Increasing the Number of

Body Parts On a Draw-a-Person

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A Special Project

Presented to

Dr. Gordon Martinen

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FACULTY APPROVAL

Increasing the Number of

Body Parts On a Draw-a-Person

Approved for the Faculty

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ABSTRACT

In this project the researcher speculated that the number of body parts drawn in a draw-a-person would increase following the Mat Man activities of the

Handwriting Without Tears curriculum. Preschool children drew two different draw-a-person drawings; one before the Mat Man activities and one after. The activities included building Mat Man, a body made up of twenty-four parts, using wooden pieces and foam cut outs. Mat Man was made twice. Once by the researcher and a second time by the preschool students. The Mat Man song was played both times. The researcher modeled drawing Mat Man on chart paper before the children completed their second drawing. The number of body parts present on each drawing were compared.

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CHAPTER 1

Introduction

Background for the Project

The researcher attended a seminar on the Handwriting Without Tears (HWT) curriculum and elected to implement the curriculum in an integrated preschool classroom. The HWT curriculum "uses a developmental approach, grouping the letters by difficulty and teaching a handwriting style that uses simple, vertical lines" (Case-Smith, 2002). The HWT curriculum employed a variety of materials including wooden pieces to form letters, individual chalkboards, individual magnetic stamp and see boards, sculpting dough with letter cards, songs, finger plays, and workbooks. The various

materials used “complement all learning styles of children (visual, auditory, tactile, and kinesthetic). Research shows that achievement is significantly increased with multi-sensory instruction” (learningstyles.com, 2004).

The researcher’s undergraduate coursework had not included formal training in teaching handwriting. Review of the research on handwriting revealed that this was not uncommon. More than 200 elementary teachers were “asked if they felt prepared to teach handwriting, 90 percent responded that they did not. Very few, if any, colleges of education offer courses in the teaching of handwriting” (Bowen, 2003).

The researcher’s previous handwriting instruction at the preschool level included tracing and copying the basic forms found on the Visual Motor Inventory (VMI), draw-a-person, first name writing, and copying simple three or four letter words from a model. All of these were paper and pencil activities. These activities were not motivating for all students, or sensitive to individual learning styles. The researcher understood the need to teach to the multiple intelligences and various learning styles, but did not have any knowledge of how these applied to handwriting instruction. The

HWT curriculum improved the researcher's instruction style. "Teachers should structure the presentation of material in a style, which engages all or most of the intelligences" (Nolen, 2003).

Initial handwriting instruction should be focused on the correct formation of letters. Children who do not scribe their letters in the proper way slow down their production of written work. If children cannot form letters correctly they will have difficulty writing large volumes quickly and legibly. Discouraged writers generally had problems with speed, legibility, and fluency. "Legible handwriting is a practical asset for students. Even in this age of word processors, the legibility of learners' handwriting can have a profound impact upon their learning and acceptance of their ideas" (Farris, 2001).

Statement of the Problem

The researcher's past handwriting instruction had shown fine motor growth for some learners, but not the entire group. The lack of formal training in handwriting instruction, and a self-made handwriting curriculum, left the researcher puzzled on how to best teach handwriting to preschoolers. The researcher sought the HWT curriculum for improved instruction and

student performance. Drawing skills develop before letter writing skills. The drawing skills of the preschool children will be measured in this study.

Purpose of the Project

The researcher proposed that preschool children's drawings improved following HWT activities, and that more body parts occurred in preschool children's draw-a-person following the Mat Man activity of the HWT curriculum.

Delimitations

The HWT curriculum was introduced in the integrated preschool class of the 2006-2007 school year. Three activities from the HWT curriculum were presented weekly in small, adult-directed groups. Additional whole group instruction occurred as called for by the HWT curriculum. Whole group instruction included songs, finger plays, and the Mat Man activity. The researcher accessed two school district Occupational Therapists who were trained in the HWT curriculum when any implementation questions or concerns occurred.

Assumptions

Lessons from the HWT curriculum were developmentally appropriate and presented in a variety of interactive formats that were enjoyed by the preschool children. The HWT curriculum incorporated several learning styles, and provided consistent phrasing and repetition of skills. Teaching with an actual curriculum provided a more systematic approach to teaching handwriting.

Hypothesis

Preschool children who have been instructed in the Handwriting Without Tears Mat Man activity will improve their fine motor skills as evidenced by the increased number of body parts present in their draw-a-person.

Null Hypothesis

Following instruction with the Handwriting Without Tears Mat Man activity no significant impact is demonstrated by preschool children with regards to the number of body parts present in their draw-a-person. Significance was determined for $p \geq .05$, .01, and .001.

