stages of fine motor and visual-motor development during these first few years of the child's life. The goal of this project is to provide occupational therapists with a resource that can be used to educate parents, preschool teachers, or other caregivers of children in the birth through age five years population the importance of promoting the development of these skills as the child grows. Researchers in child development acknowledge the caregiver-child relationship always evolving and reciprocal in nature (Anderson & Hinojosa, 1984). This fluctuating system is influenced by the on-going growth of the child and the caregiver's developmental process (Bradley et al., 1979; Clarke-Stewart, 1973; Mahler et al., 1973, as cited in Anderson & Hinojosa, 1984).

Occupational therapists have knowledge of child development and have been trained in providing intervention techniques to enhance the development of motor skill acquisition, with fine and visual-motor skill development as the focus of this project. This focus area is being emphasized to address the higher level of performance that children are expected to be at when entering kindergarten and the early elementary grades when fine motor skills are involved. These skill areas may include journaling, drawing, cutting, and coloring, as well as self-care expectations with independence for zipping, buttoning, or tying of shoes.

Occupational therapists practicing in the educational setting can assist caregivers (e.g. parents, teachers, staff in the preschools) in helping assist the child with opportunities for facilitating fine and visual-motor skills during this important stage in a child's growth. This will better prepare the child for meeting the expectations of the curriculum once he or she begins kindergarten.

The development of this project was based on the Ecology of Human Performance framework. This framework is built on the constructs of person, context, task, and performance. (Kramer et al., 2003). Occupational therapists must keep all these components in mind when providing interventions to facilitate a child's learning. A therapist should also be able to instruct those who interact daily with the child to continue those interventions to allow the child to practice emerging skills. Once mastery of a newly learned skill is demonstrated, the child will then be better equipped to perform that skill in other contexts. This will greatly enhance the child's independence, success in completing a task with efficiency, and promote positive self-esteem. The EHP framework is intended to as a means to facilitate collaboration which is significant when addressing the developing needs of a preschool age child. Parents, teachers, day care providers, and the occupational therapist must work collectively in providing quality interventions and positive learning opportunities to best meet the child's developmental needs.

The six learning opportunities of this project are intended to be an informational guide for occupational therapists to use in providing education to caregivers of typically developing children and children demonstrating delays in the areas of fine and visual-motor development. It is hoped that the content of this project will provide information that is useful in promoting skill development in the early years of a child's life.

Learning Opportunity I: Birth to Age One Year

"Babies are such a nice way to start people" ~ Don Herrold



(Photo courtesy of Microsoft Clip Art)

Developmental Overview

Parents can most often identify when their baby first rolled, crawled, stood, and walked. *Gross motor skills,* such as these, are the large movements that a baby performs with most of his body. The development of gross motor skills is easy to identify. These are often the skills parents think of in relation to their child's development.

Fine motor skills are the way in which we use our fingers, hands, and arms. This includes reaching, grasping, and manipulating objects. Until a child reaches preschool age when he or she begins practicing coloring, cutting, drawing, and

writing, fine motor skill development is often overlooked during the infant and toddler years.

A baby is born with the capability to grasp. This is not a learned skill, but a reflex that will eventually become deliberate. Practicing movements again and again strengthens the muscles and the nerve pathways to refine the movements for more purposeful grasp (The Wonder Years, 2006).

Birth to Four Months

Between these months, babies will move their arms and hands together to swipe at objects or visual stimuli. Babies also develop the ability to move their eyes and head together from side to side. This is needed for further development of fine motor abilities. For example, turning to the right or left in response to a sound or a familiar voice. Between two to three months babies will begin to reach for objects near to them and grasp tightly. At this point, babies are not able to voluntarily release their grasp. Between four and six months, a baby develops control of grasp (Henderson & Pehoski, 1995). During this time, babies' eyes are beginning to focus better, especially peripherally. This increases the ability to learn from seeing. Babies will gaze more intently as their vision improves. Babies particularly like to gaze at human faces and their own hands (Parents Magazine, 1998).

During this same time frame, *hand-eye coordination* also is developing. Babies will being grabbing/swiping at objects within their sight. By four months, most babies can grasp hold of the object, looking only at the object but not at their hands. Fine motor skills rely on hand-eye coordination to adjust reach by gauging the distance accurately and moving the hand to where the object is (The Wonder Years, 2006).

Four to Twelve Months

This time frame marks another stage of tremendous growth and learning. Babies gain more control over their arms and begin to visually attend to object, reaching with one hand instead of two. Purposeful movement is demonstrated as babies can grasp and hold objects. Around four months, babies grasp and hold with a closed fist. This is called the palmar grasp (Henderson & Pehoski, 1995). By six months, babies will begin to pick up small items. By 8 to 10 months, a finger grasp emerges. Objects are then gripped with all four fingers pushing against the thumb. A baby will use both tactile and visual information to become skilled in adjusting the hand to fit the object (Henderson & Pehoski, 1995). As the baby looks toward the object, he or she will prepare the hand to hold the object by opening and shaping his or her hand before touching the object according to the size or shape of the object (Corbetta & Mounound, 1990, as cited in Henderson & Pehoski, 1995). By 12 months babies will pinch and hold small objects between their thumb and index finger. This is referred to as *pincher grasp* (Henderson & Pehoski, 1995). This refined grasp allows the baby to grasp and manipulate objects and drop them, if desired. By 12 months, babies are looking at objects held in two hands, stacking, and placing objects inside of containers.

Fine motor control develops from the center of the body outward. This means that babies are better able to control arm movements before finger movements. Once a baby can grasp and hold on to an object, he or she will begin to turn it around in his or her hand and pass it between their two hands (The Wonder Years, 2006). The achievements of these basic fine motor skills are the foundational skills needed to for more purposeful tasks such as holding books, building with blocks, coloring, holding a spoon for feeding or a cup for drinking, as examples.

Listed below is a brief overview of some key fine motor skills and the approximate age when these skills are acquired:

2 months- Becomes aware of own fingers;

3 months- Holds rattle briefly when placed in baby's hand;

4 months- Shakes rattle to make a noise;

5 months- Gets hold of an object using palmar grasp, grabs toes and brings to mouth;

6 months- Reaches with one or both hands for a toy, passes objects from hand to hand;

7 months- Starts to hold a spoon, holds a two-handled cup for drinking;

8 months- Starts to use a pincher grip;

9 months- Will let go of a toy voluntarily; points at objects, claps, waves bye-bye;

10 months-Bangs objects together, pincher grip is more refined;

11 months- Enjoys passing objects back and forth;

12 months- Refined pincher grasp is used, holds two objects in one hand, puts objects into a container, better a using a controlling a spoon, may throw objects with little control or direction, looks at objects that are dropped (The Wonder Years, 2006).

