University of California Los Angeles

Los Angeles, California.

TOUCHMATH Intervention
VS
Traditional Intervention:

Is there a Difference?

Presented by

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CHAPTER I

INTRODUCTION

Hypothesis

It is hypothesized that special education students, who are taught the Touch Math program, will show greater improvement in basic math skills than their counterparts who are instructed using a traditional textbook approach.

Project Overview

Current research has shown that teachers who use a multisensory approach to instruct students are more successful in the classroom. I tested this assertion by using a program called Touch Math.

At the beginning of the school year, two math groups were formed. Each was comprised of 10 students in the 4th or 5th grade. All students were enrolled in a Special Education Resource Specialist Program.

Adding and subtracting with and without regrouping were the targeted math skills. First, a pretest was given to students from each group to determine their level of proficiency and to establish a baseline before instruction commenced. Seventeen problems were included in the pretest. Each student was timed. The number of minutes needed to complete the test was recorded along with the number of correct answers.

Next, differentiated math instruction was given. Group I was taught how to add and subtract using Touch Math. Group II was taught these same skills using a traditional math curriculum. Each group received 45 minutes of instruction on Monday, Wednesday, and Friday. I instructed both groups with the help of a bilingual aide. This teaching arrangement continued for approximately 10 weeks.

After instruction was completed, a posttest was given to these students. This test was identical to the pretest. Once again, the number of correct responses and elapsed time was recorded. The data from the pretest and posttest was compared and analyzed to see if the multisensory approach was more effective than the traditional approach in teaching basic math skills. A determination was then made to see if these results corresponded to the research.

CHAPTER II

METHODOLOGY

Participants

The participants of this Action Research Project included special education students from XXXXXX Elementary School in the Los Angeles Unified School District. They were chosen from a sample of 4th and 5th grade students with special needs who had been designated as learning disabled. The students ranged in age from 9 to 12 years old.

XXXXXXX School had an enrollment of 1642 students – kindergarten through 5th grade. Approximately 83% were English Language Learners with Spanish being their primary language. These students came from low-income families, most of which lived in subsidized housing. In fact, because income levels were so low, the federal government had designated XXXXXXXXX as a Title I school. Among other things, this entitled the students to receive funding for free meals and other special programs designed to assist this population.

When this research project was conducted, XXXXXXXXX Elementary School had 123 students who qualified for special educational services. From this group, 57 students had been diagnosed as having a specific learning disability. Of these, 28 (18 boys and 10 girls) were 4th and 5th graders placed in a resource specialist program.

A pretest (see Appendix B) consisting of 17 problems was given to these 28 students to determine which ones had difficulty adding and subtracting with and without regrouping. Pencils and scratch paper were given to each student. No charts, manipulatives, or calculators were allowed. The test was timed.

When students finished the pretest, the amount of time it took them to complete it was recorded on their test booklet. The pretest was then scored. After evaluating the results, it was determined that 20 students (13 boys and 7 girls) had not mastered basic addition and subtraction procedures. These students were perfect candidates for this Action Research Project. The remaining 8 students would not be involved in this project since they were already proficient in this area.

The 20 participants were randomly divided into two groups. Each group was comprised of 10 students. Group I had 7 boys and 3 girls. Group II had 6 boys and 4 girls. Group I was taught the Touch Math program. Group II was instructed using traditional math curriculum. The posttest results of these two groups would either support or disprove the above-mentioned hypothesis.

Procedures

Instruction for both groups lasted 10 weeks. Students met Monday, Wednesday, and Friday for 45 minutes. Tuesday and Thursday was used to support grade level curriculum and to review what was taught in the general education classroom. Classes began at 9:00 am. During the first 10-week period, the principles of Touch Math were taught to Group I.

Innovative Learning Concepts, Inc published the Touch Math curriculum. It has been used for over 25 years. The curriculum included an easy to understand teacher's guide, an instruction video, colorful posters, and a variety of worksheets. There were different kits for primary and upper grades. For purposes of this Action Research Project, the upper grade curriculum was used.

The first step was to teach the students touch points for each number (Appendix A). Single touch points are touched and counted one time (numbers 1-5) and double touch points (numbers 6-9) are touched and counted twice. Each student was given their own reference strip in case they needed to review this material. Also, a large, colorful poster of all touch points was prominently displayed in the classroom. As recommended in the Touch Math instruction manual, I made certain that each student knew where the touch points were located on every number with 100% accuracy before moving to the next step.

Teaching Group I how to add single and double digits without regrouping came next. It began by teaching students how to count the touch points on each number. Once this procedure was understood, addition with continuance counting was introduced. For example, if the problem was 6 + 3, I would say, "Touch the largest number, say its name and continue counting." Worksheets were used to test for understanding (Appendix C). At about the 4th week, addition with regrouping was presented to the class. All the students seemed to grasp this concept. Informal testing indicated that the class was ready to move on to subtraction.

Before introducing problem solving in subtraction, the students practiced counting backward orally from 18 and from every number below. They had to be able to stop at numbers other than zero, i.e., they needed to count backward from 17 to 5, 14 to 3, 16 to 9, etc. A number line was given to the students to help them practice this skill.

