

THE MONTESSORI METHODOLOGY AS APPLIED TO STUDENTS WITH
DISABILITIES

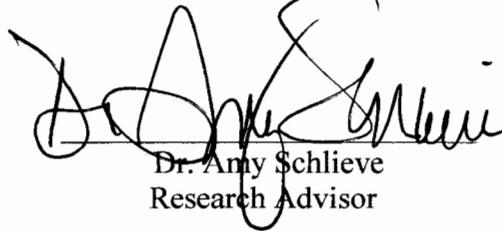
by

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A handwritten signature in black ink, appearing to read "Dr. Amy Schlieve", is written over a horizontal line. The signature is stylized and cursive.

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ABSTRACT

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At the turn of the century, Maria Montessori developed and popularized a radically different school curriculum that was student-centered and incorporated a multi-sensory approach to move students from concrete examples of basic principles to abstract concepts and generalizations. She believed that children possessed an innate desire to explore and learn. The role of an educator, as Montessori saw it, was to facilitate that inner drive through the judicious exposure to specific learning apparatus that allowed for self-discovery and self-actualization (Montessori, 1966).

The reliance on multi-sensory stimuli to teach concepts, sequentially organized curricula and the importance of transitional skill sets has often made the *Montessori Method* attractive for teaching students with disabilities (Fairbank, 1978). These precepts

have also been adopted in general education classes. Contemporary educators and researchers concur that much of what makes the *Montessori Method* effective for students with disabilities is equally applicable to the wider general school populace (Henley, Ramsey, & Algozzine, 2002).

The *Montessori Method* is reviewed in this paper using original writings from Maria Montessori supplemented with comments and critiques by both modern day critics and champions. This review explores the genesis of the *Montessori Method* including her influences, the application of her techniques with students, and the relevancy in today's classroom.

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The last person I want to publicly thank is my wife Beth. Without her unwavering support of me, I would never have been able to pursue my dream.

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CHAPTER 1: INTRODUCTION

The *Montessori Method* is a curriculum designed and first implemented in 1900 by Maria Montessori. The fundamental basis of this pedagogical approach is to create an environment for students to learn that is rich in multi-sensory stimuli allowing them to progress from concrete concepts to broader abstract reasoning. It is a child-centered environment in which the teacher becomes secondary in importance. Children learn through self-exploration in a prepared environment (Kramer, 1976).

This chapter will explore the context from which Maria Montessori developed the *Montessori Method* curriculum. Predecessors that contributed to her educational model will also be discussed.

The reliance on multi-sensory stimuli, sensori-motor training, and the notion of preparing students to function within society have made the Montessori methodology particularly attractive for teaching children with disabilities (Venuto, 1978). Chapter Two will address this propensity by looking at some of the theories of childhood development along with the unique needs of students with disabilities.

Maria Montessori was born in Chiaravalle, Italy in 1870. Her parents, Alessandro and Renilde, raised a young woman that would challenge contemporary views regarding the pedagogy of education and children. The model of education used primarily in schools throughout Europe and America in the early 18th century was based on a teacher-centered curriculum; Montessori advocated a child-centered environment (Pulliam, 1978). She would also be a pioneer in opening the doors of higher education and professional vocations long shut to women in early nineteenth century Italy (Kramer, 1976).

In 1875 the Montessori family moved to Rome and the influences that would shape Maria's life began to transform her. She was not recognized as an exceptionally gifted student in her elementary years although she did display compassion for others and an ability to formulate strong opinions at a very young age. Her mother Renilde, an unusually well educated woman for the times, must have seen the potential within her daughter as she always encouraged and supported Maria's vocational aspirations (Kramer, 1976). The cultural and societal transformation occurring in Italy following the unification and expulsion of Austrian rulers was the fortuitous backdrop to Maria's childhood. It was a period of national reform that fostered the belief that a new era was beginning and anything was possible (Kramer, 1976).

At the age of twenty-six, Maria Montessori became the first woman to receive a degree in medicine and surgery from the University of Rome. Her father Alessandro, a somewhat reluctant supporter because of her unconventional career choice, saw his daughter enter into a profession so new to women that she was treated as a curiosity, celebrity, and object of derision all at the same time (Kramer, 1976).