Next, we will learn of specific activities that caregivers can do to help develop fine and visual motor skills during the first year of life.

*******************************Notes/Questions*******************

Activities:

Birth to Age One Year

"I brought children into this dark world because it needed the light that only a child can bring." ~ Liz Armbruster



(Photo courtesy of Microsoft Clip Art)

The development of skilled hand use requires infants to bear weight on their arms and legs and explore their environment by touching and having opportunity to manipulate various objects with both hands.

 Tummy Time: The American Academy of Pediatric Task Force (1992), suggested that babies should sleep on their backs to prevent Sudden Infant Death Syndrome (Zachry & Klitzman, 2011). While awake babies should be placed on their tummies to encourage pushing up on their forearms, and eventually their hands.

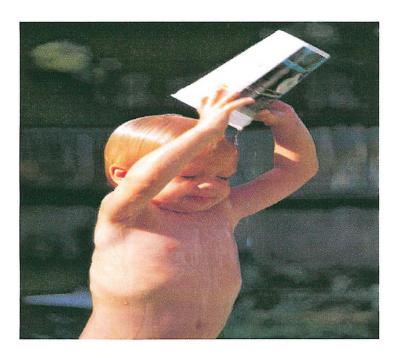
- Placing a mirror or toy in front of them will encourage the infant to visually attend to an object, support their head, and strengthen their upper body.
- A rolled up towel or small pillow can be placed under baby's chest for upper body support.
- Encourage visual attention and reach by entertaining babies with rattles and small, easy to grasp objects and toys. This can be done with the baby on his tummy or back.
- Allow baby to gaze at your face; talk or sing quietly draw their gaze to your mouth and lips.
- Hang a mobile in the crib to encourage eye gaze and visual tracking.
- Mirrors can be attached to crib railings at a level for the baby to see himself, once he can roll to his tummy and scan.
- Place a stuffed animal in the corner of the crib to encourage reach and gaze.
- Gently open baby's hands and stroke with various fabrics (fake fur, corduroy, silk, fleece, etc.).
- Provide various toys to look at and touch with bright, contrasting colors.
- Filling and Dumping: Older babies enjoying filling containers (such as a small box or pail) with small objects, then dumping the contents out. He will enjoy practicing grasping, releasing, and visually attending to objects.
- Vary toys periodically, so new learning can occur. Everyday items such as plastic bowls, lids, a shoebox, or a wooden spoon can become a source of enjoyment and intrigue to a curious baby.
- Keep a variety of safe objects for baby to hold such as small books, soft blocks, plastic measuring spoons, empty containers, rattles, squeeze toys, and balls.
- Activities that encourage using both hands together, such as holding a
 medium sized ball or stuffed animal becomes a very important skill later
 on when he needs to hold the paper while coloring, stringing beads, or use
 both hands when cutting.

- Once a baby becomes more mobile by rolling or crawling, place toys just out of reach at various distances, but not always directly in front of the baby.
- Encourage infants to look to the right or left, and use their hands and eyes together to retrieve toys from various angles.
- Play pat-a-cake with your baby, model clapping when you give praise.
- Encourage crawling to promote upper body strength, reciprocal movements of arms and legs, and weight bearing on the palms of the hands.

*List of activities suggestions created by Patty Soldner, OTR/L ~ 2011

Learning Opportunity II: Ages One to Two Years

"While we try to teach our children all about life, Our children teach us what life is all about." ~ Angela Schwindt



(Photo courtesy of Microsoft Clip Art)

Developmental Overview

The infant of last year is quickly becoming a toddler, as he gains better trunk control for standing, moving along furniture, and taking a few tentative 'first steps'. At this age, hand and arm use is seen with the whole arm moving smoothly together and both arms being used equally. Throughout this year the child will begin using one hand to hold an object, while the other hand manipulates (Henderson & Pehoski, 1995). For example, the child begins to spoon feed with one hand while the other hand holds the bowl. As the child approaches the end of this year, the use of one hand over the other emerges. Although hand dominance is not fully demonstrated until about three years of

age, toddlers usually begin to show a preference for using their right or left hands at around eighteen months. By age two, toddlers tend to use their preferred hand for most activities (The Wonder Years, 2006).

Toddlers at this age are developing the ability to manipulate objects with refinement, including activities such as twisting dials, pulling strings, pushing levers, turning the pages of a book, and beginning to use crayons for scribbling. Two-handed movements occurring at the same time is representative of a developmental step needed for the child's refinement of fine motor skills (Henderson & Pehoski, 1995).

Hand use at this age changes. Toddlers begin to move their fingers separately from their other fingers. They may poke at things or point at objects. When an interest in coloring begins, toddlers will use their whole arm movements, with the crayon held in a closed fist position. Typically, toddlers coloring will progress from a circular scribble pattern to either a horizontal or vertical scribble. Scribbling can provide an excellent way for improving how the eyes and hands are working together (Klein, 1990). Toddlers at this age may scrawl back and forth making an occasional semi-circle, like that of a wiper-blade. As the toddler approaches two years of age, greater control will be evident with the crayon held between the thumb and pointer fingers and better control of the arm movements may be seen (Parents Magazine, 1998).

As the toddler's fine motor skills improve, he or she will be more efficient at grasping small objects with the thumb and pointer finger. This skill allows the toddler to manipulate small objects, place pegs in holes, and cover/uncover containers with lids. The toddler will engage in more complex play for longer periods of time that involve hand skills used in pushing, pulling, probing, rotating, and turning (Nicholich, 1977, as cited in Henderson & Pehoski, 1995). At this age, toddlers enjoy playing with several smaller objects, such as blocks. Toddlers enjoy removing small objects from a container, then place them back in

again. <u>Precaution:</u> Make sure objects are not small enough to be a choking hazard.

By age one, a toddler is using his index finger to point things out that he finds interesting. Naming the object for them will enhance their knowledge and language acquisition. During this year, the toddler may make attempts to name an object they have heard you say. This helps develop his fine motor and visual motor development as he uses eye-hand skills to locate objects of interest (The Wonder Years, 2006).

