DOCUMENT RESUME

ED 379 818 EC 303 691

AUTHOR Soto, Maria T.
TITLE Improving Cognitive Skills in Mentally Handicapped Pre-Schoolers through the Use of Computer-Based Instruction and Manipulatives.
PUB DATE Jul 94
NOTE 85p.; Master of Science Practicum Report, Nova University.
PUB TYPE Dissertations/Theses - Practicum Papers (043) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Cognitive Ability; *Computer Assisted Instruction; Concept Formation; *Concept Teaching; Early Intervention; Emotional Development; *Fundamental Concepts; *Manipulative Materials; *Mental Retardation; Preschool Education; Self Esteem; Social Development; Thinking Skills

ABSTRACT

This practicum project involved working with four preschool children with mental disabilities to increase their cognitive abilities through the use of computer-based instruction and use of manipulative materials. It also sought to improve the children's social-emotional development and self-esteem. The developmental levels of the four students were determined, and appropriate cognitive objectives were chosen. Concepts taught included shapes, colors, letters, and numbers. Appropriate computer programs were selected to introduce the concepts and provide relevant practice, and manipulative activities were developed to provide tactile stimulation. Children were also provided with opportunities to sort, match, identify, color, paint, paste, sing, and dance about the concepts. The practicum successfully met its objectives. Appendixes contain surveys and questionnaires documenting the baselines and results of the practicum. (Contains 17 references.) (JDD)

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ED 379 818

Improving Cognitive Skills in Mentally Handicapped Preschoolers through the Use of Computer-Based Instruction and Manipulatives

by

Maria T. Soto

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A Practicum Report

Submitted to the Faculty of the Abraham S. Fischler Center for the Advancement of Education of Nova University in partial fulfillment of the requirements for the degree of Master of Science.

The abstract of this report may be placed in a National Database System for Reference.

July/1994

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Abstract

An Exceptional Education Practicum to Increase Cognition Skills with Pre-School Mentally Handicapped Students through Computer-Based-Instruction and Manipulatives.
Soto, Maria T., 1994. Practicum Report, Nova University, Abraham S. Fischler Center for the Advancement of Education.
Descriptors: Mentally Handicapped Preschoolers/ Early Intervention/ Computer-Based-Instruction/ Manipulative Instruction/ Cognitive Skills/ Social-Emotional Skills/ Self-Esteem.

This program was developed and implemented to help mentally handicapped preschoolers increase their cognitive abilities through the use of computer-based and manipulative instruction. It was also designed to improve their social-emotional and self-esteem skills and attitudes. The objectives for this program were to increase the cognitive skills of at least three out of four mentally handicapped preschoolers by at least 50 percent; increase the cognitive development of at least three out of four targeted students by at least four months as evidenced by the Developmental Programming for Infants and Young Children (DPIYC); increase the social-emotional development of at least three of four targeted students by at least four months as evidenced by the DPIYC; increase by at least 33 percent the self-esteem of at least three out of the four targeted students; maintain the student attendance and participation at 85 percent or higher; and rate the computer-based-instruction and manipulative program at a 90 percent or higher as evidenced by the author-made survey. All of the program objectives were met with the target population improving their cognitive skills through the use of the computer-based-instruction and manipulative program implemented. Appendixes include surveys and questionnaires delineating the baselines and end results of the practicum based on cognition, social-emotional and self-esteem skills.

Authorship Statement

I hereby testify that this paper and the work it reports are entirely my own. When it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of other professionals in the field and in the hope that my own work, presented here, will earn similar respect.

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Practicum Title An exceptional education practicum to increase cognition skills with pre-school mentally handicapped students through computer-based-instruction and manipulatives.

Student's Name Maria T. Soto

Project Site Association of Retarded Citizens Date July 7, 1994

Observer's Name Xiomara Ayra Xiomara Ayra
please print *please sign*

Observer's position Teacher's Aide Phone # 598-8846

Observer's comment on impact of the project (handwritten):

I, Xiomara Ayra, have observed Maria Soto while the practicum was being completed. I was also an active participant of the Computer based and manipulative program.

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CHAPTER I

PURPOSE

The school setting was located in a privately owned building donated for the advancement of pre-school disabled children from birth through three years of age. It operated as a school for stimulation and experience building of physically and mentally disabled preschoolers. It admitted students of any sex, race, color, religion and ethnic origin which met the criteria required under the disabled categorization.

The students that were categorized as being disabled for admission to the program were to have met certain requirements. They were to show a developmental delay of at least six months in one or more than one developmental domain. The developmental domains focused upon were Fine Motor, Gross Motor, Language, Cognition, Self-Care and Social-Emotional. All of the students were diagnosed as having developmental delays manifested in mental and/or physical disabilities.

These developmental delays were determined through the use of the Developmental Programming for Infants and

Young Children (DPIYC) created by Rogers et al. in 1975. The DPIYC was the current measure used to determine these delays even though the copyrights of this document were expired in 1985. This measure was a part of the public domain record.

The 1992-1993 school profile indicated that the population of the school was composed of 55 percent Black-American, 23 percent Hispanic, 20 percent White Caucasian and 1 percent Indian non-American. The school had a population of 60 center-based students located in four different geographic zones throughout the city and 30 homebound students. The school had 21 faculty members and two directors.

All classes were limited to 12 students per class which promoted individualized attention, progress and evaluation. Each class also had one teacher and two teacher-aides which provided a ratio of one adult to every four students. Teachers were responsible for the creation and implementation of individualized education plans (IEPs) and an appropriate evaluation system based on the IEP and Developmental Programming for Infants and Young Children (DPIYC) objective (Appendix A, p.58). The teacher aides were responsible for assisting the teacher and providing individualized attention for students, when

necessary. The objectives were met through regular emphasis on Fine Motor, Gross Motor, Language, Cognition, Self-Care and Social-Emotional skills.

There were also 12 therapists that provided individual and structured programs for each student from one to one-half hours a week in speech, occupational and physical therapies. The objectives for therapy were also monitored by the IEP and DPIYC for each child.

Students attending the school came from families that ranged from low to lower-middle socio-economic backgrounds. All of the students came from families that were financially challenged. Six of the students in the class were from low socio-economic families and the other six were from lower-middle socio-economic levels. The developmental delays that were evident in the students found in the program were partially caused because of the li ted environments in which they were living. The lack of experiences limited the development of the children.

These low socio-economic levels challenged and deprived the students from experiencing the necessary stimulation with the appropriate equipment to reach their cognitive potentials. Due to these necessities the program was free to all of the families that were being serviced. The prerequisites for entry into the program

were evaluated based on developmental delays diagnosed through manifestations in physical and/or mental disabilities and the ages of the children were from birth through three years of age when placed. The program was funded 100 percent for each child serviced. The funds were provided through the combined efforts of a Health and Rehabilitative Service Board, a Public School System and an organizational fund raising committee.

While the school had locations in various settings, the practicum was being implemented in only one of the centers. This location was found in a middle class section of the city. It attracted students from various neighborhoods that were within a 20 mile radius, in each direction, from the center. These neighborhoods ranged in economic levels from low to upper-middle economic levels.

The author served as a full time teacher of 12 disabled children. The author had been at this position for six months. The author had three years of teaching experience in both private and public school settings, all in the primary elementary grades. Two of those years included teaching first grade. The writer held a bachelor of arts degree in Elementary Education and was fully certified through the State of Florida to teach

from grades one through six. The author completed a Professional Orientation Program and held a Professional Certificate from the State of Florida. The author completed all the required course work toward the completion of a master's degree in mental handicap and had passed the Florida Educational Mental Handicap Examination required by the state.

The author's responsibilities at this school included the creation, implementation and assessment of each of the 12 students in a class in the areas of Fine Motor, Gross Motor, Language, Cognition, Self-Care and Social-Emotional. The author's responsibilities also included the creation of IEPs for each student identifying the baselines, goals and objectives. The writer also held the duties of meeting on a monthly basis with the therapists and whenever necessary with the parents in order to discuss the students individualized needs.