Maria confounded critics and thrilled supporters as she excelled in her duties as a practicing physician and research assistant at a psychiatric clinic. Her medical practice centered on women's health issues and their children. The genesis of this devotion to the well being of women and children, a largely forgotten segment in a male dominated culture, has been attributed to different moments or influences in her life (Kramer, 1976).

Some biographers cite a seemingly trivial interaction with a spellbound child and a piece of paper caught in the wind while others attribute the social and political upheavals occurring throughout Europe as the source of her commitment (Kramer, 1976).

Regardless, her ultimate specialty and efforts were brought into closer focus during her attending visits to asylums within Rome. Her rational explanation for the behavior of “feebleminded” children was the precursor of her educational reforms and didactic apparatuses (Gitter, 1966).

The staff of the asylum described the children as being disgusting in their behavior (Kramer, 1976). Montessori correctly deduced that their aberrant behavior was due less to diminished intellectual capabilities as it was to intellectual and sensory starvation (Gitter, 1966).

Her direct observations had led to this hypothesis and her interactions and tentative instruction with this populace verified the validity of her prognosis. She launched herself on a quest of self-directed exploration to further understand the mysteries of child education (Kramer, 1976). She consumed all contemporary writings on how to best teach the abandoned youth of Rome (Gitter, 1966).

Jean Itard was a young French physician and a contemporary of Montessori's. She followed closely the efforts of Itard as they mirrored her own intuitive instincts of teaching abstract thinking skills using concrete teaching materials (Gitter, 1966). What Itard attempted to do in the early years of the nineteenth-century was teach a “wild” boy how to function in society (Smith, Patton & Ittenbach, 1994).

A boy devoid of all meaningful communicative expression had been found in the woods outside the town of Aveyron, France. This boy was deemed uneducable by leading experts of the day and therefore institutionalized. Itard refused to believe the boy was beyond hope and instigated a series of sensory rich exercises to bring out the boy's hidden humanity (Smith, Patton & Ittenbach, 1994).

The exercises Itard designed were simplistic at first and progressed to levels of more difficulty. Matching and sorting basic geometric shapes evolved to recognizing and ordering letters of the alphabet to communicate simple wants. Unfortunately, the understanding of the boy seemed to peak at this accomplishment and his further education was entirely abandoned shortly thereafter. Although not a ringing success, Itard's methodology was not a dismal failure. He had shown that progress could be made with students with disabilities if the teaching methods were child-centered and sequential from concrete to abstract (Smith, Patton & Ittenbach, 1994).

Montessori continued to uncover and digest the works of other educational innovators in her search for a practical and successful pedagogy. One of the most influential contributors to Maria's self-education was Edouard Sequin. He had been one of Itard's students and had much more substantial success educating "idiot" children (Gitter, 1966).

Sequin constructed and refined a curriculum for children with disabilities that moved them through stages of exercises that developed their motor skills along with their cognitive abilities. He often stated that the curriculum of rote memorization and regimentation was counter-productive to the full intellectual development of children (Lillard, 1972).

Sequin's published techniques were the affirmation that Montessori needed to continue her pursuit of an effective and inclusive curriculum. She stated that after reading the words of Sequin, she started to see mental deficiency in children a result of improper educational processes and not a medical malady (Kramer, 1976).

Her continued study lead her to adopt and adapt many of the posits of yet another innovator named Friedrich Froebel. Considered the Father of Kindergarten, this German schoolmaster applied methodologies influenced by others such as Jean Jacques Rousseau, Jacob Rodriguez Paereira and Johann Pestalozzi. Froebel's kindergartens were a unique compilation of these aforementioned educators (Ornstein & Levine, 1993).

Froebel also used a multi-sensory approach in the design of the curriculum for young children. He was the first to articulate and put into practice the idea of exposing children to a prepared environment that related to their world in order to ready them for more abstract problem solving later in their education. He is said to have used the phrase "unfolding" when describing how children responded to his classroom environment (Lillard, 1996).

Unfortunately, by the time Montessori made the education of young children her vocation, the Froebel kindergarten had been institutionalized and the founding principles subverted (Kramer, 1976). Montessori was dismayed to see this happen and became determined to re-implement many of the original concepts in her own pedagogy (Kramer, 1976).

Maria Montessori's success in attracting converts to her belief that through reflective child-centered curriculum, children of all abilities could learn was due in part to her apparent personal power of persuasion. Capitalizing on her minor celebrity status following her graduation from medical school, she traveled extensively and spoke to enthusiastic crowds about what she had observed with children and how she thought educational instruction could be improved. She spoke eloquently and passionately before

anyone who was as interested in the reform of the educational system as she was (Wallin, 1968).