By 18 months, toddlers have great interest in books. They are able to turn the pages of a book, while holding with the other hand. Often, they will turn more than one page at a time, until they reach age two, when the refinement of fine motor development allows more accuracy in turn single pages. As they turn pages and use their eyes to scan and locate pictures of interest, the toddler is further developing eye-hand skills in preparation for reading (The Wonder Years, 2006). By the end of the second year, the child is demonstrating more complex hand and motor patterns, such as stacking blocks or placement of puzzle pieces (Henderson & Pehoski, 1995).

Around two years of age, toddlers become interested in turning knobs. Learning this turning movement means the toddler is also beginning to unscrew lids (The Wonder Years, 2006). This turning of the hand with the palm facing upwards is called *supination*. Turning of the hand so the palm faces downwards is called *pronation*. This motion becomes important for scooping food with a spoon and bringing the spoon to the mouth. The movements of pronation and supination also become important for cutting skills later on.

Let's look at some activities that assist in the development of fine and visualmotor skills during the second year of life.

Activities:

Age One to Two Years

"There are no seven wonders of the world in the eyes of a child.

There are seven million." ~ Walt Streigtiff



(Photo courtesy of Microsoft Clip Art)

- Have toddlers push and pull large boxes and weighted containers around the floor or outside. This promotes shoulder and arm strength.
- Provide pull-toys or simply attach a string of yarn to a plastic car or toy with wheels.
- Push toys such as play strollers, shopping carts, etc.
- Provide blocks, cups, or Lego's to stack. This stacking and building skill improves dexterity, control, spatial awareness and visual skills.
- Nesting toys are a favorite at this age. This allows for either stacking or putting one inside of another.

- Provide shoeboxes, large mixing bowls, or other simple containers for putting smaller objects in and taking out.
- Toys that provide placement of rings on spindles.
- Provide books with thick cardboard pages.
- Toys or items with lids that require twisting on an off, or pulling up to open.
- Choose toys that have knobs to turn, levers to pull, or buttons to push.
- Toys that light up, flash, or play music are engaging for a child of this age.
- Wash a toddler's hands with foam soap and teach him to rub hands together.
- Let your toddler 'paint' with non-toxic finger paints, pudding, or whipped cream on a cookie sheet or in a baking pan.
- Begin allowing your toddler to scribble with markers and crayons.
 Sit him in his high chair with a large paper taped to the table and let him scribble with different colors. Help him make dots, lines, and circles on the paper.
- Encourage throwing of appropriate objects such as small balls or bean bags, either at a target (i.e. a box) or to a person.
- Clapping to music, or rhymes and music with arm and finger actions are encouraged.
- Simple musical toys such as a play piano keyboard, drum, or tambourine.
- Toys that require simple hammering or pounding.
- Small rocking or scooting toys where hanging on to a handle or steering wheel.
- Encourage outdoor play rolling and throwing balls.
- Swinging.

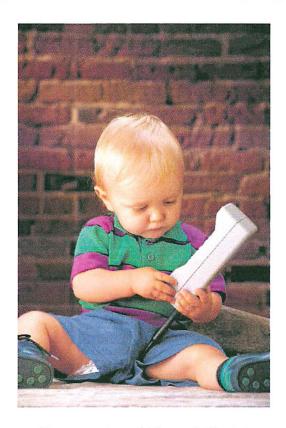
 Laundry baskets or boxes that a toddler can climb into. This play involves large motor skills along with various hand grasps and arm movements.

*List of activities suggestions created by Patty Soldner, OTR/L ~ 2011

♣ Partner or in a small group brainstorm additional activities

Learning Opportunity III: Ages Two to Three Years

"If children grew up to early indications, we should have nothing but geniuses." ~ Johann Wolfgang von Goethe



(Photo courtesy of Microsoft Clip Art)

Developmental Overview

A two-year-old continues the transformation from toddler to child. Early challenges such as walking and grasping objects have become routine. A two-year-old is ready to learn new, more complex skills as he further refines existing ones (The Parents Answer Book, 1998).

During this age of development, a child's balance and trunk stabilize, supporting his posture. This allows the child to reach away from his body or shift his weight to one side. When using his hands, less movement will be seen at the shoulder with more movement occurring at the elbow (Klein, M., 1990). The child may favor one hand over the other, yet hand dominance may not yet be fully established. Alternating use of one hand over the other is still common at this age.

Skills involved in activities involving grasping and pointing show marked progress. Two-year-olds do not clutch objects in their fists, but hold the objects between the thumb and fingers. Two- year-olds may begin grasping zippers to pull up or down, pull their socks on or off, pull up their pants, or attempt buttoning (Henderson & Pehoski, 1995). Children at this age show greater efficiency using a spoon or fork to feed independently. This is a good age to begin allowing the child to brush his teeth and comb his hair with moderate supervision (Parents Magazine, 1998).

When drawing, a child will tend to hold a crayon or marker with his fingers pointing towards the paper. This is called a *pronated grasp*. During this year the child will be capable of drawing a vertical line, a horizontal line, and a circle after first watching it being done. This is called *imitation*. As the child gets closer to age three, he should be able to draw the same shapes just by looking at a picture. This is called *copying* (Marsh, 1998).

"Mastering the use of scissors is a necessary component of fine motor skill development in children, which occurs during the preschool years" (Schneck & Battaglia, 1992, p. 79, as cited in Marsh, 1998, p. 17). When using scissors, a two year old will generally use both hands to open and close the scissors. By three years, a child will show snipping of paper (making short individual cuts) with the scissors now positioned in one hand. Eventually, the cuts become longer, and made one right after another called *consecutive cutting*. The child will then enjoy cutting a piece of paper in two. Cutting along lines is not expected at this age (Marsh, 1998).

A two-year-old is now using his hands with improved dexterity. This is allows for movement patterns that allow the child to perform tasks such as stringing large beads, unscrewing jar lids, and cutting play-dough with cookie cutters. As the young child moves about with greater confidence, new learning opportunities abound.