Significance of the Project

With increased Kindergarten expectations, preschool children's writing skills must be addressed. Kindergarten teachers in the researcher's school district required handwriting on the first day of

school. Preschool children needed handwriting instruction before Kindergarten attendance. The intended purpose of the HWT curriculum adoption for preschool children included increased school readiness for Kindergarten due to improved handwriting skills.

Procedure

The researcher instructed preschool children to draw-a-person on a blank sheet of paper. The completed drawings were gathered and the children's names were added. The researcher then presented the Mat Man activities from the HWT curriculum. The researcher then instructed the children to draw Mat Man on a blank sheet of paper. The researcher collected the drawings as completed and added the children's names. The pair of drawings for each child were then compared with regard to the number of body parts present.

Definition of Terms

basic forms. Shapes drawn by children in a developmental order. For preschool aged children shapes included: a horizontal line, a vertical line, a circle, a cross, a slash, a back slash, a square, an "X", and a triangle.

bilateral hand skills. Both hands used together at the same time for task completion.

copying. When a shape or form are drawn following a demonstration or after a written example was provided.

directional terms. In written work these terms were: top, bottom, left, right, front, back, beside, under, over, beside, next to, around, and across.

draw-a-person. A pencil and paper representation of the human body.

integrated preschool. A preschool class with children from three funding sources. 1) The children qualified as developmentally delayed under Special Education criteria were funded by Special Education. 2) Washington State's Early Childhood Educational Assistance Program funded children whose families qualified as low income based on the federal poverty guidelines. 3) Children with typical development from families that paid monthly tuition for attendance.

kinesthetic feedback. Input, or sensations, to the hand given by the writing instrument; vision not required.

magnetic stamp and see boards. Wooden pieces with a magnetic strip on one side used in the Handwriting Without Tears curriculum to stamp the big lines, little

lines, big curves, and little curse on the magnetic board for making letters and tracing them.

mat man. An activity from the Handwriting Without Tears curriculum used to teach children how to draw the human form. This activity used wooden pieces, music and lyrics, movement, paper and pencil.

mid-line. The center of one's body, which requires brain collaboration between the two hemispheres, in order for each side of the body to cross over this center point.

pencil grasp. A writing instrument held in the hand for efficient writing.

posture and balance. Ability to sit upright, without falling, while the arms were used for writing.

shoulder girdle development. Strength and coordination required of the bones and muscles in the shoulders for coordinated movements.

tracing. Written work done directly on top of an example.

upper extremity control. Controlled movements of one's arms for precision and with varied strength.

verbal prompts. When words were used to provide additional instruction or encouragement.

visual motor control. Coordinated movements of the eyes, hands, and arms at the same time.

writing instruments. All objects held in the hand to make marks on paper, chalkboards, or other surfaces. Included are pencils, colored pencils, crayons, markers, chalk, ink pens, and paint brushes.

wooden pieces. Manipulatives used in the Handwriting Without Tears curriculum that come in two shapes and two sizes. Big lines, little lines, big curves and little curves. The wooden manipulatives were used to form the letters of the alphabet.

workbooks. Individual student booklets printed with activities and letters where preschool children practiced coloring and tracing.

Acronyms

ECEAP. Early Childhood Educational Assistance Program

GLEs. Grade Level Expectations

HWT. Handwriting Without Tears curriculum

NCLB. No Child Left Behind Act

OT. Occupational Therapy

OSPI. Office of the Superintendent of Public Instruction in Washington State

SAT. Scholastic Aptitude Test

VMI. Visual Motor Inventory

WASL. Washington Assessment of Student Learning

CHAPTER 2

Review of Selected Literature

Introduction

The author reviewed literature related to learning theories, both those that included stages of development in young children and learning preferences or styles. Student assessments in Washington State as well as college entrance testing that required handwritten work were also reviewed. Literature and research in motor development, specifically fine motor development, were selected. Handwriting instruction practices and research concerned with such instruction completed the literature reviewed.

Learning Theories and Theorists

Young children were often the subjects of research. Many theorists claimed that children developed in predictable sequences. Maria Montessori, Jean Piaget, Lev Vygotsky, and Howard Gardner have each presented their view of child development and how children were best instructed so that they attained their greatest potential.