Her well-received addresses led to her appointment in 1899 to a teacher accreditation college lecturing on what was entitled hygiene and anthropology. The school she taught in was one of only two teacher preparation colleges in Italy. Because of this, her impact was pronounced among the new generation of Italian teachers. In the spring of 1900 she was made director of the Orthophrenic School that allowed her direct daily contact with school children (Orem & Coburn, 1978).

The appointment was also the first chance for Montessori to implement her adaptations and modifications of her predecessors including Itard, Sequin, Froebel and others. The school was designed exclusively for the education of a new generation of teachers. Perspective educators would be steeped in the use of multi-sensory teaching apparatuses to develop the necessary academic and social skills children with disabilities desperately needed (Kramer, 1976).

The end of the first semester of instruction under the guidance of Montessori ended as an unqualified success. Many of the previously marginalized children were able to meet or exceed the standards required of their formally educated peers. This early success fueled Montessori's belief in her methods (Kramer, 1976).

Montessori left the Orthophrenic School after two years. She had become pregnant out-of-wedlock and was forced by societal and familial pressure to give the boy up to be raised by foster parents. This boy, Mario, was reunited and acknowledged by his mother only after her semi-retirement from public life. This was only after he was a fully-grown man (Kramer, 1976).

In 1907 the Casa dei Bambini or “House of Children” was opened with Montessori as director. The schools were organized in a low rent slum district of Rome and meant to provide direction and education for the maladaptive and socioeconomically disadvantaged. Soon schools were being opened throughout Rome serving the needs of these children (Wallin, 1968).

Maria’s association with the House of Children allowed her to continually adapt and refine her methodology. Her powers of observation developed during her medical practice undoubtedly allowed this continued evolution.

The success that was occurring in these schools under the guidance of Montessori was not going unnoticed in other regions of the world. Montessori published a comprehensive volume entitled *The Montessori Method* in 1909 to feed those hungry for her effective teaching methods. This book was eventually translated into over twenty languages and schools implementing her methods started to sprout up around the world (Lillard, 1996).

Tarrytown, New York was the location of the first American Montessori School in 1912. Soon to follow were schools in Australia, Russia and Argentina This diversity of cultures that adopted her methodology is a reflection of its universal appeal (Lillard, 1996).

In 1910 Montessori gave up her medical practice and her collegiate career to focus exclusively on the promulgation of her methodology through personal lectures and training courses for new and/or experienced teachers (Kramer, 1976).

Currently there are over three thousand Montessori schools listed with the International Montessori Society based in Amsterdam, Holland. An additional two

thousand schools practice the concepts of Montessori, but are not officially recognized (Lillard, 1996).

Statement of Problem

The purpose of this study is to examine the pedagogical model of teaching implemented by Maria Montessori and the application of this curriculum for students with disabilities. Relevant literature will be reviewed to assess the validity of this instructional approach for students with disabilities in what are commonly referred to as Montessori schools.

Research Question

The answer sought in this prospectus is the acceptance or rejection of the Montessori methodology in teaching students with disabilities. Is there substantiated success in the pedagogical practice of teaching through the senses in a self-directed classroom for challenged learners? Is a methodology developed in the early twentieth century still relevant?

Definition of Terms

The language used within the educational community to describe the various modalities of any particular disability has and continues to evolve. Because of this, there are several terms that need to be defined that either reflect a historical vernacular no longer in use or are used today in an interchangeable manner that can cause confusion.

Mental Retardation – According to experts in the field (Smith, Patton, & Ittenbach, 1994) the classification of mental retardation is constantly under review and subject to debate. They cite the 1992 definition established by the American Association on Mental Retardation as the most often used and which reads:

Mental retardation refers to substantial limitations in present functioning. It is characterized by significantly subaverage intellectual functioning, existing concurrently with related limitations in two or more of the following applicable adaptive skill areas: communication, self-care, home living, social skills, community use, self-direction, health and safety, functional academics, leisure and work. Mental retardation manifests before age 18. (p.75)

Disabilities – In this exploration of the *Montessori Method*, the term disability is used to describe people with a learning disability more severe than what would classify as a learning disability today. Prior to the turn of the twentieth-century and compulsory school attendance laws, illiteracy was the norm and not the exception. People with mild cognitive disabilities and learning difficulties were not readily identified. This is in the era that the *Montessori method* was developed and therefore her pupils were further on the continuum of cognitive disability than a condition that would warrant special services today (Smith, Patton, & Ittenbach, 1994).