****	*****	**** ***	*Note	e/Ou	etic	ne**	*****	*****	****	****

Activities:

Age Two to Age Three Years

"Every child comes with the message that God is not yet discouraged of man." ~ Rabindranath Tagore



(Photo courtesy of Microsoft Clip Art)

- Toys with knobs that turn, buttons to push, or lids to remove.
- Filling and dumping items in containers; everyday items such as
 plastic lids to milk bottles, blocks, small plastic toys that are not too
 small to be a choking hazard.
- "Painting" on their high chair tray or at the table with pudding, whipped cream, or non-toxic finger paints.
- Stacking blocks or cups or nesting cups one inside the other.
- Allow more independence when washing and drying their hands.
- Toys to pull and push.
- Teach ball throwing, rolling, and kicking.
- Large puzzles with knobs.
- Shape sorters.

- Cars, trucks, trains, or toys that roll.
- Toy musical instruments such as a drum, xylophone, or piano keyboard.
- Supervised use of crayons or markers.
- An easel to stand at for painting or coloring.
- Snap together blocks or large beads.
- Simple board games that involve color or object matching, for example.
- Music tapes or CD's that involve clapping, arm and body movements, or finger play.
- Picking up various dry food items such as various shapes of pasta, and dropping them through a toilet paper or paper towel tube into a container.
- Sorting 2 or three types of dried pasta shapes into separate containers.
- Apply stickers to sticker books, or have the child make his or her own collage of stickers.
- Play Doh or homemade dough activities involving rolling, squeezing, flattening, and cutting the dough with a plastic knife or cookie cutters.
- Placing play coins into a piggy bank.
- Turning cardboard game cards over for matching (i.e. color or object matching).
- Water toys that require filling, pouring, squeezing to fill and empty,
 i.e. eye dropper or food baster.
- Filling and pouring of sand, rice, or dried beans.
- Filling a container with rice or dried beans, then have the child find hidden objects.
- Magnetic letters and numbers on a magnetic surface (i.e. refrigerator, metal desk).

 Removing backing and placing small foam stickers to make a picture.

*List of activities suggestions created by Patty Soldner, OTR/L ~ 2011

♣ Partner or in small groups brainstorm additional activities.

(Begin running Power Point slides 1-12 to begin next section)

Learning Opportunity IV: Ages Three to Four Years

"Always walk through life as if you have something new to learn and you will." ~ Vernon Howard



(Photo courtesy of Microsoft Clip Art)

Developmental Overview

Between the ages of 3 and 4 years, a child's coordination improves so it becomes easier at standing, walking, running, and jumping. Increased coordination allows for the child to ride a tricycle. As coordination of hands, feet, and body improve more activities will be seen such as hopping, standing on one

foot, walking backwards with greater agility. Balance also improves allowing for the child to go up and down stairs without assistance (Parents Magazine, 1998). Children between the ages of 3 and 6 years are improving rapidly with abilities to manipulate objects in one hand (Henderson & Pehoski, 1995). For example, it may still be difficult for a 3-year- old to button with enough speed to make the task functional. The speed at which the task gets done improves throughout this year, so less assistance is needed. Speed alone is not enough; accuracy continues to improve (Bard, Fleury & Gagnon, 1990, as cited in Henderson & Pehoski, 1995).

Typically, fine motor skills of boys and girls are substantially different at this age. Girls will develop the ability to control their hand movements much quicker than boys. Precise movements are now possible for a 3-year-old girl as she gains more muscle control of her fingers and hands. The will be able to throw a small ball, and possible catch a large ball. She will be able to hold a crayon and copy or trace different shapes and maybe some letters. She may also be partly dressing herself by attempting buttons, zippers, and snaps. Boys at this age continue to concentrate on using the larger muscles of their bodies and often are not interested in attending to fine motor activities, possibly for a year or more (Parents Magazine, 1998).

During this year, your child will continue to demonstrate a stronger preference for using one hand over another, although switching hands to do certain tasks or during a task may still continue. Children begin to discover which hand has better control for certain activities. The use of eating utensils, toothbrushes, combs, play hammers, and crayons are tools that allow practice of establishing hand dominance (Klein, 1990). A child at this age should be able to trace and copy a horizontal line, a vertical line, and a circle. Drawings of a person may be a figure with a head and two other body parts. Usually, a three -year -old will not plan what he is going to draw or be able to tell you what he is going to draw but will more likely tell you afterwards what he has drawn (The Wonder Years, 2006).

A three-year-old will attempt to stay within the lines when coloring but may have limited success. The whole arm tends to perform the coloring, widening the area being colored. Many three- year-olds will hold a crayon or marker with a mature grasp, called a *tripod grasp*. This grasp is demonstrated by pinching the crayon between the thumb and index finger and being supported on the side of the middle finger of the hand. The fine motor skills targeted within a preschool program should help the child in refining hand skills for school-readiness tasks such as handwriting, cutting, and coloring (Marsh, 1998).

Children at this age take an interest in cutting. The three-year-old may first hold the scissors with two hands, opening and closing like hedge clippers. With guidance in positioning on one hand, the child will be able to cut along a straight line using small snips, gradually making longer consecutive cuts. Children eyes may not stay focused on the line they are cutting on, but more on the scissors movement. Gradually, they will become more proficient with using their other hand to hold and turn the paper.

Let's look at ways in which to facilitate skills in the three-year-old child.

Activities:

Ages Three to Four Years

"Childhood is the most beautiful of all life's seasons." ~ Author Unknown



(Photo courtesy of Microsoft Clip Art)

- Put together jigsaw puzzles, between 5 to 12 pieces.
- String large beads on yarn or shoe strings.
- Lacing cards.
- Build with blocks, shoe boxes, cups, and small items such as dice.
- Dress up dolls with large zippers, buttons, and snaps.
- Provide dress up clothes for child to pretend play.
- Twist shapes with pipe cleaners.
- Form shapes with wet sand.
- Make dough or purchase Play Doh. Encourage squeezing, rolling, flattening, pounding, and poking.