The author worked in conjunction with the program director, parents, teacher-aides and students in implementing the Computer-Based-Instruction and Manipulative Program to improve the cognitive skills of mentally handicapped preschoolers.

The students in the center all shared one unique

characteristic: low developmental achievement. These low developmental achievements, not caused by the mental and/or physical problems, came from deficiencies in various areas. The main sources of these delays came from a lack of experience due to low socio-economic backgrounds, the lack of motivation from the parents and the lack of necessary equipment with which to practice concepts taught.

The four targeted students were all females with mild levels of Down's Syndrome. They ranged from 14 to 37 months of age at the beginning of the practicum implementation. None of the students had physical impairments. The demographics of the targeted students were as follows: one White Caucasian, one Indian non-American and two Hispanics. All of the targeted students ranged within the low socio-economic level as evidenced by the teacher-made questionnaire, found in Appendix B, given to the parents at the onset of the practicum. The students were all showing gaps from eight to eighteen months developmentally. These developmental delays were manifested in a combination of the following domains: Fine Motor, Gross Motor, Cognition, Language, Self-Care and Social-Emotional. These students were receiving speech, occupational and physical therapies which

enhanced their development. The parents of all the students understood that the experiment was taking place, although they were not aware of the actual students that were to be targeted.

The problem that was being targeted was that of low developmental achievement in Cognition and Social-Emotional domains and self-esteem. In order for the students to have been accepted into the program a delay of six months needed to be present. All of the targeted students showed greater levels of developmental delay than what was needed for admission into the program. These delays were extreme in nature and the progress shown was very insignificant. The development of the students should have been better than what it was because their mental deficiencies were very mild and they had no physical impairments. The students' developmental achievements should have been steady and consistent. The development of the students should have been growing at a steady rate and flowing continuously with the developmental objectives on the DPIYC, but yet it was not. The developmental growth was not continuous and seemed to be stagnant for months at a time. As evidenced by the DPIYC, the author noted that in the past these students seemed to show very minute growth in

development. Over a period of three to six months, these students showed an increase from one to two months each.

The author reviewed the IEPs and DPIYCs of each targeted students and noted the functional levels of each child. These documents showed developmental delays of over six months in a combination of domains. The cognition and social-emotional levels of the children were determined by a combination of the school records, parent information and teacher observation. The school records indicated that all of the students were functioning over six months below their expected levels. The parent information and teacher observations also reinforced the findings of the developmental delays. The teacher observations of the students' skills reflected that cognitively the students were not aware of many cognitive concepts. The students were lacking basic skills such as deducing the location and attaining hidden objects and showing the knowledge that the objects were hidden. Skills such as inverting a vial or box to get the contents and using a stick to reach an object out of reach were also not evident. These skills should have been mastered around the six to 12 month developmental level. Also skills such as matching different objects by item and color should have been mastered by 20 months and

they were not. All of these developmental objectives were found in the DPIYC. These delays were the result of a lack of experience in the actual performance of such tasks.

The developmental levels of each child in cognition and social-emotional domains were identified in Table 1.

Table 1

Developmental Baseline for students

Student	Actual age in months	Cognitive Development	Social-Emotional Development
A	37 months	24 - 27 months	24 - 27 months
B	34 months	16 - 19 months	16 - 19 months
C	37 months	20 - 23 months	24 - 27 months
D	14 months	6 - 8 months	6 - 8 months

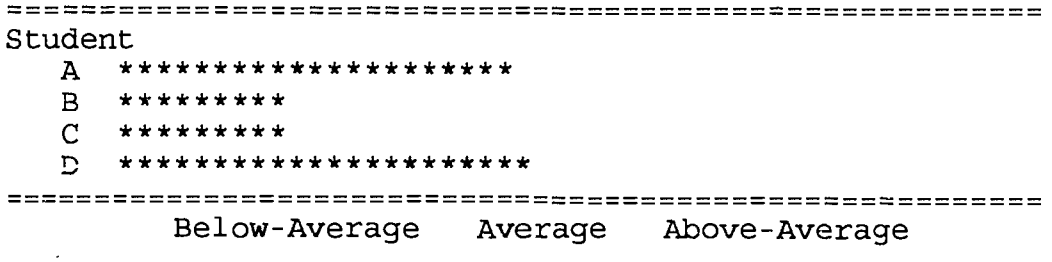
The results showed that Student A had a 13 month delay in both cognition and social-emotional domains, Student B showed an 18 month delay in both domains, Student C showed a 17 month delay in cognition and a 13 month delay in social-emotional skills and Student D showed an eight month delay in both cognition and social-emotional skills.

The author also determined a baseline for self esteem based on personal observations of the children and the parent information given on the questionnaire at the

onset of the practicum. The parents were asked to describe the targeted students self esteem, as they saw it. The results were shown in Table 2. The results showed that two of the students were within the below-average range and that two were within the average level.

Table 2

Self Esteem Baseline Graphed



There was one main cause for the developmental delays in each of the targeted students. This cause was the fact of limited experiences by these children. The limited experiences were manifested in a lack of actual "life experiences", lack of motivation from their environments and a lack of appropriate equipment with which to experience their surroundings. Each child needed functional experiences that would promote cognitive thinking and social interaction skills. Many critical bits of information were gathered from the parents. The results of the Current Early Intervention

Program Questionnaire are shown below in Table 3.

Table 3

Results of Current Early Intervention
Program Questionnaire

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Results were determined by 12 questionnaires filled in by parents of the 12 students within the practicum classroom setting.

Family Income..... low:$ 0 - $30,000....50%
..lower-middle:$30,001 - $40,000....50%

Number of children in household:.....1.....50%
.....2 - 3.....42%
...4 - more.....8%

Currently working parents:.....both.....33%
.....one.....67%

Number of children in program:.....one.....92%
more than one.....8%

Number of years in program:.....one.....75%
.....two.....25%

Current developmental level of child:
.....below age level.....100%

Information on children:
75% spent most of their time only with parents.
25% spent most of their time with people other than parents.
50% tried to accomplish new things on their own.
75% were friendly toward other people.
25% were shy.
50% were curious.
75% liked to be praised.
17% liked to praise themselves.

Information by the parents on the Program:
100% felt that the program was essential.
100% felt that hands-on experiences be provided.
50% felt that computer experiences be provided.
100% wanted new ways to help their children learn.

The targeted students had limited experiences in both domains, as evidenced by the parental responses on the teacher-made questionnaire and personal interviews which stated that 75 percent of the students spent most of the time with only their parents. The results also showed that only 50 percent tried to accomplish things for themselves. Fifty percent of the parents also admitted that they did almost everything for their children.

The experiences that the students encountered were limited by the parents and the environments of the children. The parents, in some instances, did everything for the children which promoted "learned helplessness." In other cases, the parents and the environments were not conducive to learning. The lack of education, motivation and materials did not allow the children to thrive cognitively and/or socially.

The observable limitations in experience, motivation and the appropriate materials resulted in the slow rates of development in the targeted preschoolers. These delays manifested themselves in the cognitive and social-emotional levels of development in each of these students. The developmental levels of the targeted mentally handicapped preschoolers should be developing at

steady and consistent rates when receiving the appropriate educational experiences, motivation and equipment in the cognitive and social-emotional domains. In this setting the mentally handicapped preschoolers are not showing the cognitive and social-emotional improvements that they should be.

The proposed objectives for the practicum were:

1. Over a 12 week implementation period, three out of the four mentally handicapped preschoolers will increase their developmental cognitive skills by at least 50 percent of the objectives as evidenced by the objectives on the teacher-made cognitive checklist on shape, color, number and letter concepts.

2. Over a 12 week implementation period, three out of four mentally handicapped preschoolers will increase their developmental cognitive skills by at least four months as evidenced by the Developmental Programming for Infants and Young Children: Early Intervention Objectives.