Curriculum – Within the context of this review, the word curriculum refers to the entire environment created in the educational setting. Montessori developed a methodology that prescribed to meet all the educational needs of the child regardless of the particular content area. Children receive instruction that is not delineated by specific subject headings (Pinho, 1967).

Prepared environment – This term is unique to the *Montessori Method*. Lay people often assumed that the Montessori classroom was devoid of structure. The prepared environment is the reality of a well-structured Montessori classroom.

Great care was devoted in the design of the classroom to facilitate instruction.

Maria Montessori was very specific regarding the physical characteristics of the classroom. A properly prepared environment included such things as child sized furnishings, minimal visual distracters, neutral colors and an open floor plan (Gitter, 1966a).

Didactic apparatus – This term refers to the heart of the *Montessori Method* of instruction. The apparatuses that Maria Montessori designed are very exacting in how they guide the child through self-directed exploration of concrete examples of abstract concepts. These apparatuses had to be durable, well maintained, self correcting and appropriate for the developmental age of the child. Many of them also served to condition the small motor skills necessary for later more refined tasks (Venuto, 1978).

Motor education – Maria Montessori believed that children learned best in an environment that was ordered and under the control of the students themselves. This need for order extended to control of their muscles and movement too. Exercises were designed that achieved control and order while also fostering self-sufficiency skills (Richardson, 1969).

CHAPTER II: LITERATURE REVIEW

Introduction

This chapter will expand on the individual contributions made by some of the progressive educators prior to Maria Montessori that impacted her pedagogy. Best practice methodologies as proposed by Montessori for the education of students with disabilities will also be delineated along with select contemporary models and methods.

Predecessor's Pedagogy

Jean Jacques Rousseau's publication of *Emile* in 1762 influenced the burgeoning transformation in the education of youth from a tyrannical model to a child-centered curriculum based on each individual student's needs (Sahakian & Sahakian, 1974).

His contention that top-down education was subverting the natural and innate moral and intellectual development of the student was met with widespread condemnation at the time of publication. However, commentators such as Lawrence Cremin point out that even Rousseau's harshest critics concede the importance his ideas have had in the Western democratic educational systems and the subsequent works of Pestalozzi, Froebel, Montessori, and others (Sahakian & Sahakian, 1974).

Rousseau believed in the education of a student that closely resembled that found in natural settings. He noted that animals and peasants allowed their offspring to explore and develop at a pace that was both unique and also relevant. The role of education as Rousseau saw it, should not be designed for a later vocation. Rousseau believed that all curriculum should be initiated by the child's own innate desire to learn and not arbitrarily

forced upon them. The education of a child should be first and foremost to create a resilient, confident, resourceful adult that will be an asset to the world (Ornstein & Levine, 1993).

An unobtrusive teacher, Rousseau maintained, should provide instruction in a sensory rich environment that the child be allowed to explore in. He also postulated that knowledge gained through the senses would lead to better understanding and thus transference would occur across content areas (Sahakian & Sahakian, 1974).

A more contemporary educator, Fairbank (1978), cites the goal of an adaptive lesson plan using sensorial experiences as prescribed in the first of the three-part Montessori methodology an effective way to teach students with disabilities. This method familiarizes and internalizes the concept of classification as students learn to discriminate among sounds, colors, sizes, textures, quantities and shapes. Also imbedded in these exercises is the goal to help the student become comfortable within their own environment while using their fine and gross motor skills, visual, auditory, tactile and kinesthetic senses.

Montessori's Methodology

Drawing in part from Rousseau's ideas, Montessori maintained that the senses needed to be trained in an orderly manner and that this is of particular importance when educating children with disabilities. The surprisingly simple and intuitive observation that a child of any ability will learn most easily the name of an object or experience only after experiencing it was the cornerstone behind sensorimotor exercises. This belief that information necessary for learning comes through all the senses is still seen as valid (Henley, Ramsey, & Algozzine, 2002). Congruent with the belief that curriculum must

be relevant, concepts are taught within the Montessori methodology without the reliance on abstract vocabulary until the child understands the context that these words are used (Gitter, 1966).