- Hide small items in dough, such as pennies or beads.
- Roll out dough and make cut-out shapes with cookie cutters.
- Allow child to experiment cutting rolled up dough with small plastic knife.
- Let child play with large mixing bowls, scooping and pouring dry food items such as rice or beans with measuring cups.
- Have child stir using a wooden spoon in a large bowl, i.e. whipped cream with a few drops of food coloring added makes stirring fun.
- Encourage child to color, draw, or paint sitting at table, standing at an easel, or lying tummy down on the floor.
- Provide large simple object pictures to color.
- Encourage child to trace on lines before coloring using a marker,
 then fill in coloring with a crayon.
- Draw in colored sand, shaving cream, or with finger paints.
- Popsicle sticks make great 'pencils' for drawing in the above.
- Provide child-safe scissors for beginning snipping and cutting.
- Begin cutting practice by snipping straws.
- Practice cutting using 5 x 7 index cards, or small squares of construction paper.
- If the child is lifting his or her elbows into the air when cutting, pull
 the child's chair away from the table, and allow him or her to hold
 the material to cut directionally in front of their body; they are more
 apt to position their elbows closer to the body.
- Provide wind- up toys and spinning tops.
- Play hammers, drills, and screwdrivers provide fine motor movements that boys may enjoy versus paper/coloring tasks.
- Colored water in a squirt bottle makes great 'pictures' in the snow.
- Provide water in spray bottle for the child to water the plants or squirt at bath time.
- Sidewalk chalk.

Pails and shovels in the sandbox.

*List of activities suggestions created by Patty Soldner, OTR/L \sim 2011

♣ Partner or on small groups brainstorm additional activities.

Learning Opportunity V: Ages Four to Five Years

The greatest poem ever known
Is one all poets have outgrown:
The poetry, innate, untold,
Of being only four years old.
~ Christopher Morley, To a Child



(Photo courtesy of Microsoft Clip Art)

Developmental Overview

Four-year-olds demonstrate rapid development with large and fine motor skills. This may be seen in the child's ability to manipulate with their fingers. Along with these motor abilities is a longer attention span which allows greater concentration towards mastery of tasks. Age four is probably a good time to have your child's vision and hearing checked. It may not be obvious, but even slight impairments in these areas of function could impede a child's motor progress (Parent's Magazine, 1998).

Hand use at this stage of development is characterized by refined wrist and finger movement, with decreased elbow and shoulder movement. This can be seen coloring, for example. During coloring, the child will become capable of staying within the lines as the child uses more refined movements stemming from the wrist and fingers, compared to movements from the shoulder and elbow. Visual-motor coordination - "the ability to coordinate vision with the movements of the body (Stephens & Pratt, 1989, as cited in Marsh, 1998, p. 20) is an important skill for many functional and educational tasks. The child will most likely be using his or her dominant hand more consistently, and refinement of skills will be obvious as dominant hand begins to exceed the skills of the non-dominant hand. During this year, the child will show more identifiable objects in his or her drawing. Skills developing such as making crosses, diagonal lines, and squares allow for greater creativity when drawing pictures (Marsh, 1998). Children at this age begin drawing persons with a head, adding the body, legs, arms, and even fingers. They can usually draw a simple house. They will probably be able to tell you what they are going to draw before they draw it. This shows an increase in visualizing what it is before they draw it, a development from the previous year (The Wonder Years, 2006). Cutting skills will be improved as the child at this age can visually attend for longer periods of time and visually track with his eyes at the same time his hand working the scissors.

A child's hand coordination should be almost completely developed at this stage. Dressing independently may be achieved this year. Independent use of a toothbrush, spoon, fork, and knife for spreading are functional skills indicating progress with fine and visual-motor development. Providing a variety of activities is important as the four-year-old is discovering more abilities than ever before, and creativity is emerging (Parents Magazine, 1998).

Let's look at activities for home or school for the four-year-old child.

Activities:

Ages Four to Age Five Years

"Life is about using the whole box of crayons." ~ RuPaul



(Photo courtesy of Microsoft Clip Art)

- Allow child to use a paper punch with colored construction paper;
 glue these dots to make a picture.
- Play Doh or Silly Putty (variations: make small balls and press flat.
 between fingers, roll out into snakes, flatten into pizza and cut with a pizza cutter).
- Hide small items in rice or beans; sort items by colors, shapes, sizes, or categories.
- Drawing, painting, and coloring on an easel.
- Wind yarn or string into a ball (variation: glue and wind yarn around a soup can for a pencil holder, or a glue colored craft sticks vertically on a can.
- Clip clothespins on to edge of a box, counting how many fit on each edge (variation: print letter/numbers on the clothespin and sequence in order).

- Have child along lines to make strips and glue strips to make a paper chain.
- Stack smaller objects such as playing dice, coins, or Cheerio's.
- Allow child to practice buttoning, snapping, zipping, buckling, and shoe tying.
- Do wheel barrow walking or imitation of animal walks.
- String various sizes of beads, or pasta that has openings on using pipe cleaners, shoe laces, or yarn.
- Tear colored construction paper or tissue paper and use pieces for making a picture.
- Have child pick up small items one by one and hold in the palm of his hand; have him release each item individually and count, name or sort the items as they are released.
- Games such as Lite Brite, Barrel of Monkeys, Lego's, Tinker Toys, Connect Four, Operation, Memory, Hi Ho Cherry O, Don't Spill the Beans, and Kerplunk require various fine motor skills and positions and are better understand at this age of development.
- Provide a variety of crayons, markers, and colored pencils for tracing, drawing, and coloring.
- Stamps and ink pads to add to creativity to pictures.
- Child safe scissors for cutting; encourage cutting out shapes drawn on index cards or construction paper.
- Have child cut out pictures from used magazines and make a picture collage.
- Have child practice tracing letters, numbers, his name, etc., then try to copy what he has traced.
- Have child use highlighter markers for outlining a picture to be colored then use regular crayons for coloring.
- Encourage the use drawing, letter, and number practice writing on a chalk board and white board.

 Children at this age may have had some exposure to a computer; if available allow limited time for games on the computer using the mouse; also encourage simple use of the keyboard, such as finding and typing the letters of his name. (See Appendix F for suggested computer activities).

*List of activities suggestions created by Patty Soldner, OTR/L ~ 2011

♣ Partner or in small groups brainstorm additional activities.

Learning Opportunity VI: Age Five to Six

"We could never have loved the earth so well if we had had no childhood in it." ~ George Elliot, 1860



(Photo courtesy of Microsoft Clip Art)

Developmental Overview

Physical growth during the fifth year of development is generally the same rate as earlier preschool years. Physical changes may make a child more awkward and less sure of his or her movements. These changes are normal and part of this stage of growth, due to the addition of weight and height (Parents Magazine, 1998). The beginning of this age brings advancement in eye-hand coordination. A child at this stage can direct his hands to move precisely and accurately to do simple tasks. The ability to carry out skilled motor acts in a correct sequence is called *motor planning*

(Benbow, Hanft & Marsh, 1992, as cited in Marsh, 1998). Examples of motor planning tasks within the school setting are copying a shape or letter or sequencing cutting. During the second half of this year, a child may show less self-assuredness as growth may reduce the control he has over his movements. Children can become insecure about they can do as a result (Parents Magazine, 1998).