The first lesson in subtraction began with the problem 7 – 4: "Touch the first number, say its name, and count backward. Say seven, then count backward while touching the touch points on the second number – six, five, four, three." To reinforce this math fact, they would say aloud 7 minus 4 equals 3. Next, a systemic approach to teaching subtraction with regrouping was successfully presented. After 10 weeks of instruction, Group I was given a posttest to determine if progress had been made. That data were analyzed in the next chapter.

Group II began instruction the following week. Once again, 10 students were taught basic addition and subtraction procedures. Instead of using the multisensory Touch Math program, district math textbooks were used. The curriculum was called *Math Steps,* which relied on conventional methods that have been used by most elementary school districts. Memorizing math facts was the key to this traditional approach.

During the course of instruction various tools were introduced to supplement the textbook. Flash cards, worksheets, games, music, and manipulatives were all used at one time or another. Using the textbook alone would have been disastrous since the "drill and kill" method did not work when it was tried in previous years. Therefore, it can be said, that Group II also experienced a type of multisensory math instruction. As a rule,

students with special needs require reinforcement from different avenues. That is why these devices were used to supplement traditional textbook instruction.

After 10 weeks, Group II had been taught the same math procedures as Group I. The approach was different, but the material covered was identical. The posttest was administered to this group shortly after instruction was completed. The students seemed to be more confident as they took the test a second time. Unfortunately, there were some students who still relied on finger counting and tally marks to help them solve simple addition and subtraction problems. The specific results of this posttest were thoroughly analyzed in the next chapter.

CHAPTER III

RESULTS

Introduction

Group I consisted of 10 special education students (7 boys, 3 girls) who were below grade level in math. The Touch Math program was the only curriculum used with this group. The 10 students in Group II (6 boys, 4 girls) were also struggling in this area. Standard textbook curriculum was taught to this second group, supplemented with various multisensory components. Classes were held for 45 minutes on Monday, Wednesday, and Friday. A pretest was given to all students before instruction began. At the end of 10 weeks, a posttest was administered to both groups. What follows is an analysis of that test data.

Group I

Chart A summarizes the data from Group I. Examining the pretest first, there was a range from a low of 8/17 correct (47%) to a high of 15/17 correct (88%). Regarding the time it took to complete the pretest, the range was from 150 seconds to 495 seconds. The average number of correct answers was 11/17 (68%) and the average time it took to complete the test was 323 seconds.

The posttest results for Group I showed definite improvement in both accuracy and time. The correct answers ranged from 11/17 (65%) to 16/17 (94%) correct answers with an average score of 14/17 (82%). The amount of time it took to complete the posttest ranged from 125 seconds to 340 seconds. The average time was 240 seconds.

GROUP I - TOUCH MATH

	PRETEST			POSTTEST			Improvement	
Student	Problems Correct/17	%	Time (sec)	Problems Correct/17	%	Time (sec)	Accuracy	Time
1	14	82%	150	15	88%	125	7%	17%
2	15	88%	306	15	88%	190	0%	38%
3	8	47%	454	11	65%	340	38%	25%
4	11	65%	340	14	82%	250	27%	26%
5	14	82%	495	14	82%	325	0%	34%
6	12	71%	244	15	88%	282	25%	-16%
7	10	59%	375	13	76%	312	30%	17%
8	12	71%	366	13	76%	213	8%	42%
9	10	59%	195	16	94%	220	60%	-13%
10	9	53%	303	13	76%	140	44%	54%
Average	**12**	**68%**	**323**	**14**	**82%**	**240**	**24%**	**22%**

Chart A

GROUP I - TOUCH MATH

	PRETEST			POSTTEST			Improvement	
Student	Problems Correct/17	%	Time (sec)	Problems Correct/17	%	Time (sec)	Accuracy	Time
1	14	82%	150	15	88%	125	7%	17%
2	15	88%	306	15	88%	190	0%	38%
3	8	47%	454	11	65%	340	38%	25%
4	11	65%	340	14	82%	250	27%	26%
5	14	82%	495	14	82%	325	0%	34%
6	12	71%	244	15	88%	282	25%	-16%
7	10	59%	375	13	76%	312	30%	17%
8	12	71%	366	13	76%	213	8%	42%
9	10	59%	195	16	94%	220	60%	-13%
10	9	53%	303	13	76%	140	44%	54%
Average	**12**	**68%**	**323**	**14**	**82%**	**240**	**24%**	**22%**

Chart A

GROUP II - TRADITIONAL

	PRETEST			POSTTEST			Improvement	
Student	Problems Correct/17	%	Time (sec)	Problems Correct/17	%	Time (sec)	Accuracy	Time
1	10	59%	247	12	71%	230	20%	7%
2	13	76%	305	13	76%	295	0%	3%
3	16	94%	443	15	88%	420	-6%	5%
4	11	65%	340	13	76%	330	18%	3%
5	8	47%	193	12	71%	233	50%	-21%
6	12	71%	131	14	82%	122	17%	7%
7	12	71%	375	15	88%	395	25%	-5%
8	14	82%	465	14	82%	460	0%	1%
9	15	88%	385	17	100%	365	13%	5%
10	9	53%	198	8	47%	175	-11%	12%
Average	**12**	**71%**	**308**	**13**	**78%**	**303**	**13%**	**2%**

Chart B

may indicate that the student did not put forth his best effort and was not concerned with his score. Furthermore, 8 students from Group II finished the posttest in less time. However, this translated to an overall improvement of only 2%.