3. Over a 12 week implementation period, three out of the four targeted mentally handicapped preschoolers will show at least a four month increase in social-emotional growth as evidenced by a teacher observation based on the objectives mastered on the Developmental

Programming for Infants and Young Children.

4. Over a 12 week implementation period, 100 percent of the mentally handicapped preschoolers will be enrolled at least 85 percent of the time allotted for the practicum in a computer-based-instruction and manipulative program designed to increase cognitive and social-emotional skills as evidenced by teacher kept attendance records.

5. Over a 12 week implementation period, three out of the four targeted mentally handicapped preschoolers will show at least a 33 percent increase in self-esteem as evidenced by the parent response to a teacher-made self-esteem rating scale.

6. The computer-based-instruction and manipulative program will be evaluated following the 12 week implementation period, by conducting a survey of the staff and parents participating in the implementation of the practicum. In order for the program to indicate success the staff and parents need to rate the program as above average in at least 90 percent of the areas identified.

CHAPTER II

Research and Solution Strategy

"Most children experience a phenomenal amount of learning during the years from birth to school age" (Heward, 1992, p.574). Most children grow and develop in orderly ways. They first learn to crawl, then walk and finally run. As they begin to get an increased feeling of control over themselves and their environments, they become more independent. Normal rates and patterns of child development contrast sharply with the progress that most children with disabilities experience. The first years of life are very critical for disabled children.

Not too long ago, doctors and parents used to believe that if they waited long enough, the delays that their children were facing would miraculously go away. "Only recently have educators become convinced of the need for early identification and intervention" (Heward, 1992, p.574). Twenty years ago there were no programs offered to preschool children with disabilities. "Early childhood special education has now become one of the most prominent and fast-growing components of all of

education" (Oelwein et al. 1984, p.139). Almost every educator is now aware of the "importance of providing preschool disabled children with early intervention education" (Assael, 1985, p.126). This early form of education is very important for disabled children, as well as children that are at risk of becoming handicapped. As stated by Heward (1992), developing an effective system of early intervention services has become a national priority. One that can not be ignored.

"Many studies have been conducted that have proven the positive effects of early intervention on infants that are either labeled as mentally handicapped or at risk of becoming handicapped" (Bailey, 1984, p.136). As documented by Bailey (1989), Skeels and Dye in 1939 reported one of the earliest studies of handicapped infants that received early intervention programs. Their study reported that of the 12 students that received the early intervention, ten had reached productive levels in both social and cognitive domains. The only two students that had not achieved their potential were the two students that had remained in the institution and were not given the opportunity to experience regular life situations.

Another such study, as documented by Ramey et al.

in 1985, was completed by Kirk in 1958. This study measured the effects of two years of preschool training on the social and cognitive development of 43 mentally retarded infants. The study discovered that all of the infants that had received early intervention increased their Intelligence scores from 10 to 30 points and the control group, which received no intervention, decreased their Intelligence scores.

There are dozens of other studies that provided similar support for early intervention programs. In a meta-analysis of 74 studies investigating the efficacy of early intervention with handicapped infants, Castro and Mastropieri (1986) concluded that, "early intervention produces positive effects and that longer, more intensive programs are generally more effective" (Castro and Mastropieri, 1986, p.192).

"Most educators believe that early intervention and preschool services for both handicapped and at-risk children and their families can accomplish many benefits" (Bailey, 1988, p.217). Some of these benefits relate to the decrease of secondary handicapping conditions from occurring and the improvement of developmental delays in different educational domains.

As stated by Heward and Orlansky (1992) there are

many benefits that children receive from early intervention. Some of the following are listed below.

1. Help produce gains in physical development, language and speech development, social competence and self-help skills.
2. Help prevent the development of secondary handicapping conditions.
3. Reduce family stress and help parents and families support the development of a young child with disabilities.
4. Reduce the likelihood of social dependence and institutionalization.
5. Reduce the need for special education services or placement in special classrooms once the child reaches school age (Heward and Orlansky, 1992, p.577).

There is also some evidence that early intervention will eventually save the community and society costs of higher levels of educational and social services that will be needed later in life, if early intervention is not used. As documented by Heward (1992), Wood conducted a study in 1981 of the cost needed for special services provided to handicapped infants. This study showed that there was a savings of at least $10,000 when infants received early intervention instead of intervention received later on in life.

As an extension to the necessary concepts of early intervention for mentally handicapped infants is the creation and implementation of a computer-based and manipulative program. This program is one such aspect that promotes skill development in many of the

educational domains that are focused upon through an early intervention program.

As little as a decade ago, computers were seldom in any schools or classrooms. Now, however, technological advances, increased sales, decreased costs, improved software and interest from parents and teachers make it possible to improve teaching and learning. "The computer has become one of the most powerful tools in schools today. Effectively utilized it can change the way kids learn" (Olson and Platt, 1992, p.328).

Research by Roblyer, Castine and King in 1988, as documented by Schmidt et al. (1985), indicated that microcomputers with the appropriate software and adaptations, where needed, have the potential to raise the quality of instruction. Instruction is made much more innovative and interesting with the many different computer programs available to help children learn. The use of computers is also very diversified. Children can learn new concepts, practice or review concepts already known and play games and create their own projects. "In short, computers can enhance most classroom instruction and management" (Olson and Platt, 1992, p.328).

Another key issue to be aware of is that in our society today every child is being raised in an age of

technology. Computers are the way of the present and the future and something that everyone deals with. The availability of computers in the classroom provides experiences that will prepare the students for real world tasks. "The computers make it easier for mentally handicapped students to relate to the real world and also help them realize the technological advances that are being used" (Hutinger, 1985, p.317). It helps them learn as much as they can about the world they live in.

Computers also provide special features for the teachers that allow their students to work and learn. It provides individualization and self-pacing for the students. It allows the children their own time to learn and practice the skill. It also provides the student with immediate feedback such as a prompt or a noise that immediately tells the student if they are correct or incorrect. It provides things such as repetition and well-sequenced instruction. Both of these features allow the students the flexibility of using the time that each individual would need in order to maximize their learning experiences. Each of these facilities help the teacher better individualize each child's instruction.

Manipulative use is also another very efficient tool that teachers use with mentally handicapped and non-

handicapped students. Manipulatives offer students the experiences to manipulate actual objects in order to conceptualize the idea that is being taught to them. Manipulatives require physical contact with certain objects in order to achieve certain tasks. Mentally handicapped infants need these experiences continually. Since these children have trouble understanding abstract concepts right away, the use of manipulatives provides them with the opportunities to move items around and regroup them again in certain patterns that would facilitate learning and understanding.

Manipulatives make a concept concrete to an individual. They provide the necessary practice and visible constructions that explain and demonstrate an idea. These manipulative items are also things that are found in the childrens' natural surroundings. This being the case, the manipulatives facilitate the learning process by being a part of the child's environment in which they can learn concepts as a whole. The items are familiar to the students and through this familiarity the students will learn faster.

"Materials are the nuts and bolts of an instructional program, the vehicle through which instruction is delivered" (Olson and Platt, 1992, p.122).

If students are expected to achieve desired results, teachers must use the appropriate manipulatives and devices that will motivate, excite, challenge and instruct their students. The correct manipulatives are great ways in which to reach the desired objectives with each student.

This practicum was not selected to determine that the target students were correctly categorized as mentally handicapped or to evaluate that the students were developmentally delayed. The practicum was designed to increase cognition in mentally handicapped preschoolers from the original baseline determined at the beginning of the practicum to a higher cognitive level through the use of computer-based and manipulative instructional approaches.

Organizations such as the Handicapped Children's Early Education Program (HCEEP) determined that "many means exist for espousing the virtues and benefits of any treatment, including early intervention with handicapped children through various different means" (Wolery and Dyk, 1984, p.66). These means were very diversified in nature and were structured through many different devices and technologies.