Maria Montessori focused her research on children in poverty. Montessori developed a curriculum for young children based on her theory of development. Montessori theorized that each child had innate and unique potential that only required "the right environment to encourage what is within to evolve" (Vardin, 2003). Moral development, cognitive development, and emotional development were the focus of the Montessori curriculum (Haines, 2000). With these three categories in mind, five distinct areas were developed for the classroom preparation for three to six year old children. The five areas were practical life, sensorial, mathematics, language arts, and cultural activities (NAMTA, 2006). Maria Montessori believed that children were driven to teach themselves and that the best environment for this was one in which the children were in multi-aged groups and

able to access their own self-correcting materials for an extended block of time. Montessori believed that environment and peer interactions provided more learning opportunities because they followed the natural interest of the child. An additional component of the curriculum included ongoing observations and analysis of each children focused on their interests and mastery of skills. This observed information was used to enhance the manipulatives and environment so that the needs of the children were addressed.

Jean Piaget believed that children had cognitive stages of development and were only able to succeed at tasks within their current developmental stage. These stages were linked to age ranges. Preschool children were classified in the pre-operational stage and were described with "learns to use language and to represent objects by images and words, thinking is still egocentric" (Atherton, 2005). In addition, "Piaget described characteristic behaviors, including artistic ones such as drawing, as evidence of how children think and what children do as they progress beyond developmental milestones into and through stages of development" (Luehrman and Unrath, 2006).

Lev Vygotsky proposed the zone of proximal development that embodied the "concept of readiness to learn that emphasizes upper levels of competence" (Bransford, Brown and Cocking, 2000, p.81). Behind this theory was the idea that "what a child can perform today with assistance she will be able to perform tomorrow independently, thus preparing her for entry into a new and more demanding collaboration" (Bransford, Brown and Cocking, 2000, p.81).

Howard Gardner theorized every individual had eight different multiple intelligences in various stages of development and use. These intelligences "are used concurrently and typically complement each other as individuals develop skills or solve problems" (Scholastic Early Childhood Today, 2005). The eight intelligences were labeled: logical-mathematical, linguistic, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal, and naturalist. Gardner also "challenged the notion that intelligence is something that can be objectively measured and reduced to a single quotient or score" (Stanford, 2003).

There were several similarities between Montessori and Gardner. Montessori and Gardner "observed that individual differences begin to be revealed in the

earliest years of life, and that individual strengths in one area of ability do not necessarily ensure or predict strengths in other areas" (Vardin, 2003). Both Gardner and Montessori believed that environment played a role in a child's development. Montessori "strongly believed that the child's mind absorbs the environment, leaving lasting impressions upon it, forming it, and providing nourishment for it" (Vardin, 2003). While Gardner postulated "that the 'smarter' the environment and the more powerful the interventions and resources, the more competent individuals will become"(Vardin, 2003).

Montessori equipped classroom environments with materials for a wide age range and observed that children learned by both active participation with the materials and by interactions with their peers. Gardner labeled this type of learning as bodily-kinesthetic and interpersonal. Both theorized that children were able to reach their fullest potential when the environment motivated and enhanced their existing skills and provided opportunity for increased exposure to novel activities and approaches.

The Importance of Handwriting

The No Child Left Behind Act of 2001 (NCLB) brought about a "focus on content and achievement standards and educational accountability" (National Joint Committee on Learning Disabilities, 2006). The trickle down effect of this act has reached the preschool level, "policy makers believe that an early start on developing academic skills will help children reach the standards they are expected to achieve in elementary school" (Stipek, 2006).

The State of Washington adopted Early Learning and Development Benchmarks for birth to kindergarten entry aged children. "The research suggests that oral language, phonological sensitivity, concepts about print, alphabetic knowledge, invented spelling, rapid naming, and the ability to write one's own name prior to kindergarten are early indicators of literacy success" (National Early Literacy Panel, 2005).

Students were held accountable for their handwriting on the Washington Assessment of Student Learning (WASL). The WASL fulfilled the testing requirement of NCLB. Both a narrative prompt and an expository prompt were included in the writing component of the WASL. Washington Assessment of Student

Learning scores for writing were based on conventions, content, organization, and style. Student's WASL scores were affected by illegible handwriting.

Washington State adopted Grade Level Expectations (GLEs), which listed skills students at each grade level must learn for ensured success on the WASL. Stated in the Washington writing GLEs booklet,

> writing is essential to a literate society and the catalyst for creating the future. Writing can be an act of discovery, of communication, of joy. It connects us to work, to culture, to society, to existing knowledge, and to the meaning of our lives. Written Language provides the means to convey our understanding and knowledge; in fact, it is the tool we use to demonstrate understanding in all areas. Finally, writing is a valuable and marketable lifelong skill (OSPI Document Number 05-0045, 2005, p.4).