Because many experiences, if left to chance, would stimulate several senses at once Montessori prepared teaching apparatus that isolated each targeted sense. Visual discrimination materials range from cylinders of different sizes, dimensions, and geometrical form, to color tablets of various subtle changes. The auditory sense is stimulated through sound boxes and bells. Tactile sense experiences include feeling different fabrics, distinguishing between various common grains, and exploring differing textures of boards and tablets. The sense of smell and taste are also explored using hands-on representatives of each of these two with examples on both ends of the continuum provided to instill the notion of different. Stereognostic sense or muscular memory is taught to children with disabilities using geometric solids that allow the child to trace the object with their fingers and thus remember their sense of the shape within their muscles (Gitter, 1966).

Much of the sensory education curricula within a typically developing Montessori classroom require the use of a blindfold. Acknowledging and compensating for children with disabilities necessitates modification of these exercises to eliminate distractions or diversions. To make further necessary adjustment for these students, stimuli should be presented first in widely contrasting examples with only a few examples. As progress is made, the number of graduations should be increased and the distinction between stimuli slowly reduced (Richardson, 1969).

The sequential progression of each lesson plan is also an area where the influences of Edouard Sequin can be seen within the Montessori methodology. Both Sequin and Montessori believed in the three period lesson approach when educating students with disabilities (Richardson, 1969).

The first exposure the student has in this three-step process consists of associating sensory input with the name of the stimuli. The second period evaluates whether or not the child recognizes the introduced object. The third period lesson is often the most difficult with children with disabilities as it asks them to recall the name of the object or stimuli presented. If this is accomplished, repetition and review will establish not only the concept, but also the corresponding vocabulary (Richardson, 1969).

Today, universal design practices that strive to allow progress in general curriculum for all students incorporate augmentation and adaptation in much the same way (Turnbull, et al., 2004).

Augmentation is including within the educational plan of a student with disabilities any additional or supplemental skills necessary for academic success. Adaptation simply means removing any physical or environmental impediments to the success of the student (Turnbull, et al., 2004).

Since the Montessori methodology is individually paced and the child is allowed to revisit the learning apparatus until comfortable, children with disabilities are not discouraged or made to move on without fully understanding the intended concept. While children developing at an age appropriate rate may be able to quickly see the relationship represented in the teaching apparatus, learners with a disability benefit from being

challenged through personal persistence and self-paced repetition to master a concept (Datta, 1969).

Contemporary Pedagogies

Montessori found support and confirmation in the utility of repetition from Jean Piaget who is widely credited with developing new insight into understanding how children learn to think critically. Montessori and Piaget both saw mental maturation as an appendant of the physical growth occurring within a child. Because of the analogous relationship between mental growth and physical growth they saw, rote learning was not considered harmful for the intellectual growth of a child. As physical exercise developed muscle mass through repetition, they believed, so would mental exercise develop cognitive abilities (Elkind, 1969).

One of the competing ideas involving metacognition as it applies to students with disabilities is the information processing continuum purported by Donald Broadbent and his associates (Luftig, 1987).

In this model, learning and memory are intrinsically intertwined. Information is taken in through one or more of the five senses, passed through either iconic or echoic memory, attended to, moved to short term memory before being learned and ultimately stored in long term memory for recall and retrieval. Discontinuity at any point prior to the learning nexus is the defacto definition of a disability and the appropriate starting point for remediation by special educators (Luftig, 1987).

The parallels and overlap of strategies advocated in both models for addressing the needs of students with disabilities are obvious. Montessori and Piaget believed that cognitive abilities would be enhanced through repetition due to the link between physical

and mental growth while Broadbent saw repetition necessary to bridge deficits in the continuum.

The Montessori model of language development remediation is congruent with the sensorimotor training concept for overall cognitive growth. Using the aforementioned three period lesson model, the student with disabilities can be moved from illiteracy to literacy. The isolation of material to be learned is the preliminary step followed by the first lesson that presents letters cut from sandpaper. The child is allowed to touch and trace individual letters while also being instructed in the phonetic sound each letter makes. This multi-sensory approach allows the child to make a concrete association between the sound and the letter. The limitation of materials being taught also eliminates extraneous distractions and allows for the identification of deficiencies more quickly (Gitter, 1966).