While most of the current research on computer and

manipulative instruction were focused on school aged children, the purpose of this practicum was to adapt computer and manipulative use to infants within the age range of one to three years. This practicum was geared towards increasing the experiences that infants received in their early intervention program in order to eventually increase their cognitive skills. Manipulatives and computer-assisted-instruction were two strategies that would increase cognitive development in mentally handicapped infants.

The author of the practicum selected a computer-based-instruction and manipulative program as a solution to the low cognitive abilities of the targeted mentally handicapped preschoolers due to the ideology that experiences are necessary for cognitive development. Kulik, as quoted by Schmidt et al. (1985), suggested that "at lower levels of instruction, learners need the stimulation and guidance provided by a highly reactive instructional medium" (Schmidt et al. 1985, p.493). The limited experiences that the targeted students have received in their homes need to be supplemented by more motivating and exciting strategies such as computers and manipulatives. The author also chose computers to promote the critical thinking skills of each of the

targeted students by providing simulated practices in which the students could perform the tasks of the objectives involving different cognitive concepts. The choice of the manipulative program was also decided upon because of the lack of actual hands-on experiences. These manipulative experiences provided the chance for the targeted students to manipulate their surrounding environments and have functional and practical applications of the concepts learned.

Much research was done on the benefits of computers on handicapped children's progress. Some of those studies emphasized the benefits of computers on very young disabled infants. One such experiment was performed on disabled children as young as 12 months of age. This study, as quoted by Robinson (1985), was performed by Brinker and Lewis in 1982. This study attempted to observe if disabled infants this young could learn to produce the desired results, such as music or a mother's voice, from moving the appropriate limbs. Another computer study was conducted on disabled three year olds. This study, used as a source of documentation by Watson et al.(1985), was performed by Shade and Watson in 1986, "successfully taught three-year-olds to manipulate a fairly complicated sequence of single-key

steps designed to sort inside/outside-the-house microworld" (Watson et al. 1985, p.202). Both of these experiments were successful in teaching very young disabled children how to operate computer programs within their realms of abilities.

Based on these specific experiments, the author chose to implement a computer-based instruction model into the classroom setting chosen for the practicum. These experiments provided a positive attitude towards the ability to teach disabled toddlers cognitive skills through the use of a computer-based instructional approach. Along with the computer-based approach, the author also chose to implement a manipulative program that would also enhance and follow-up the concepts being taught. The manipulatives used would allow the students concrete practices with items that they were familiar with, thus increasing the amount of stimulation being presented to them and facilitating their learning and understanding.

Certain concepts of quality evolved and were essential in the creation of an appropriate computer and manipulative program. The programs that offered the most quality instruction and practice were the ones that were most successful. Adaptations and flexibility were two

key features that also provided to a quality program. The devices needed to work the computer for mentally handicapped infants ranged from various switches to voice boxes and touch screens. These devices allowed the students the ability to run the programs on the computer through minimal assistance. A list of specific devices were included in Appendix C.

This practicum also dealt with the improvement of social and emotional skills. The practicum was established to create a more positive and secure learning environment that would in turn create a more positive self esteem within each child. Self esteem was a key factor to the success of the program. The increasing of the student's self esteem would create a more positive participation and willingness to try by the students. This attempt to try would mean that the students would at least attempt the cognitive and social-emotional objectives not yet mastered. Success in both of these domains would then become possible.

CHAPTER III

Method

This researcher was allotted a great many privileges through the expertise of the practicum mentor and the necessary devices and techniques available to actually implement the program. Along with the essential hardware and software, the flexibility allowed to the researcher in time and schedule adjustments facilitated matters and made the experiences exciting ones.

Before the actual implementation of the program could begin, there were necessary steps which needed to be taken. First, a baseline needed to be drawn up based on the targeted students' developmental levels emphasizing Fine Motor, Gross Motor, Cognition, Language, Self-Care and Social-Emotional skills. The targeted developmental domains for the practicum were Cognition and Social-Emotional levels. Each child was given a very basic evaluation, judged on the expertise of the teacher, that diagnosed and identified the actual levels of development that each child was on based on the objectives outlined in the Developmental Programming For

Infants and Young Children: Early Intervention Objectives (DPIYC) in Appendix A. These levels were determined in order to show the beginning developmental levels of each student and compare the final levels.

The author created a teacher-made questionnaire that was given to the parents of the targeted students. This questionnaire, in Appendix B, asked questions that verified a need for the students to increase cognitive skills. The parents identified certain relevant information about themselves, their families and their children.

Following the determination of the students' developmental levels, based on parental information and teacher observation, appropriate cognitive objectives were chosen as goals to improve in each child. These skills were divided and adapted for each individual child and appropriate computer programs were chosen to introduce and provide relevant practice for the targeted students. Adequate manipulative activities were also chosen to follow-up and provide additional tactile stimulation in order to increase the students' cognitive abilities in the chosen objectives. These objectives and activities were detailed in Appendix D.

The author began implementing the program by

introducing the concept of shapes. The author included the theme of shapes for the entire class for the first two weeks of the practicum. The author demonstrated and explained what a circle, square and triangle were, including specific tactile examples of each that the children could touch and manipulate. These tactile objects such as balls, boxes and triangle bells, along with other items such as felt cut outs of such shapes were used consistently throughout the first two weeks to provide manipulative practice in matching, coloring, painting, sorting, tracing and game playing. These manipulative activities, along with songs and dances of shapes aided the students in their understanding and the ability of manipulating objects with different shapes.

During these two weeks the author, along with two aides would alternate the task of instructing the students to use the computer programs available for shape recognition. The programs used for this practicum were all part of the public domain in a local technological resource library that specialized in providing programs for child development. The computer used was an IBM compatible computer with a hard drive and two alternate disk drives. The author introduced a program entitled Kevin's Shapes and Letters. This program had an

unknown maker and was very basic in nature. The author introduced the shapes by demonstrating them on the screen to all of the targeted students. The author had to use a key guard so that only the function keys that showed shapes when hit would be accessible to the students. The keys were labeled with the shapes that each key would produce. At the beginning of each lesson with each targeted student, the teacher or the teacher aides would make sure that the program was operational and review the shapes and say the names while also showing a manipulative of the same shape to each child.

Each targeted student was allotted 15 minutes to work with the shape program on the computer each day for two weeks. The teacher or teacher aide monitored the child on the computer and provided assistance whenever necessary. The other adult, whether the teacher or the teacher aide, provided manipulatives for the other targeted children to work on for at least 15 minutes a day for two weeks. These children used teacher-made felt books on the shapes, construction paper cut outs of shapes and many other familiar items that facilitated their understanding of the concept of shapes. These activities were also monitored on a daily basis to ensure productive learning and to help those students who needed

more assistance.

At the end of the two weeks, the author tested each student to evaluate the objectives mastered on the concept of shapes. The evaluation was in a very basic format- verbal where possible and through gestures and/or tactile responses where necessary. The test was a teacher-made list of objectives for shapes that was placed in Appendix E. The author placed the results of this test in Chapter Four which reflected the appropriate results for each targeted student.

The author then introduced the concept of colors to the entire class. The colors that were focused upon were red, blue, yellow and green. The author again showed an example of each color and found items in the class that had the same colors on it. As the author introduced the colors, the students performed various activities such as coloring, painting, pasting, throwing, sorting, matching, identifying, dancing and singing about colors. These activities were included in the daily independent activities for each child in the class. Besides all of the individual activities that were done as a class about colors, the students were again provided the opportunities to manipulate many items by color. They were given teacher-made felt books to match color, items

to be sorted by color, games about colors, songs about colors and many other activities.