In 2005 the Scholastic Aptitude Test (SAT) added a two page, handwritten, timed essay section. "With the new handwritten essay coming to the SAT in 2005, legible, rapid handwriting suddenly matters. Failure

to command this skill could cost a student four hundred points on his score" (Gladstone as quoted by Bowen, 2003). Scholastic Aptitude Test scores of students who struggled with written work were impacted by this timed writing test. "Non-proficient hand writers cannot keep up with their ideas. The composition process becomes disrupted with the mechanics of letter formation and spelling, and the result is a composition that lacks coherency, content and sufficient length" (Graham quoted by Bowen, 2003).

Development of Motor Skills

Motor skills developed in a predictable and sequential way, "development proceeds in a cephalo-caudal (head to toe) and proximal-distal (moving from the body parts closest to the trunk to those furthest away)" (Fingergym). Use of the large muscles were referred to as gross motor skills, while fine motor skills involved the small muscles of the hands and feet. Gross motor skills become developed before the fine motor skills required for handwriting. The refined muscles of the hand developed last. Developmentally appropriate classrooms "support the development of the hand and finger muscles needed to correctly hold and

use pencils and scissors rather than force them to do writing activities before they are ready" (Fingergym).

When gross motor skills were developed and used, fine motor skills were supported and improved. The gross motor skills of trunk and shoulder stability play a vital role in handwriting. Fine motor learning activities needed to follow periods of gross motor movement "to 'awaken' the larger muscle groups and ready them to act as support and stabilizers necessary for engagement in fine motor activities" (Fingergym).

Fine motor skills were improved and refined by repeated use. "Children need activities that promote discovery and experimentation" (Kaminstein, 2006) Children were adversely affected when both gross motor and fine motor play and exploration were limited or restricted. The "lack of opportunity to play and experiment with graphic materials will have developmental consequences"(Landy and Burridge, 1999). Novel activities were required to keep children interested and engaged in repeated fine motor activities. "Children need varied repetition. Children learn from repetition, but they learn best when the repetition takes various forms" (Kaminstein, 2006, p.2).

The Development of Handwriting

Learning to write was tied to school success because "a child who can write well has improved confidence and self-esteem, increased concentration on content, improved academic performance" (Naus, 2000, p.64). Schools required children to write when enrolled in kindergarten.

Writing begins with scribbling. Scribbles can be made by young children as early as eighteen months. Due to the lack of fine motor control young children hold writing instruments with the whole hand, or fist, when they scribble. "Scribbling is a natural gateway to muscle control and coordination" (Crosser, 2007). Fine motor skills were refined by repeated use of writing instruments. Random scribbles precede controlled scribbles where the child becomes "aware that marks on a page can stand for objects or people, but they are often unsure of what their own marks represent" (Baghgan, 2007, p.21). Young children often requested adults or older children to label their scribbles. Once children become more experienced with scribbling the children label the written scribbles themselves. "This naming scribbling stage is important in children's development of abstract thought because

it indicates a shift from a focus on physical control to a clear understanding that the marks made on the paper are symbols for real things" (Baghban, 2007, p.22). In the next stage of development children became aware that drawing and writing were different. "Younger children tend to find it easier to draw than to write. The frequent predominance of drawing in development is important because drawing promotes the first writing" (Baghban, 2007, p.22). Baghban observed, "until about age seven, young children may perceive the difference between drawing and writing but still draw when asked to write" (Baghban, 2007, p.24).

Pre-printing skills, and directionality activities, were needed before handwriting instruction. The Skill Builders website listed six required pre-printing skills, which were: "posture and balance, shoulder girdle development, upper extremity control, pencil grasp, bilateral hand skills, and visual motor control" (Skill Builders, 2002).

Frederick County Public Schools developed and posted an online handwriting resource that listed seven pre-printing skills. These skills were: "ability to cross midline, ability to use two hands, understanding of directional terms, ability to recognize similarities

and differences in forms, hand dominance, functional pencil grasp, and ability to copy line and shapes" (Frederick County Public Schools, 2003).

Children supported in pre-printing skill development were prepared for handwriting instruction once these skills were acquired. School aged children "spend approximately 60-70% of their time completing fine motor work or activities" (Landy and Burridge, 1999). Fredrick County Public Schools noted "before receiving formal handwriting instruction, students must be able to form basic strokes in the appropriate direction and with clean, precise intersections" (Frederick County Public Schools, 2003).

Directional terms that children needed to understand included top to bottom, and left to right. These directional concepts were incorporated in both writing and reading. Children who understood these terms had a head start in the language arts.