Once an association between the phonetic sound a letter makes and its representative shape is mastered, the second period lesson determines if the student can distinguish between letters previously addressed. If the student fails to recognize letters without error, the teacher implements remediation with the stage one lesson. If the student displays proficiency, the teacher moves to the three period lesson that determines if the student can distinguish the letter and the corresponding phonetic sound when prompted without assistance. If they can, the lesson is complete and more letters or words can be introduced (Gitter, 1966).

This technique within the *Montessori Method* allows students with disabilities to understand relationships that would otherwise be too abstract. The written symbols of language can be a confusing concept if not addressed in this manner (Gitter, 1966).

Sequin noted the effectiveness of teaching with this technique for children with disabilities. He notes, “If we put a pippin or a crabapple before the child and let him know which is sour, he will not know it until he has bitten at both. That is knowledge” (Sequin, 1883, p.186).

Perception of the relationship between sounds and letter symbols is acknowledged today as a fundamental skill set during the learning to read process. Without the advanced ability to...”associate groups of letters with English language sounds, store numbers with quantities, store words with definitions...” even the most rudimentary reading skills will be elusive (Henley, Ramsey, & Algozzine, 2002 p. 154).

For students that lack the auditory and/or analytical abilities to master the phonics approach, further adaptations must be made. Some reviewers of contemporary best practice methodologies for teaching reading to students with this type of deficit have found success with functional living exercises incorporating written materials and student interest centered materials (Henley, Ramsey, & Algozzine, 2002).

The reliance on functional reading materials for instruction is the recognition and application of the current understanding of child development. Students without disabilities seem to move through the stage of learning where concrete or real life examples are needed much easier and more quickly than do students with disabilities (Henley, Ramsey, & Algozzine, 2002).

The methodology developed by Montessori for the acquisition of writing departs from the model Sequin developed. Sequin’s method of teaching children that were disabled was to teach them the mechanics of writing through intense emphasis in the

repetitive practice of tracing individual letters. Montessori designed exercises to prepare the child's hand for the act of writing first (Richardson, 1969).

This idea of training the hand first for the task of writing is a concept that Friedrich Froebel first developed in his early childhood classrooms. The inclusion of apparatuses that ostensibly were for play in Froebel's classroom were actually designed to increase the dexterity and utility of the child's fine motor skills (Woodham-Smith, 1953). The first apparatus that Montessori adapted to teach proper fine muscle control to a girl that was struggling with writing was a paper weaving exercise developed by Froebel. She eventually incorporated this exercise along with others into her curriculum as a precursor to all writing instruction (Richardson, 1969).

Montessori recognized the gap between the ability of children with disabilities to control their fine motor skills, which are essential for holding a writing instrument, and their emotional and mental readiness to learn to write. The second apparatus she advocated for the use of developing fine motor skills was the movable alphabet which bridged that gap. With letters cut from rigid stock and designated by color separating vowels and constants, children were able at their own pace to create words and sentences that they could see and touch (Gitter, 1966).

This approach has the ancillary effect of encouraging the emergence of increased self-esteem within the child that by definition fails often. The combination of muscular coordination training and the concrete examples of letters and words combine in the student with disabilities to form perseverance and success (Gitter, 1966).

In what order the student learns to either write or read first is dependent on the child (Montessori, 1966). The technique now realized as key to regular and special

education classroom instruction is tailoring the method to the individual (Ratekin, 1979). Learning to read is taught concurrently with writing after the child is able to recognize letters and their phonetic sound with each child's ability determining if they use pencil and paper to write words dictated to them or if they use the moveable alphabet letters. Since learning to recognize and construct simple sentences has been learned, the disabled child is next taught blending sounds and then sight words. As progression is made, the child is exposed to more advanced reading materials that are appropriately suited for their individual ability (Orem & Coburn, 1978).

Unless the ability to interpret information gathered through the senses is present within any child, the underlying cognitive deficit will hamper effective transference of both the written and/or spoken word. Remediation of these perceptual-motor processing skills was thought to be accomplished with worksheets stressing close observation and fine motor skill activities. The practice was not shown to benefit the student and eventually abandoned (Henley, Ramsey, & Algozzine, 2002).

What has shown promise is the realization that most stimuli is lost or not attended to by students with disabilities because of an inability to effectively use selective attention strategies. The need to process relevant stimulus input while simultaneously rejecting irrelevant information is seen by some as the crucial deficit in many students with disabilities (Luftig, 1987).