While the students were involved in their manipulative activities, the teacher and/or teacher aide took the targeted students, one at a time, and introduced the program on colors. The program used for colors was again Kevin's Shapes and Letters. This program, although it was not specifically designed for colors, had very vibrant colors that helped the students discriminate one from the other. The teacher used the same function keys for the shapes to teach the colors. The focus of the program during the third and fourth weeks were to show the colors. The teacher showed the students how each time they hit the same shape keys over and over again, the colors changed. With this program the children were given the opportunity to change the colors on the screen by simply pressing a key on the computer or through the use of a large red switch. At the onset of each session on the computer the adult again introduced the colors and provided familiar objects with the same color for the students to associate to each color. The adult also verbalized the names of the colors as often as possible in order to increase language in the preschoolers.

The same 15 minutes were allotted each student on

the computer and with the manipulatives. The author made sure that the computer was operational before the sessions began. The sessions were again closely monitored to provide the best experiences for the children during both the manipulative and computer sessions. The author also made it a point to praise the students verbally and through gestures as much as possible in order to promote a higher self esteem.

Upon completion of the instruction on colors, the author again evaluated each child on their ability to complete the desired objectives on colors which were stated in Appendix F. The author again used a very easy and non-threatening way of testing in order to promote successful feelings and actual assessment from each child. These results were shown in Chapter Four.

The fifth and sixth weeks of the practicum were spent introducing and teaching the concept of letters. This concept, although it seemed hard at the onset of the practicum, turned out to be manageable for the students. The author introduced the letters A, B and C in order to limit the frustration and confusion of the children. The author showed the letters, one at a time, and said the name of each letter and the sound that it made. The author provided opportunities for the children to say the

sounds and names of the letters. The author also showed objects that began with the same sounds as those that were introduced. The letters took a longer time to introduce because only one could be introduced at a time until the author felt that the children understood it enough to go on to the next letter.

The children were again provided with many activities which allowed them the opportunities to sort, match, identify, color, paint, paste, sing and dance about letters. The manipulatives provided were all letters made of various materials such as sponges, construction paper, wood, felt and clay. These letters were also in bright colors which attracted the attention of the children. On this concept much language was used and many group activities were done to motivate the students about the letters.

The targeted students were again introduced to the letters through the computer programs chosen. One of the programs selected was called Brandon's Lunchbox. This program was created by Joey Robichaux and was also a part of the public domain records. This program provided games such as matching upper and lower case letters. The author again used the key guard to only allow the students the ability to hit the keys with the letters on

them. The teacher instructed and demonstrated to each child how the program worked. There was a second program that was used for this concept which was called Alphabet. This program was created by an unknown source and was also a part of the public domain. Both of these programs provided immediate feedback to the students and had nice songs and sounds that accompanied each response.

The author followed the same procedures as before in maintenance of the sessions while the students were on the computer and with the manipulatives. Much language was used during the computer sessions and positive feedback was constant. At times the students worked in groups of two on the computer in order to facilitate cooperative learning between the students. Manipulatives were also present during the computer sessions for comparisons of the letters. Each child had the same 15 minutes for the computer sessions and another 15 minutes for the manipulative sessions.

The author followed the same evaluation techniques at the completion of the sixth week of implementation. The objectives were checked off on the author-made checklist of letter objectives found in Appendix G. The results were shown in Chapter Four.

On the seventh and eight weeks of the practicum, the

concept of numbers was taught. The numbers that were focused upon were one, two and three. The author introduced the numbers in the same fashion as the introduction the letters. The author used personal discretion in introducing one number at a time until the students felt comfortable with them. The author showed the association of objects to each number with common objects for the children. The students participated in activities such as coloring, painting, sorting, matching, identifying, pasting, and manipulating the correct amount of objects in games and while dancing and singing. The concept of numbers was also carried over into snack and lunch time. Each student took turns counting the number of food items that they had before them and told the teacher, verbally or through gestures, how many they had and/or wanted.

The computer sessions were again 15 minutes in duration for each child and the programs used were Brandon's Lunchbox created by Joey Robichaux and Animal Math created by an unknown author. Both programs were safeguarded by the key guard which enabled the students to only operate the numbers on the keyboard. Brandon's Lunchbox provided counting games and object association. The concept of the game was the hardest one that the

students were exposed to. The author provided constant monitoring during these sessions in order to avoid frustration. The teacher and/or the teacher aide also provided assistance in counting the objects. On the wall of the classroom the author placed three very large numbers with the correct correspondence of objects and the students would participate in correspondence games during circle time to provide constant reinforcement of the numbers. These numbers were also used during the computer sessions. The adult used these numbers to assist the students in counting the number of objects.

The author then assessed each child based on the objective checklist for the concept of numbers found in Appendix H. The author used the same easy evaluation method and showed the results in Chapter Four.

The next three weeks of the practicum were spent reviewing the concepts of shapes, colors, letters and numbers. The students were allowed to choose the manipulatives and concepts they wanted. The targeted students were also allowed to choose which program they wanted to use each day. The students were again allotted 15 minutes a day to work on manipulatives and another 15 minutes to work on the computer.

The last week of the practicum was used to assess

each targeted student a second time on each of the objectives on the checklists for each cognitive concept taught. The reason for the second testing was to evaluate the amount of information that was retained due to the manipulative and computer-based-instruction program. The last week was also used to interview the parents and have them each fill out the survey on the program (Appendix J, p.79) and the self esteem rating scale (Appendix I, p.77) on their children. The results of the self esteem rating scale were shown in Chapter Four. The results of the final survey of the practicum were also reported in Chapter Four. The students cognitive and social-emotional levels were also determined by the author based on the objectives of the DPIYC in each of those domains. These results, along with the attendance records of each targeted student were also shown in Chapter Four.

CHAPTER IV

Results

Cognition, socialization and self-esteem are very important aspects of any child's development. This practicum was designed to demonstrate the achievement in cognition, socialization and self esteem. The author evaluated the success or failure on six objectives that were stated in Chapter I. These objectives were divided into terminal performance, affective/attitudinal and process/product objectives.

The first terminal objective that this practicum set out to achieve was determining whether at least three out of four mentally handicapped preschoolers would increase their cognitive skills by at least 50 percent based on the objectives on the teacher-made checklist in Appendixes E-H. The results of this part of the practicum proved to be a success. At least three of the four targeted students showed a mastery of at least 50 percent on the objectives chosen by the practicum author in the areas of shapes, colors, letters and numbers. The results were shown in Table 4.

Table 4

Results of Cognitive Development

Shapes

Student									
A	**********								
	##########								
B	********								
	########								
C	********								
	########								
D	********								
	########								
Total	0	1	2	3	4	5	6	7	8

Objectives

* objectives mastered in the first set of results.

\# objectives mastered in the second set of results.

Colors

Student										
A	**********									
	##########									
B	********									
	########									
C	********									
	########									
D	********									
	########									
Total	0	1	2	3	4	5	6	7	8	9

Objectives

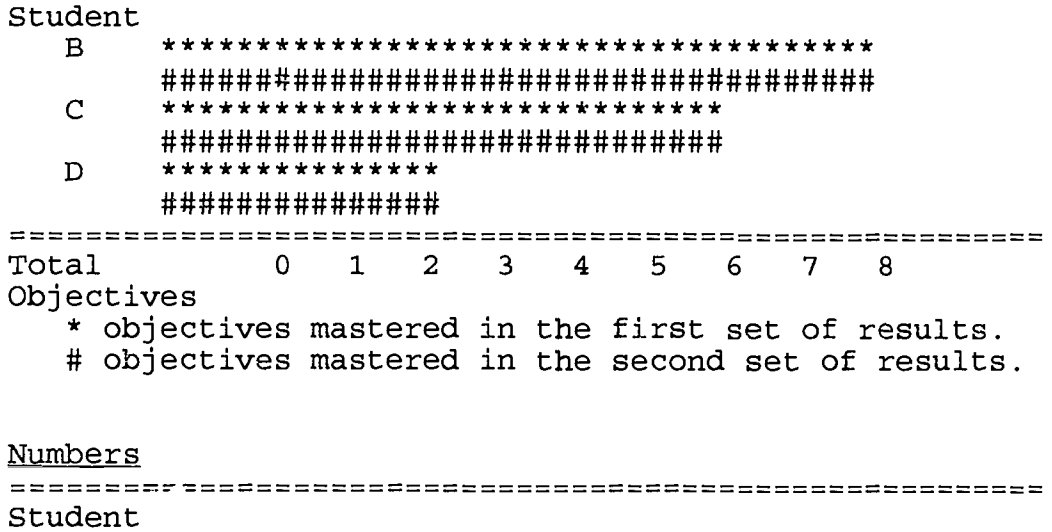
* objectives mastered in the first set of results.