A student's lack of automatic handwriting will effect their written work due to the frequent delays needed to recall how to make individual letters in a word. Automatic handwriting became necessary for school success. Automatic handwriting allowed students to concentrate on the content of their written work rather

than the directionality and letter formations needed. The Zaner-Bloser handwriting curriculum stated that students

> focused on letter construction. . . . have fewer attentional resources to devote to the meaning-making aspects of composing. Frequent, brief, explicit instruction that helps young children learn to automatize letter production and retrieve letter forms rapidly from memory may increase the probability that they will become skilled writers (Zaner-Bloser, 2007).

Handwriting instruction done in small groups assured individual feedback. Children shown the correct way to form letters were given time to practice these formations under adult supervision so that bad habits were not formed. "As with all emerging skills, what is learned right from the start will shape lifelong habits and abilities. Writing is a skill used to express thoughts and communicate. A fundamental part of writing is the learning and forming of letters" (ERIC Clearinghouse on Reading, English, and Communication Digest #124, 1997, p.1)

Once Children were accomplished with letter formations they

> substitute visual for kinesthetic feedback in the early elementary years, the switch to kinesthetic feedback should be made eventually to produce faster handwriting. If this switch is not made, the increasing demand for writing production in later elementary years may result in academic productivity problems (Marr, Windsor, & Cermack, 2001 p.2)

The environment impacted handwriting acquisition. Children from print rich environments where adults modeled writing understood the importance of writing and were inspired to learn to write. This happened because "children watch adults write and notice print in the home, the classroom, and the community, they come to understand that print communicates information" (Koralek, 2007, p. 10).

Summary

Children learned from their environment in a variety of interactive ways. Motor skill development

can be enhanced by these interactions. Both gross motor and fine motor skills must be developed before formal writing instruction. Developmental milestones for motor skills must be understood by teachers to be supported and enhanced in children. Schools focused on pre-printing skills that provided activities for increased pre-printing skill development understood the developmental stages of children's writing. Once teachers were assured that the children possessed the necessary pre-printing skills required, formal handwriting instruction was begun. The ability to communicate through written work became required in schools and the industrial world.

Montessori believed the environment enhanced the child's abilities. Piaget also believed that environment played an important part in the acquirement of skills necessary to move on to the next stage. Vygotsky called this readiness to learn the zone of proximal development, while Gardner theorized that all individuals possessed eight different multiple intelligences in various stages of development and use. Each of these educational theorists understood that skills developed over time, and required the individual child's developmental level to be ready to benefit from

the instruction. To date, individual child development has not been taken into account by the governmental agencies that imposed educational standards regarding student academic skills including written work.

Chapter 3

Methodology and Treatment of Data

Introduction

The researcher understood that drawing skills came before written letters or words. With this in mind, the researcher wondered if preschool children could add more body parts to their draw a person following group instruction with the Handwriting Without Tears (HWT) Mat Man activities. The HWT workshop attended by the researcher had given many pre and post examples of drawing a person that showed remarkable improvements. The researcher chose to have preschool children draw-a-person before and after the HWT Mat Man activities.

Methodology

The researcher conducted a correlational study and used a convenience sample of 31 preschool students to compare the number of body parts drawn in pre and post draw-a-person. Mat Man activities from the HWT curriculum were used between the two drawings. The researcher compared the number of body parts drawn on the pre and post drawings for each student.

Participants

The thirty-one children in the study attended an integrated preschool classroom four half-days per week. The enrolled children were four years old on or before August 31, 2006. The children in this preschool came from three funding sources. The first funding source

was Special Education, the second was tuition paying families, and the third was Early Childhood Educational Assistance Program (ECEAP). Four of the Preschool children who qualified for Special Education received occupational therapy (OT) services where additional instruction with the HWT curriculum occurred. The participants were in two different sessions of preschool. The morning session had sixteen students. There were ten males (five White, three Hispanic, one Black, and one Pakistani) and six females (five White and one Native American). Seven students were tuition funded, six were funded by ECEAP, and three were funded by Special Education. All of the Special Education funded children received OT. The children ranged in age from four years and four months to five years and two months. The afternoon sessions consisted of fifteen students. There were ten males (seven White, two Hispanic, and one Native American) and five females (three White and two Hispanic). Two students were tuition funded, eleven were funded by ECEAP, and two were funded by Special Education. One of the Special Education students received OT services. The children ranged in age from four years and three months to five years and two months.