The implication for educators prescribing to this view is the challenge of teaching students with disabilities how to sift through what is important and what is not. The precise strategies, in the most concise terms, are the concerted efforts by the educator to focus attention of the student on only the relevant, eliminating all extraneous distractions.

How this focus is established is dependent on the student since interest, relevancy and individualization are all necessarily synonymous (Luftig, 1987).

The importance of mathematics is no less important in the lives of all students now than it was when the *Montessori Method* was developed. Montessori saw the innate ability of children to relate to the world in mathematical terms and built on the child's previous exposure to symbols and objects during reading and writing exercises to introduce number symbols. Once again the use of concrete examples of numbers and the quantities associated with those symbols are used to move toward understanding (Montessori, 1966). The didactic apparatuses are sequenced in such a way that students learn ordering, classification, size, shape, length, volume, place value and the four computation operations (Luftig, 1987).

The needs of the student with disabilities must be considered when designing the curriculum to teach functional arithmetic. The vocational, consumer, social, recreational and independent living needs are paramount in designing appropriate goals. Obtainable gradations of computational, problem solving and application competencies must be established to ensure challenging, but attainable success (Luftig, 1987).

The reform of mathematic curriculum and how it is taught in today's schools was initiated in part by the publications by the National Council of Teachers of Mathematics (NCTM) and the Mathematical Sciences Education Board (MSEB). The impetus for change has been the changing demographics of the schools including the inclusion of students with disabilities in regular classrooms. Understanding the variations within their classrooms has necessitated the need for teachers to reevaluate how effective the math curriculum is for all their students. The result of this reflection has been the moving away

from a pedagogy that stresses rote memorization toward methods that foster mathematical literacy. The emphasis on understanding concepts and relationships incorporates the use of manipulatives and concrete real life story problems and less on pencil and paper drills (Montague, 1998).

The need for conceptualization of abstract concepts is not diminished or negated for students with disabilities. This is however, the stumbling block many encounter comprehending arithmetic skills. Because of this, the instructional model often most beneficial for students with disabilities moves through concrete, pre-symbol and finally symbolic representations (Luftig, 1987).

Emphasis on the transition from institutionalized support of the school system to independent adulthood is one reason practical life exercises are introduced early in the Montessori curriculum (Gitter, 1966a). Another reason everyday activities are instrumental in the instruction of students with disabilities is the sensory input and motor control gained through such activities as classroom management, self-care, handling didactic objects and gymnastic exercises. Hands-on activities allow for motor education and personal success. Both are seen as beneficial for the overall growth of students (Montessori, 1965).

The current zeitgeist recognizes the need to plan for the transition into adulthood too. Ensuring that the skill sets needed were being addressed was the impetus for transitional services requirements being codified into law with the passage of legislation P.L. 94-142 in 1975. This sweeping legislation, which has been amended and expanded since its initial introduction, requires as one of its tenets that each student's life after they

graduate be considered in an individualized educational goals starting when the student is 14 years old. (Turnbull, et al.,2004).

CHAPTER III: SUMMARY, CRITICAL ANALYSIS AND RECOMMENDATIONS

This chapter will summarize the findings of this literature review. It will also provide a critical analysis of the information reviewed along with recommendations for further exploration and consideration of the *Montessori Method* for the education of students with disabilities.

Summary:

Maria Montessori developed a curriculum that was child centered, sequential in its organization and whole person in its breadth. Montessori intuitively saw the need to reform the education of children from the didactic method employed throughout Europe to a more responsive approach that took into account the child's innate abilities and disabilities. However, the insight required to develop such a program did not happen within a vacuum. After initial success educating a small number of children deemed deficient, she scoured contemporary pedagogical theories for further understanding and became convinced of the validity of her ideas and her evolving methods effectiveness across all socioeconomic and cognitive ability borders (Kramer, 1976). She borrowed and honed advances made by her predecessors who, in their own attempts to reform and expand the educational possibilities of all children, developed curricula that incorporated the senses and sequentially moved from concrete examples of concepts to more advanced abstract concepts delivered to the child in such a manner that the child advanced at their own pace (Richardson, 1969). The idea of manipulatives and incorporating multi-sensorial stimuli has seen a modern resurgence of interest in mainstream pedagogical

thinking and notable interest in the field of special education (Henley, Ramsey, & Algozzine, 2002).