\# objectives mastered in the second set of results.

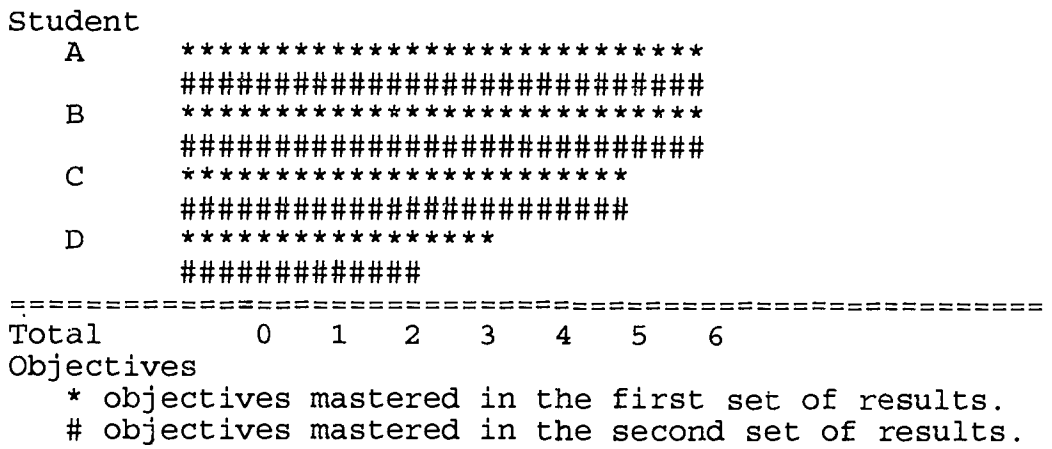
Letters

Student										
A	**********									
	##########									

Table 4 (continued)



Numbers



Out of the eight objectives on the concept of shapes three out of the four targeted students mastered and retained five of the objectives. On the concept of colors there were nine objectives. Again three out of the four targeted students mastered and retained at least

half of the objectives. On the concept of letters there were eight objectives. Three out of the four targeted students mastered and retained six objectives. On the concept of numbers three out of the four students mastered and retained at least half of the six objectives. All of these results proved to be satisfactory in showing that at least three of the four targeted students mastered the cognitive objectives by at least 50 percent.

All four of the students mastered the second objective of the practicum which was to improve their cognitive abilities by at least four months, as evidenced by the DPIYC objectives and teacher observation. All of the students increased their cognitive scores by at least four months developmentally. These results were shown in Table 5.

Table 5

Cognitive Levels of Increase in Months

Student	Actual age in months at the end of practicum	Baseline levels	levels at end of practicum
A	40 months	24 - 27 months	32 - 35 months
B	37 months	16 - 19 months	24 - 27 months
C	40 months	20 - 23 months	24 - 27 months
D	17 months	6 - 8 months	12 - 15 months

Students A and B increased their cognition by eight months, student C increased the cognitive score by four months and student D increased the cognitive score by six months. All of the students became more actively involved in the computer and manipulative instruction and practices which had a positive impact on their cognitive achievements.

In terms of the social-emotional growth terminal objective that stated that at least three of the four targeted students had to exhibit a growth of at least four months socially based on the teacher observation of the objectives found in the DPIYC. As shown in Table 6, all four of the targeted students showed an increase of at least four months socially.

Table 6

Social/Emotional Levels of Increase in Months

Student	Actual age in months at the end of the practicum	Baseline Levels	Levels at end of the practicum
A	40 months	24 - 27 months	32 - 35 months
B	37 months	16 - 19 months	24 - 27 months
C	40 months	24 - 27 months	28 - 31 months
D	17 months	6 - 8 months	12 - 15 months

Students A and B showed an eight month improvement each, student C showed a four month improvement and student D showed a six month improvement. Objective three showed a positive and successful result.

The students' attendance was also within the desired 85 percent participation range. All of the students attended school and participated in the program regularly during the implementation of the practicum. One of the students had a 100 percent participation and the other three ranged between 85 and 95 percent. These results are shown on Table 7.

Table 7

Attendance Record for Practicum

Student	Number of Days Absent
A	******
B	**********
C	**********
D	**********
	0 1 2 3 4 5 6 7 8

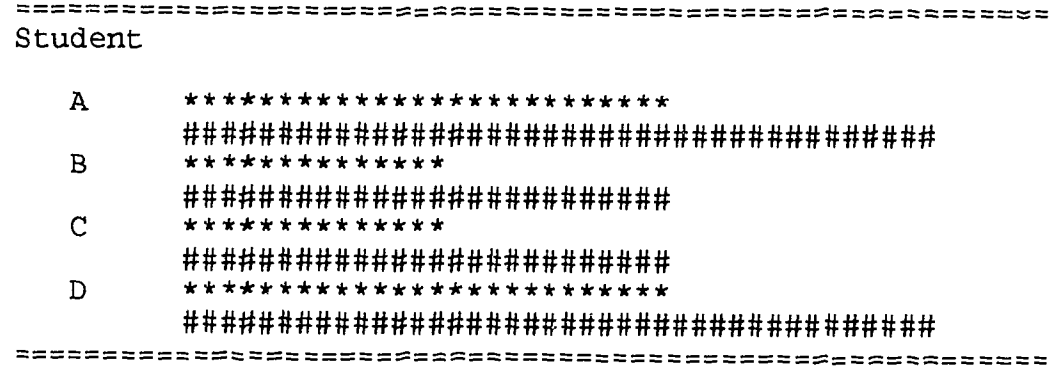
=Students could not be absent more than eight days to participate at least 85 percent of the time in the practicum.

Based on the teacher-made self esteem rating scale, the parents indicated that all four students showed at

least a 33 percent increase in their self esteem. The staff and parents commented, in personal interviews, that all four students showed a significant amount of improvement in their self esteem. Two of the students increased from a below-average rating to an average rating and the other two increased from an average to an above-average ranking. These students began to demonstrate behaviors of pride and praise towards themselves when they achieved the correct answers, even without adult prompts and cues. These results are shown in Table 8.

Table 8

Results in Self-Esteem Rating Scale



The computer-based and manipulative programs were

evaluated by the parents and staff of the center where the practicum was implemented. The results of the practicum were shown in Table 9.

Table 9

Results of Final Survey of the Practicum

The final results of the practicum, as evidenced by the final survey that was filled out by the staff and the parents of the students in the program, were distributed by the following percentages.

The parents and staff felt that each of the areas mentioned below were effectively the percentages stated.

The computer-based-instruction.....90%
The manipulative program.....95%
The cognitive improvement of the child.....90%
The cognitive awareness of the child towards:
shapes.....95%
colors.....95%
letters.....90%
numbers.....92%
Improvement of the self esteem of the child.....95%
The feeling of the overall program.....92%

All of the parents and staff that filled out the survey felt that the program was beneficial enough to continue.

The staff ranked the program from 90 to 95 percent in different areas. The parents ranked the program exactly at 90 percent. Both the parents and staff felt that the program implemented was very effective and reliable in aiding disabled preschoolers to learn and achieve higher results in cognition, social-emotional and self esteem

skills. They also stated that the program offered a much more focused curriculum which motivated the students to concentrate and physically manipulate their environment in a more productive fashion.