Visual changes also occur during the second half of this year of development. It is normal to see reversals in letters and numbers during this time. This is not a sign of any learning disability. Eye and hand coordination may become slow and awkward as physical changes take place. The ability to perceive the external world as well as the child perceiving his or her own body is crucial for well-coordinated reaching movements (Henderson & Pehoski, 1995). Children at this age can move their eyes and head together and approach things more directly. A child at this age may not yet be able to smoothly move his eyes from left to right and focus on different things. He will be better able to focus on one stationary object than follow something that is moving. This can be seen when a child this age spends longer periods of time on one activity, with a determined effort to color in the lines, for example (Parents Magazine, 1998).

Precise finger control for coloring, writing, and drawing becomes more evident at this age. Children enjoy copying letters and forming words at this age. By the end of this year of growth, a child will be writing letters, most letters without a model. Drawing skills increase with the ability to form a triangle and diamond shapes (Marsh, 1998). Pictures have added details, such as facial features, ears, and hair on a person drawing. The simple house drawing of last year now takes on the details of a door, windows, roof, and chimney (The Wonder Years, 2006).

The child is more capable of using both his hands together; the dominant hand controlling the crayon or scissors with the non-dominant hand assisting by holding or turning paper. By the end of this year, a child can position scissors correctly and produce more precise cutting on the lines. A child will begin this year capable of cutting out simple shapes, gradually moving to cutting out more complex figures. With practice, children will be able to cut materials such as fabric and string (Marsh, 1998).

Let's look at activities for home or school that can benefit fine and visualmotor skills in the five-year-old child.

Activities:

Ages Five Years to Age Six

"We worry about what a child will become tomorrow, yet we forget that he is someone today." ~ Stacia Tauscher



(Photo courtesy of Microsoft Clip Art)

- Have child make jewelry by stringing pasta, craft beads with letters or shapes, or buttons.
- Make stacking and building with blocks or Lego's more challenging by having the child copy a design.
- Using push-pins or golf tees, allow the child to make designs or copy a pattern by pushing items into Styrofoam.
- Using colored craft sand, place a layer in a baking pan or stove burner covers and have child write or draw in the sand.

- Provide small (approximately 1½ 2 inches) of chalk, crayons, or pencils for use; this reinforces and strengthens a tripod grasp.
- Provide tongs, tweezers or strawberry hullers to pick up and place various objects when counter, matching, or categorizing.
- Use an eye dropper and Q-tip for painting.
- Have child scoop dry beans or rice with a spoon and transfer from one container to another.
- Instruct child in basic American Sign Language letters or signs for activities important to him.
- Line up Dominos in a sequence, both flat and on end to knock over.
- Fill eye droppers with colored water and release and count each drop.
- Hold a flat object (i.e. book or a plate) on the child's upturned hands and ask the child to rotate the object on his fingertips.
- Thread nuts on/off bolts, using various sizes of each.
- Hold two small balls in one hand and try to rotate one ball around the other.
- Squeeze the trigger of a spray bottle in water play, for cleaning off tables, or watering plants.
- Roll small balls of Playdoh between the thumb and index finger.
- Provide small items (coins, beads, plastic chips) and have the child sort and place items one at a time.
- Have child form a 'cup' in the palm of his hand, and slowly pour rice, sand, or dried beans into palm, encouraging him to hold as much as he can.
- Lineup cards, coins, or pokers chips and have the child turn or flip over as many as he can in different time frames (i.e. 10 seconds, 20 seconds, etc.).
- Store various small items used in activities in zip-lock bags; have child open and close bags before and after the activity.

- During water play, have child wring out cloths or sponges.
- Provide various sizes of pegs and pegboards.
- Toy cars that require pull-back and release.
- Encourage coloring, drawing, and writing practice while lying on his tummy or standing at a vertical surface.

*List of activities suggestions created by Patty Soldner, OTR/L ~ 2011

♣ Partner or in small groups brainstorm additional activities.

Show Power Point slides 13-20 here

Appendix A

Parent Questionnaire

In order to better meet your child's educational programming the occupational therapist would like your response to the following questions:

OC	cupational therapist would like your response to the following questions:
1.	What concerns do you have with your child's fine motor skills? (e.g. coloring, drawing, cutting, zipping, etc.)
2.	Does your child enjoy or avoid fine motor activities?
3.	What are your child's interests in games and activities (e.g. board games, outdoor play, computer games, etc.)?
4.	What does he/she perform well at? What activities seem to frustrate him/her?
5.	Are there any questions you have specific to your child regarding fine or visual-motor skills that you would like to discuss with the school therapist?
Name	Phone # or E-mail
Child's n	pame Date of Birth

Appendix B

Teacher Questionnaire

In order to provide better programming for your students the

	cupational therapist would like your responses to the following estions:
1.	Regarding fine motor skill development, what functional skills do you see most students unable to perform? (e.g. zipping, holding a crayon or pencil, tracing, scissors use, etc.)
2.	When teaching fine motor skills, what area (s) would you like instructional ideas in? (e.g. cutting, drawing, etc.)
3.	In your opinion, does age, gender, or background of the child have a significant impact on his/her fine and visual-motor performance? Explain.
4.	How could the occupational therapist in your district support you in providing fine and visual motor skill development for your students?
5.	Do you currently have specific students you would like to discuss with the occupational therapist?

Appendix C

Resources for Materials

Therapro - www.theraproducts.com

- Excellent source of therapeutic fine motor activities, manipulatives and adapted materials
- Adapted scissors and pencil grips
- Wikki Sticks and activities to do

The Therapy Shoppe – www.therapyshoppe.com

A great source of fine motor items at good prices

Pocket Full of Therapy - www.pfot.com.

Source for tongs

OT Ideas - www.otideas.com

A growing source for therapeutic and fine motor ideas

Lakeshore Learning – www.lakeshorelearning.com

Educational manipulatives of varying sizes, shapes, & categories

Abilitations – www.abilitations.com.

Items specific to children with disabilities

School Specialty - www.schoolspecialty.com.

Offers discounts for schools that have contract with the company.
 Pegboards, easels, and chalkboards

U.S. Toys – www.ustoy.com.