Instruments

The children were given a blank eight and one-half inch by eleven inch piece of paper and a thin felt tipped marker for drawing a person for both the pre and post drawings. The drawings were collected by the researcher who wrote the student's name on them after each drawing session. The researcher then compared the two drawings for each child and tallied the number of body parts deciphered on each.

Design

This was a correlational study for a group of preschool students in an integrated preschool program. The children attended two different sessions of preschool, but were counted as one whole group for the pre and post drawing data. The pre and post drawings were completed over a thirty-minute period following outdoor play, and occurred on the same day for both the morning and afternoon sessions. The drawings were done as whole groups, without adult prompting or comments beyond "draw a person", "draw your self", draw your mom", "draw your dad", or "draw Mat Man".

A weakness of the study was that the drawings took place in a whole group setting so that the researcher was not able to watch how each child went about the

drawing. The children were not asked to label their drawings so the researcher may have missed some body parts the child had considered drawn correctly or in an alternate location.

Procedure

During each session of preschool, morning and afternoon, the preschool children returned to the classroom following fifteen minutes of outdoor play. They were instructed to sit at the tables and draw a person on the white paper in front of them with the thin felt tipped marker provided. Additional verbal prompts of "draw yourself", "draw your mom", or "draw your dad" were given to children who had not begun to draw immediately. Once all of the children had completed their drawings they were instructed to go to the circle area of the classroom where the researcher demonstrated the Mat Man activities. The researcher played the Mat Man song from the HWT curriculum and built Mat Man with the wooden pieces on the floor in front of the children as instructed by the song. Once Mat Man was completed, the researcher asked the preschool children to name the body parts as the researcher pointed to the body parts in the order presented in the Mat Man song. Body parts not listed

in the song that were included were hair, eyebrows, and a bellybutton. Then the researcher passed out all of the body parts ensuring that each child had at least one piece of Mat Man. The Mat Man song was played again and the children reconstructed Mat Man on the floor. Children who failed to put their piece in place when the song prompted were given an additional verbal prompt by the researcher. Once completed, the researcher again asked the children to name the body parts of Mat Man in the order that the song had presented them. The researcher then asked the children to watch as Mat Man was drawn on a large piece of chart paper. The researcher drew the body parts of Mat Man in the same order as the song, and verbally labeled the parts as they were drawn. After the researcher completed the drawing, the children were instructed to return to the table and draw Mat Man on a blank piece of paper. The researcher's drawing of Mat Man was not visible to the children while they drew their own Mat Man. The researcher collected the drawings as the children finished. The researcher added the child's name on the drawings.

The researcher compared the two drawings of each child and counted the number of body parts present.

Body parts were counted as one head, one head of hair, two eyes, two eyebrows, two sets of eyelashes, one nose, one mouth, two ears, one body, two arms, two hands, two sets of fingers, two legs, two feet, and one belly button for a total of 24 possible body parts. In order to count as one body, the figure had to have more than one line. Single straight lines were not counted as one body. Children were not asked to label the parts of their drawings. The researcher only counted those parts present that were obvious and did not need the child's interpretation. If only one of a pair of body parts were drawn, such as just one ear, the researcher counted the observed part as just one, and not two. Children were not given points for extra body parts drawn, such as a neck, because they were not part of the Mat Man activities.

Treatment of the Data

After the researcher tallied the data for each child's pre and post drawings, it was calculated and interpreted by the researcher. The researcher calculated the mean, mode, median, standard deviation and range for each data set by hand. The researcher then calculated a t test for nonindependent samples with the two sets of scores, determined the degrees of

freedom, and found the significance of the null hypothesis and hypothesis at .05, .01, .001.

Summary

The researcher conducted this study in a whole group setting with preschool aged children, and interpreted the drawings of these children without their input. The drawings were scored by the number of body parts drawn that were a part of the HWT Mat Man activities. Mat Man had a total of twenty-four body parts. If a child drew more than the specific twenty-four body parts Mat Man had they were not counted.

CHAPTER 4

Analysis of the Data

Introduction

The researcher compared pre and post draw-a-person drawings from thirty-one preschool children that were introduced to the HWT Mat Man activities for the first time.

Description of the Environment

The researcher had chosen to pilot the HWT curriculum with preschool students. Mat Man activities were part of the HWT curriculum and the researcher chose to use this activity with the preschool children as a pre and post assessment for the number of body parts drawn on a draw-a-person. Only those body parts taught in the Mat Man activities were counted in this study.

Hypothesis/Research Question

Preschool children who have been instructed in the HWT Mat Man activity will improve their fine motor skills as evidenced by the increased number of body parts present in their draw-a-person.