Critical Analysis

The central contention incorporated within the Montessori curriculum is that children learn what they need to know when they need to know it. The role of the classroom, as Montessori saw it, was to provide the right material at the right time to the child. Believing that children would progress naturally from simple to more complex understanding and critical thinking, the classroom was designed to awaken the thirst for education that Montessori believed all children harbored (Montessori, 1966).

Edouard Sequin, who studied children with disabilities for his entire career and is often credited with being the first to effectively uncover the potential within children with disabilities through innovative teaching tools, was instrumental in Montessori's reformation. His methods centered on careful individualized study of the child and their own specific physiological and mental needs that lead them through a sequential journey of their senses awakening their cognitive abilities. This was revolutionary in its time and went far beyond the custodial needs being provided for up to that time (Montessori, 1966).

Sequin's contention that children learned through their senses and moved along a continuum of understanding was first proposed before the turn of the century. The current zeitgeist is congruent with that basic assumption. Under the current stipulations of IDEA and the *No Child Left Behind Act*, students of all abilities are mandated to progress toward standards set in conjunction with state and federal benchmarks. Many states are meeting the mandated requirement to include students with disabilities by offering

alternative assessment instruments, extended benchmarks and modified indicators. These accommodations reflect the pedagogical belief that students with disabilities learn at an individualized rate that progresses sequentially (Turnbull, et al.,2004).

The use of the senses has been recognized and integrated into the curriculum designed for students with disabilities since the 1950s. Beginning at this time, education of children with disabilities started to resemble what is currently being done. Prior to this time, academics were not a primary consideration in the education of students with disabilities. Starting in the 1950s, a variety of tactile kinesthetic approaches including the Grace Fernald's multi-sensory approach to reading were implemented in classrooms designated for students with disabilities. Fernald's approach was to have children trace letters and words to reinforce the neurological connection between phonetic sounds and meanings (Henley, Ramsey, & Algozzine, 2002).

Maria Montessori approached the education of children with disabilities with the eye of a scientist. Her personal disposition and formal medical education combined to create a perspective that favored a systematic and pragmatic approach to education. She showed very little concern with the "why" question and instead worried exclusively about the "how". According to Henley, Ramsey, and Algozzine (2002), competing and alternative approaches to teaching those with disabilities usually centered on finding the cause of the disability and teaching to compensate for that deficit. The medical approach was in vogue during 1940s and 1950s advocating controlling the environment to facilitate learning; in the 1960s the psychological process approach was used to enhance perceptual awareness; in the 1970s the behavior model was used with arranged learning environments, reinforcement of appropriate behavior and using structured instructional

techniques to teach academic skills. The move in the 1980s into the present has been not only toward establishing academic progress and success, but also transitional goals.

Recommendations

This reviewer concludes that Maria Montessori's approach to education, especially for those with a disability, fits neatly into the current understanding of child development and the contemporary belief in what is best for these students. Her curriculum incorporated many of the same principles seen today as empirically founded precepts of an enlightened 21st century.

Contemporary understanding of brain development now supports her "Sensitive Period" of child development. Working without advanced neurological development instrumentation, she was able to see that children are capable of learning at a pace that is specific to them and quite outside the influence of well-intentioned school personnel.

Maria Montessori's incorporation of manipulatives into the curriculum to teach abstract concepts has become common practice in progressive schools. Children are now taught to understand why the answer is what it is and not just the answer itself. The folly of rote memorization with paper and pencil worksheets was an unfortunately long held practice that produced citizens that struggle with new abstractions created in today's technologically accelerating society.

Another innovation of the Montessori curriculum was the focus on developing life skills that will enable students to be self-sufficient in society. This concept of transitioning from school to society has found particular applicability among special education students.

Although this reviewer agrees with many of the tenets of the Montessori curriculum, blind adherence to it is not advocated. Along with the contemporary acceptance for many of the principles put forth by Montessori comes the understanding that no one teaching style is appropriate for all children. The pitfall in accepting or rejecting any pedagogical approach is the myopic belief that all children will respond identically to any given curriculum.

Therefore, the *Montessori Method* along with any other pedagogy that reaches students should be considered without ideological constraints being imposed. Only when educators are free to cull the best and most appropriate pedagogies will they ever achieve the ideal of giving students what they need to become fully functional, contributing members of society.

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