- Small items to pick up with tweezers
- Water squeeze toys

Appendix D

Handwriting Related Accessories

(Various pencil grips, adapted writing surfaces, spacers, adapted paper, etc.)

Achievement Products	www.abilitations.com	1-800-373-4699
Handi-Things	www.handithings.com	1-636-398-4081
Integrations	www.integrationscatalog.com	1-800-245-7851
PCI Education	www.pcieducation.com	1-800-594-4263
Sammons Preston	www.sammonspreston.com	1-800-323-6647
Seaboard Pencil Co.	www.seaboardpencil.com	1-800-722-2881
SensoryEdge	www.sensoryedge.com	1-800-376-8250
SmileMakers	www.smilemakers.com	1-800-825-8085
Southpaw Enterprises	www.southpawenterprises.com	1-800-228-1698
WriteEase	www.writeease.com	1-877-245-7851

Appendix E

Resources for Activity Ideas for Preschool Age Children

www.instructables.com

www.toddlerstoday.com

www.lovinghandskids.com

www.playtolearn.com

www.theearlylearner.com

www.toddlerworlds.com

www.abcchildcare.us

www.preschoolrock.com

Appendix F

Resources on the Web for Preschool Activities

www.literacycenter.net.
www.primarygames.com
www.creat-a-reader.com
www.learningplanet.com
www.internet4classrooom.com
www.abe.net.au/countusin/default.htm.
www.funbrain.com
www.fisherprice.com
www.kneebouncers.com
www.education.com
www.zerotothree.org
www.learningtools.us
www.dotolearn.com
www.drjean.org
www.donnayoung.org
www.sense-lang.org

Appendix G

Apps for iPods & iPads for the Preschool Age Child

Preschool age children can practice fine motor and visual-motor skills, as well as participate in valuable learning through the use of these assistive technology resources. This is a sample of applications by category. Many more applications for the iPod or iPad are available at the iTunes Store.

Communication Apps

ABA FlashCards - Actions - In this set of 52 images, learn actions via text and real audio

iSpeech – List of sounds for developmental ages 3 to 7+ and explanations for forming and teaching sounds

iSpeech Toddler Sign – Two animated children Sade and Sammy, animate 30 signs each, with accompanying explanations

Learn to Talk – Over 160 interactive flashcards to learn noun, verbs, early syntax, and word combinations

Model Me Going Places – With 6 locations (e.g. playground) each has photos with narrations of children modeling the behavior

Sign 4 Me – With more than 11,500 words in the library, you can learn signed English from a 3D avatar

Sign Smith ASL – With more than 1,200 sign, you can learn American Sign Language from a 3D avatar

Reading Apps

ABC Animals – Interactive animal flashcards with audio that provide the letter name, associated animal name, and the phonetics

abc Pocket Phonics – Combines the three apps in one with letter sounds, letter writing practice, and 170 first words

Alphabet Animals – All 26 letters in interactive flashcards that make sounds and animations when touched

iLook – High contrast white on black picture book with 5 categories (e.g. animals, food) for young children

iMother Goose – Bugs – Talking picture book with full color pictures that speak the insect name when touched

weesay ABC – Pre-loaded, or create your own album of alphabetical sounds and images using the camera and microphone

Writing Apps

FirstWords: At Home – With pictures of over 30 items around the house, touch a letter to hear it, and drag it to the correct word position

iWriteWords – In easy or regular mode, trace numbers, lower case and upper case letters using numbered prompts.

Word Magic – With a picture shown and letter missing in a word, select the correct choice for reinforcers and rewards

Math Apps

123 Animals Counting – Touch 40 different animals with sounds to see and hear numbers counted

Cute Math – Seven cute activities for counting, adding, and subtracting with manipulatives, solution choices, and verbal praise

KidCalc Math Fun – Activities for number recognition, counting, and math operations using flash cards, puzzles, and games

Music Apps

FingerPiano – Without any skill needed, lay the piano with your finger

TonePad – Create songs by simply touching the screen and seeing notes light up

Trope – Create soundscapes by tracing your finger on the screen, varying the tone with each movement

Vocal Zoo – Touch real animal photos to play animal sounds individually or in chorus

Song Apps

Five Little Monkeys – Musical counting game based on the popular rhyme with toys that react to touch

Itsy Bitsy Spider – Based on the popular song, every item is interactive, and the spider navigated you from screen to screen

Kids Songs Kwiz Game – As a popular kid song is plays, touch the corresponding picture from a field of 4

Toddler Juke Box – Listen to 5 classic songs (e.g. B-I-N-G-O) and one original song sung by a children's artist

Wheels on the Bus – Musical book with 8 interactive pages that plays the song in varied language or instruments, or records your voice

World of Lullabies – Audio and lyrics provided for 10 lullabies (e.g. This Old Man, Twinkle, Twinkle Little Star)

Art Apps

Curious George – With virtual stickers and 45 colors, paint 56 unique pages of Curious George and friends

Doddle Buddy – Finger paint with colors, and tap the screen to include stamps on pictures or provided backgrounds

Doodle Kids – Using a finger, draw random shapes in random colors and random sizes, then shake to clear the screen

iColoringBook – With many pen colors, paint included images, or use downloaded imaged form the internet

Itsy Bitsy Spider – A musical coloring image with 70 elements to paint, and the image has button for saving to your photos

Game Apps

Animal Match – Improve memory skills with matching animals in one of 4 difficulty levels (6, 12, 20, 30)

Bubble Wrap – Pop some bubbles and have some fun

Chutes and Ladders – Shake or touch to roll the dice in this multilevel board game to climb ladders and slide down the chute

Dora-Rainbow Ride – Along with a built-in coloring book, tilt your device to steer Dora on a rainbow slide, and count the crystals she collects

Lightsaber Unleashed – With sound effects and dueling music, swing your device around like a light saber

Littlest Pet Shop – With 3 pets to collect, keep your pet happy as you play, dress, and dance with it

Monkey Diving – Touch various colored monkeys to make them dive in the water, without hitting their heads on rocks

Shape Puzzle – move different shapes to fit into the puzzle

Let's Bead Friends – picking from multiple shapes and colors, make patterns multiple ways

Preschool Adventure – With 6 interactive activities, learn colors, shapes, body parts, numbers, animal matching and sounds

^{*}These suggested Apps were retrieved from <u>www.assistivetech.ning.com</u> by Eric Sailers.