The author received valuable information from the parents and staff members of the center in which the practicum was implemented. Through personal interviews and the assessment of the surveys filled in by the adults, the author realized the positive impact that the practicum held. The author noticed that the adults were impressed with the achievements of the students and the manner in which the instructions had been designed and the practices had been provided to the students.

Overall, the practicum was successful. All of the objectives were met and the students showed improvements in cognition, social-emotional and self esteem levels. The practicum was also successful in regards to the impact that it had on parents and staff.

CHAPTER V

Recommendations

The investigator understands that changes in the needs of parents and children that are mentally handicapped occur from year to year. Based on these demands and needs, the author also realizes that the educational settings that provide the essential needs for such students must change in order to provide the most complete care and assistance to these students. Throughout the practicum the author has been reviewing the latest information regarding these students and has accumulated a lot of valuable information that will be kept on file at the school setting to provide a constant reference and resource of material. This information will be used to increase and adjust the existing program to maximize potential for the students. A copy of all the material gathered, as well as the actual practicum itself, will be kept at the school site and at the main office. The practicum author will share all of the information gathered with the other teachers that are employed by the organization in which the practicum took

place. The author will also provide information to the parents, therapists and directors that are looking for suggestions or information on how to aide their children and/or students through the use of computers and/or manipulatives.

This study could be replicated in other similar school settings that have not yet established a computer-based-instruction and manipulative program to enhance cognitive skills in mentally handicapped preschoolers. This study could also be extended to include the computer-based-instruction and the manipulative program in the existing curriculum. This would include computers and manipulatives in the realm of early intervention programs.

This practicum would also benefit any elementary school setting whether the students were disabled or not. All children need to experience such practices and have the opportunities to experience for themselves both computer and manipulative instruction in order to receive a full rounded education. The implementation of this practicum in any such setting would be greatly beneficial.

At a future time, additional objectives could be added in the Fine Motor, Gross Motor, Language and Self-

Care domains that would increase these skills. For instance, the manipulative and computer-based-instruction could be easily modified to include activities in all of the above-mentioned domains. Both Fine Motor and Gross Motor could be increased through manipulative and computer stimulation that would be geared towards motor development. Self-Care could also be increased through extra practices and activities that would allow the students to experience feeding, toileting and dressing opportunities more often. Language is also easily integrated in all of the activities due to the necessity of understanding receptive language and being able to use expressive language adequately. Language can be promoted in conjunction with any of the above-mentioned domains. Language activities through manipulatives and computers would be very beneficial in providing constant opportunities for speech and language.

Besides modifying the objectives to include the above-mentioned domains, adjustments could be made to include older children and to focus on more intense and functionally appropriate manipulative experiences and computer simulations that would promote critical thinking skills and problem solving abilities for mentally handicapped children, regardless of their ages. These

types of activities would promote the use of functional skills and facilitate the transferring of such skills from a simulated and concrete practice to one that is functional and necessary in real life, thus aiding mentally handicapped or non-handicapped children to be able to function appropriately in every day settings.

The practicum will be continued in the classroom in which it was implemented through the summer months. At that time the achievements of the students will again be evaluated and the directors, parents and teachers will determine the permanence of the program. If the practicum is continued it will be implemented as part of the curriculum and activities will be created for the different classrooms to implement.

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APPENDIXES

Appendix A

DEVELOPMENTAL PROGRAMMING FOR INFANT AND YOUNG CHILD: EARLY INTERVENTION DEVELOPMENTAL PROFILE

Name _____ Cognition

Item Number	Developmental Levels and Items	Date
	0 - 2 months	
49	Uses adaptive movements rather than reflexive reactions	-
50	Brings hand to mouth	-
51	Repeats random movements	-
	3 - 5 months	
52	Mouths object	-
53	Shakes rattle	-
54	Looks at object s/he is holding	-
55	Tracks rolling ball momentarily screened	-
	6 - 8 months	
56	Attains partially hidden object	-
57	Looks to the floor when something falls	-
58	Uncovers face	-
59	Bangs object	-
60	Rotates a bottle less than 180 degrees to drink	-
61	Imitates hand movements already in his/her repertoire	-
	9 - 11 months	
62	Attains completely hidden object	-
63	Pulls string to secure ring and succeeds	-
64	Shows knowledge of toy hidden behind a screen	-
65	Imitates facial movements inexactly	-
66	Imperfectly imitates movements never performed before	-
67	Rotates a bottle inverted 180 degrees to drink	-
68	Reacts to novel features of an object	-

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Cognition

Item Number	Developmental Levels and Items	Date
	12 - 15 months	
69	Imitates body action on a doll	-
70	Repeatedly finds toy when hidden under one of several covers	-
71	Lifts a half inch cube off a one inch cube	-
72	Balances nine one-inch cubes in a coffee cup	-
	16 - 19 months	
73	Repeatedly finds toy when hidden under multiple covers	-
74	Uses a stick to try to attain an object out of reach	-
75	Retrieves raisin by inverting small vial	-
76	Corrects imitations of new movements	-
77	Deduces location of hidden object, single displacement	-
78	Pulls cloth to reach object	-
	20 - 23 months	
79	Imitates unseen body movements immediately and exactly	-
80	Attempts to activate flashlight	-
81	Deduces location of hidden object, multiple displacement	-
82	Anticipates path of rolling ball by detouring around object	-
83	Matches two sets of objects by item	-
	24 - 27 months	
84	Imitates a model from memory	-
85	Matches two sets of objects by color	-
86	Assembles three-piece body puzzle correctly	-
87	Recognizes four pictures from reduced cues	-
	28 - 31 months	
88	Matches colored cubes (red, yellow, blue, green and black)	-
89	Understands concept of one	-
90	Identifies three objects by their use (car, penny and bottle)	-

Cognition

Item Number	Developmental Levels and Items	Date
	32 - 35 months	
91	Repeats two digits	-
92	Matches four shapes (circle, square, star and cross	-
93	Inverts a picture	-
94	Names a missing object	-

Name_____ Social/Emotional

Item Number	Developmental Levels and Items	Date
	0 - 2 months	
136	Quiets when picked up	-
137	Quiets to face or voice	-
138	Maintains brief periods of eye contact during feeding	-
139	Smiles or vocalizes to talk or touch	-
	3 - 5 months	
140	Watches adults walk across room	-
141	Reflects silent adult's smile	-
142	Smiles or reaches to familiar people	-
143	Smiles or laughs during physical play	-
144	Smiles spontaneously	-
145	Smiles at image in mirror	-
	6 - 8 months	
146	Prefers to be with people	-
147	Laughs and smiles at pat-a-cake and peek-a-boo games	-
148	Reaches for image of self in mirror	-
149	Explores features of a familiar person	-
	9 - 11 months	
150	Leaves physical contact with familiar person momentarily	-
151	Participates in pat-a-cake and peek-a-boo games	-
152	Performs for social attention	-
153	Offers toy	-
	12 - 15 months	
154	Responds differentially to young children	-
155	Gives toy to adult	-
156	Initiates ball play or social games	-
157	Leaves contact with familiar person repeatedly	-
	16 - 19 months	
158	Plays apart from familiar person for five minutes	-
159	Varies play with one toy	-

Social/Emotional

Item Number	Developmental Levels and Items	Date
160	Approaches a young child	-
	20 - 23 months	
161	Occasionally plays near other children	-
162	Shows periods of strong independence	-
163	Picks up and puts away toys on request	-
164	Imitates domestic activities	-
	24 - 27 months	
165	Independently chooses a toy and begins to play	-
166	Pretends to be engaged in familiar activities (being asleep or telephoning)	-
167	Prefers to play near, but not with, other children	-
	28 - 31 months	
168	Discriminates between boys and girls	-
169	Identifies self in mirror	-
170	Plays with other children	-
	32 - 35 months	
171	Separates from familiar person in strange environment for five minutes	-
172	Identifies own sex	-
173	Shares toy with adult prompt	-