Null Hypothesis

Following instruction with the HWT Mat Man activity no significant impact is demonstrated by preschool children with regards to the number of body parts present in their draw-a-person. Significance was determined for $p \geq .05$, .01, and .001.

Results of the Study

Table 1 illustrated the number of body parts drawn by each of thirty-one students in both the pre and post Mat Man draw-a-person drawings. Table 1 also included the difference between the pre and post scores, as well as the sums and means for all of these groups. The standard deviation for both pre and post groups were calculated and included in Table 1.

Table 1

Number of Body Parts Drawn

Student	x	y	D	D squared
1	13	19	+6	36
2	0	3	+3	9
3	0	12	+12	144
4	11	16	+5	25
5	11	11	0	0
6	7	11	+4	16
7	0	2	+2	4
8	9	15	+6	36
9	11	11	0	0
10	9	12	+3	9
11	10	19	+9	81
12	9	22	+13	169
13	7	12	+5	25
14	9	20	+11	121
15	14	10	-4	16
16	7	14	+7	49
17	8	9	+1	1
18	13	20	+7	49
19	11	15	+4	16
20	8	10	+2	4
21	17	20	+3	9
22	6	6	0	0
23	9	22	+13	169
24	15	16	+1	1
25	14	16	+2	4
26	9	18	+9	81
27	12	20	+8	64
28	8	13	+5	25
29	9	12	+3	9
30	7	13	+6	36
31	4	6	+2	4
Sum	277	425	148	1212
Mean	8.935	13.709	4.774	

Standard Deviation x = 4.098 Standard Deviation y = 5.305

Table 2 disclosed the formula for a t-test for nonindependent samples and the researcher's hand calculated t-value of 6.476.

Table 2

$$t = \frac{D}{\sqrt{\frac{D - \frac{(D)}{N}}{N(N-1)}}}$$

$$t = \frac{148}{\sqrt{\frac{1212 - \frac{(148)}{31}}{31(31-1)}}}$$

$$t = \frac{4.774}{\sqrt{\frac{1212 - 706.581}{930}}}$$

$$t = \frac{4.774}{\sqrt{\frac{505.419}{930}}}$$

$$t = \frac{4.774}{\sqrt{.5435}}$$

$$t = \frac{4.774}{.7372}$$

$$t = 6.476$$

Table 3 displayed the statistical data for the pre and post Draw-a-Person drawings.

Table 3

Data Comparison of Pre and Post Draw-a-Person Drawings

Statistic	Value
No. of Pairs	31
Sum of D's	148

Mean of D's	4.774
Sum of D's Squared	1212
t-value	6.476
Degrees of Freedom	30

Table 4 represented the distribution of t with 30 degrees of freedom. The calculated value for t was 6.476 which was larger than the distribution of t with 30 degrees of freedom with significance determined at $p \geq .05$, .01, and .001 (Gay, Mill, & Airasian, 2006). The null hypothesis, which stated that that the Mat Man activities would have no significant impact on the number of body parts drawn, was rejected at all levels. The hypothesis stated that there would be an increased number of body parts drawn following the Mat Man activities. Significance was found, and the hypothesis was supported at the .05, .01, and .001 levels.