Appendix H

Power Point Presentation

Slide 1



This part of the discussion will include reference to your handout which has detailed information on fine motor development. Your handout has detailed information on the typical skills you may see with certain years of a baby and preschooler's development. The following slides will address milestones of a child's visual-motor development. Keep in mind that these two skill areas are closely related when we look at eye-hand coordination and the function that results, such as reaching for objects, coloring, cutting, and self-help skills. Let's first review fine motor skill development, then move into visual-motor skill development.

Slide 2

Fine Motor Development

- Fine motor skills are the functions and use of our hands, fingers, and arms.
- Reaching, grasping, & manipulation of objects
- These functions and actions are necessary for a child to perform simple tasks such as coloring, cutting, and handwriting
- Fine motor skill development is often overlooked during infancy and toddlerhood.

Read slide.

Too often, large motor skills such as rolling over, sitting up, standing, and walking become the 'markers' of a child's development. While these are important, the child is advancing quickly in many other areas also. The areas of fine and visual-motor skills are vital to a child's functioning, and become important for his or her success once the child reaches preschool, kindergarten, and the elementary years.



An overview of hand grasp and function during the first year; read slide.

Slide 4



Read slide

Slide 5



This overview outlines how much development takes place during the important first year of life. More than likely you have seen these skills in your own child.

Visual-Motor Development

- An infants eyes do not naturally track (move together) during the first six to eight weeks of life.
- Infants will begin to focus on objects less than 12" away.
- Around four months of age, babies will begin to follow moving objects with the eyes and reach for objects.
- Eye-hand coordination and depth perception begin to develop. (Source: Infantsec.org)
- Let us look at what happens visually during the first year......

As the infant becomes better skilled in the use of his hands, his eyes are developing skills to assist in him in learning about his environment, and aiding the hands in doing what they need to do.

Read slide.

Slide 7



Read slide

Slide 8



Read slide, give examples. Ask participants if this is familiar from what they may have seen in their infant.

Examples: an infant at this age will look at the rattle you are holding, but when he or she attempts to reach for it, the arm and hand may not connect where the eyes are focusing.

By the fifth month, the infant displays better eye-hand skills, and he or she will 'connect' with an object more efficiently; in addition, the hand begins forming to grasp the shape of the object as it reaches for the object, i.e. a ball vs. a cylindrical shaped object.



Read slide. Note how quickly the visual system is developing and becoming more functional.

Slide 10



Ask participants if they have any questions or comments.

Slide 11



Read slide. Notice how the eyes and hands are working together



Read slide

Slide 13



Read slide. Ask participants if they have any questions at this point

Slide 14



Read slide.

Many skills are evident at this point in a child's development; it is important to be aware that skills are still developing throughout this year; the school curriculum at the kindergarten level tends to expect more writing than in previous years; it is important to find out what your child is expected to perform at school, and based from what you have learned so far, ask whether it is more than what may be developmentally appropriate.

Practicing letter and number writing at home, can help facilitate the skills needed for your child to succeed in

school.

Teachers: If you see a child is struggling with handwriting, or other eye/hand coordination tasks, request an observation from the school occupational therapist. The occupational therapist will be able to evaluate what skills the child needs to address and provide you with teaching strategies to help. Additional activities may also be suggested for the parents to practice at home to assist the child in gaining the skills needed to strengthen his fine and visual-motor performance.

Slide 15

Activities for Visual-Motor Development

- Play catch with various sizes of balls or bean bags
- Bounce/catch balls, toss/catch ball or bean bag
- . Throw a ball at a stationery, then moving target
- Play flashlight tag; use flashlight to draw or write on
- Provide various puzzles, ranging from simple to more difficult as the child gets older
- Have child trace shapes, letters and numbers with his finger; trace in finger paint or pudding

For the infant, refer to your handouts where fine and visual-motor activities are combined.

The following are suggested activities for the toddler and preschool age child.

Slide 16

Activities for Visual-Motor Development, cont'd.

- Provide markers, crayons, and paints for outlining pictures to be colored in
- · Have child complete half-drawn shapes
- Practice drawing a person, adding more body parts as the child advances in age
- When reading, guide his/her finger to follow the words
- · Have dotted or dashed letters, numbers, and the child's name for the child to trace
- Provide dot-to-dot and maze activities

Read slide. Add: Always keep in mind your child's interests, i.e. coloring books with a favorite Disney or cartoon character are more motivating for him or her. Also, choose activities at which he or she can be successful at, not ones that are too challenging. Remember that you are providing opportunity to practice emerging skills. Don't dampen your child's efforts with activities that are too difficult.

Activities for Visual-Motor Development, cont'd.

- Sort objects by various colors, shapes, sizes, or categories
- Provide chalk lines on the sidewalk for the child to steer his trike or push toy by staying 'on the road'
- Draw on the child's back letters, numbers, and shapes having him guess what you drew
- Play memory games
- Practice left/right hand and foot skills
- · Do search and find puzzles
- (Activity successions compiled by Patry Soldner, OTR/L, 2011

Read slide. Add: Remember to include siblings or friends in these activities to enhance motivation. Also, your child will learn by watching and doing.

Slide 18

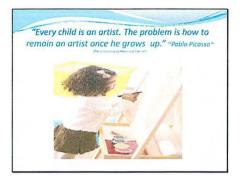


This item allows for the child to trace a shape, letter, ,etc. using the colored marker, then trace again using the other side of the marker, which is 'invisible', yet it caused the original color to change, e.g. red becomes yellow, green becomes purple. A great way to reinforce visual-motor skills.

Slide 19

Technology Ideas • www.KulsMemory.com : number scrambler, memory match, Light it up, Memory Face Off (sequencing task) • www.squidoo.com • www.parents.com • These have activities with both audio and visual components • See Appendix G in handout for iPod & iPad Apps

Suggested web sites for visual-motor/visual-memory games and educational activities.
Reference handout with list of various apps, all with components for fine and visual-motor skill building.
Be aware of providing a balance with technology learning and 'old fashioned' paper-pencil tasks, board games, outdoor play. All provided opportunities for developing well-rounded skills.



Remember: your child is growing and learning, sometimes at a different pace or in an area more evident than others; continue to nurture and allow him or her to be creative and gain confidence in his or her skills without judgment or comparison to others. Let him be the 'artist' he was intended to be!

Slide 21

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