APPENDIX B

CURRENT EARLY INTERVENTION PROGRAM QUESTIONNAIRE

Appendix B

Current Early Intervention Program Questionnaire

About your family:

My yearly family income is:
$ 0 - $30,000 $30,001 - $40,000
$40,001 - $55,000 $55,001 - $65,000
$65,001 - higher

I am currently working.....Y N

My spouse is currently working.....Y N

I have ____ child/children.
1 2-3 4 or more

I have ___ child/children enrolled in the program.
1 more than one

My child/children has (have) been in the program ___ years.
1 2 3

My child/children has(have) improved in the program.....Y N

My child/children is(are) functioning_____.
below age level at age level above age level

About my child/children:

My child/children tries(try) to accomplish new things on their own.....Y N

My child/children is(are) friendly to others....Y N

My child/children is(are) shy with others.....Y N

My child/children is(are) curious.....Y N

My child/children likes(like) to be with others.Y N

My child/children likes(like) to be praised....Y N

My child/children praises(praise) him/herself..Y N

Personal desires of program:

I would like to see more hands-on activities....Y N

I would like to see computers in the classroom..Y N

I would like to have manipulatives at home to work with my child/children.....Y N

I would like to learn new ways to help my child/children learn.....Y N

What strengths do you feel the program possesses? Please explain._____

_____

_____

_____

What weaknesses do you feel the program possesses? Please explain._____

_____

_____

_____

Thank you for your time and responses to this questionnaire.

APPENDIX C

LIST OF SPECIFIC DEVICES FOR COMPUTER ADAPTATIONS

APPENDIX C

LIST OF SPECIFIC DEVICES USED FOR COMPUTER ADAPTATIONS

Here are a list of specific devices used to implements the most productive use of computer-based-instruction within the mentally handicapped classroom selected for the practicum.

1. Touch Screens and Tracking Ball- used with children to directly choose options on the program and make the program run effectively.

2. Speech Synthesizer and/or Voice Box- used with those students that have speech impairments.

3. Joystick and/or Mouse- used for young children to facilitate the running of the program.

4. Special Adaptive Switches or Pushbuttons- used for young children actively participate with the program. It also allows them the ease of using their own physical limitations to participate with the program.

5. Graphic Pads- used to create or copy original pieces of work. Allows creativity and choice of creations.

6. Key Guard- used to reduce the possibility of hitting the wrong keys as students attempt to enter information or answer a question from the program.

Information gathered from the actual devices available for use at the class site that were needed for the targeted infants. The information was put together by the practicum author. There were no copyright laws infringed.

APPENDIX D

OBJECTIVES AND ACTIVITIES CHOSEN FOR COGNITIVE DEVELOPMENT FOR THE TARGETED STUDENTS

APPENDIX D

COGNITIVE OBJECTIVES AND ACTIVITIES: FOR ALL STUDENTS

Objectives:

1. Imitates a model from memory.
2. Matches two sets of objects by color.
3. Assembles three-piece body puzzle correctly.
4. Recognizes four pictures from reduced cues.
5. Matches colored cubes.
6. Understands concept of one.
7. Understands concept of two.
8. Matches four shapes.
9. Understands concept of letters.
10. Identifies four different shapes.
11. Identifies numbers 1-3.
12. Identifies letters A-C.

Activities:

Shapes:

1. Matching felt shape pieces.
2. Coloring shapes.
3. Sorting items with different shapes.
4. Identifying items with different shapes.
5. Using various computer programs that deal with shapes.
6. Playing games such as "Step on your Shape".
*7. Other tactile stimulation activities involving shapes.

Colors:

1. Matching items that have the same colors.
2. Painting with different colors.
3. Identifying objects with similar colors.
4. Sorting items with the same colors.
5. Using different computer programs on colors.
6. Creating items with different colored clay.
7. Playing games such as "Grab that Color".
*8. Other tactile stimulations with colors.

Letters.

1. Matching the same letters.
2. Identifying the right letter.
3. Choosing the letter named.
4. Coloring or painting the letters.

5. Hearing and saying words that start with the letters.
6. Using the computer programs on letters.
*7. Other stimulating activities with letters such as singing songs and dancing.

Numbers:
1. Matching the same numbers to each other.
2. Counting the right number of items.
3. Showing the right number of counters.
4. Coloring the right number.
5. Gross Motor games such as "Clap that Number".
6. Using the computer programs that deal with numbers.
*7. Other tactile stimulation activities with numbers.

APPENDICES E - H

BI-WEEKLY CHECKLISTS FOR COGNITIVE DEVELOPMENT OF CHOSEN OBJECTIVES

APPENDIX E

CHECKLIST FOR SHAPE OBJECTIVES MASTERED

Place a check in front of the objectives mastered.

1.__ Imitate a shape model with a concrete sample before them.

2.__ Imitate a shape model from memory.

3.__ Match items by shape.

4.__ Sort items by shape.

5.__ Identify a circle.

6.__ Identify a square.

7.__ Identify a triangle.

8.__ Complete a 3 piece shape puzzle.

APPENDIX F

CHECKLIST FOR COLOR OBJECTIVES MASTERED

Place a check in front of the objectives mastered.

1.__ Imitate a color model with a concrete sample before them.

2.__ Imitate a color model from memory.

3.__ Match items by color.

4.__ Sort items by color.

5.__ Identify the color red.

6.__ Identify the color blue.

7.__ Identify the color green.

8.__ Identify the color yellow.

9.__ Complete a 4 color puzzle.

APPENDIX G

CHECKLIST FOR LETTER OBJECTIVES MASTERED

Place a check in front of the objectives mastered.

1.__ Identify the letter A.

2.__ Identify the letter B.

3.__ Identify the letter C.

4.__ Match the same letters.

5.__ Sort the three different letters by shape.

6.__ Complete a 3 piece letter puzzle.

APPENDIX H

CHECKLIST FOR NUMBER OBJECTIVES MASTERED

Place a check in front of the objectives mastered.

1.__ Imitate a number model with a concrete sample before them.

2.__ Imitate a number model from memory.

3.__ Match the correct number to the same number of items.

4.__ Identify the number 1.

5.__ Identify the number 2.

6.__ Identify the number 3.

7.__ Choose the correct number asked for.

8.__ Complete a puzzle of numbers.

APPENDIX I

SELF ESTEEM RATING SCALE

APPENDIX I

SELF ESTEEM RATING SCALE

Circle the appropriate rating for the student.
1-never 2-rarely 3-sometimes 4-often 5-always

My child/student

1. is happy.....1 2 3 4 5
2. is attentive.....1 2 3 4 5
3. is easily encouraged.....1 2 3 4 5
4. is easily motivated.....1 2 3 4 5
5. is easily excited when rewarded.....1 2 3 4 5
6. enjoys verbal praise.....1 2 3 4 5
7. praises self verbally.....1 2 3 4 5
8. is content with self when she/he does something correctly.....1 2 3 4 5

I would rate my child's/student's self esteem to be

3 - High

2 - Average

1 - Below-Average

APPENDIX J

SURVEY TO EVALUATE FINAL RESULT OF PRACTICUM

APPENDIX J

FINAL EVALUATION SURVEY

Number of children in the program_____

Time in the program_____

Please rate the following aspects of the program by circling your best choice 5 being very successful and 1 being very poor.

The computer-based-instruction was..... 5 4 3 2 1

The manipulative program was..... 5 4 3 2 1

My child improved cognitively..... 5 4 3 2 1

My child seems more aware of:

shapes..... 5 4 3 2 1

colors..... 5 4 3 2 1

numbers..... 5 4 3 2 1

letters..... 5 4 3 2 1

My child feels better about him/herself... 5 4 3 2 1

I feel the overall program was..... 5 4 3 2 1

Would you like to see the program continued? yes no

Please make any recommendations or suggestions about the program in the space provided_____

_____

_____

_____