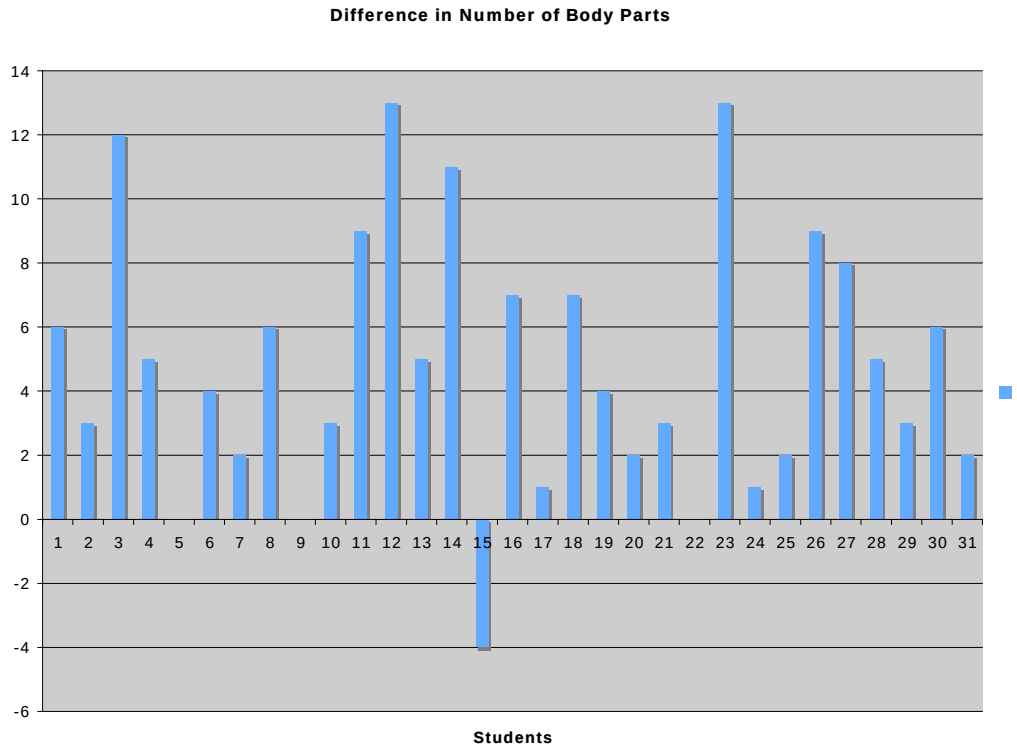
Table 4

Distribution of t

	p		
df	.05	.01	.001
30	2.042	2.750	3.646

Table 5 showed the difference in the number of body parts drawn between the pre and post draw-a-person drawings for each student in the study. Twenty-seven students drew more body parts on their post draw-a-person, three students drawings contained the same number of body parts pre and post, and one student had four fewer body parts on the post draw-a-person drawing.

Table 5



Findings

The null hypothesis was rejected and a significant impact on the number of body parts drawn on a draw-a-person following the HWT Mat Man activity was demonstrated in this study. The hypothesis that preschool children would draw more body parts on their draw-a-person following the Mat Man activities from HWT was supported. Of the thirty-one children who drew, twenty-seven of them increased the number of body parts drawn on the post drawing. Three children had the same

number of body parts on both pre and post drawings, and one child had fewer body parts on the post drawing.

Discussion

The samples the researcher was shown at the HWT curriculum training for pre and post draw-a-person drawings compared to the pre and post drawings of the preschool children in this study. The majority of the children in this study increased the number of body parts drawn following the Mat Man activities. The Mat Man activities were engaging for the children, provided a multi-sensory approach, and resulted in improved drawings for twenty-seven of the thirty-one children in this study.

Summary

As a result of the data the researcher concluded that the hypothesis was supported as evidenced by the t score for nonindependent samples of 6.476 with 30 degrees of freedom. Eighty-seven percent of the preschool children in this study increased the number of body parts drawn on their post draw-a-person following the Mat Man activities. The Mat Man activities of the HWT curriculum improved the majority of the children's draw-a-person.

CHAPTER 5

Summary, Conclusions and Recommendations

Introduction

The researcher had not had formal handwriting training before attendance at the Handwriting Without Tears workshop. The researcher sought out this training for improvement in handwriting instruction

within the researcher's preschool classroom. Draw-a-person was one element of the preschool fine motor assessment at the researcher's school district. The researcher was looking for instructional strategies with the goal of improved drawing and handwriting skills for preschool students. The researcher found that this study supported the hypothesis that the HWT Mat Man activities increased the number of body parts drawn by preschool children on a draw-a-person assessment. Since drawing skills were developed before writing skills the researcher speculated that improved drawing skills were directly relate to improved handwriting skills.

Summary

The learning theories discussed by the researcher included information on child development and learning styles. The Mat Man activities from the HWT curriculum were suited to a variety of learning styles and included hands-on manipulatives, music, and repetition. The importance of handwriting in schools and beyond for communication purposes was apparent. The researcher understood that drawing developed in young child before

writing, and chose to research preschool children's drawing abilities. The variety of ability levels within the preschool convenience sample used could be generalized to the preschool aged population in the researcher's school district.

Conclusions

The Mat Man activities from the HWT curriculum increased the number of body parts drawn on a draw-a-person completed by most preschool children. Children were actively engaged in learning new concepts when presented with the novel, hands-on approach of the Mat Man activities. Repetition was required to teach young children new concepts, and the Mat Man activities included repetition through a variety of ways.

Recommendations

The researcher would recommend using the Mat Man activities with both whole group and small group settings. Children who are unable to draw basic forms may need additional instruction and practice before attempting to draw-a-person. Novel activities such as Mat Man improve both instruction and children's knowledge. Children who can draw-a-person with twenty or more body parts should be introduced to letter writing using the HWT curriculum.

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