Data Summary

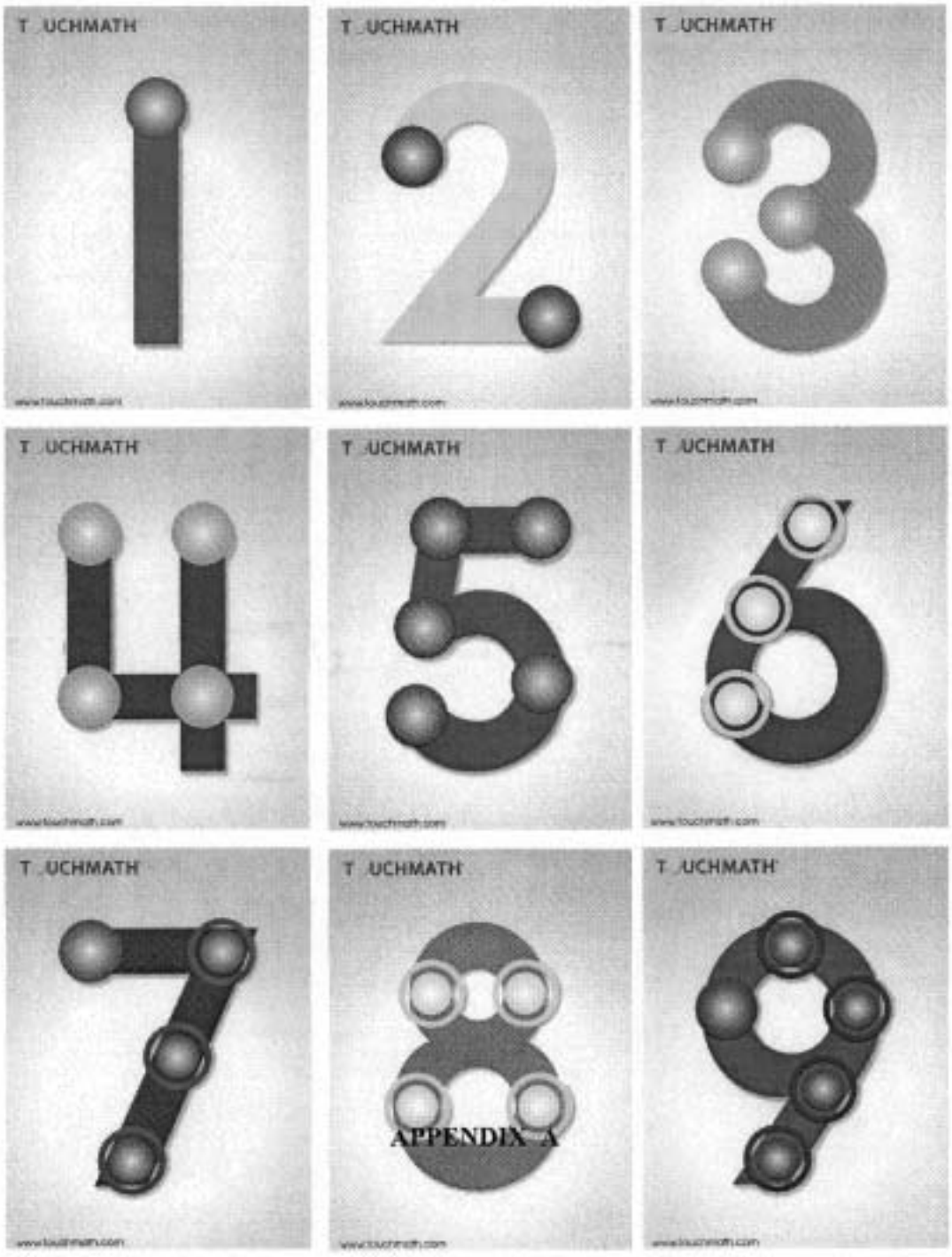
After 10 weeks of concentrated math instruction, both groups showed improvement. However, the final results for the Touch Math group were more impressive. For example, there was an overall improvement in accuracy and time of 24% and 23% respectively. On the other hand, Group II improved about 13% in accuracy and only 2% in the time category. Therefore, by the numbers alone, Touch Math was by far the more effective program.

In making a final evaluation, other factors must also be considered. First, most of the students in Group I exhibited a more confident demeanor after completing the Touch Math program. These were students with special needs who had previously been unsuccessful in school. They were now able to solve math problems quickly and accurately without counting on their fingers. They began to feel good about themselves because they were finally able to do something right. This was an unexpected benefit that became apparent during the course of instruction. Such was not the case with Group II. After 10 weeks, these students still counted on their fingers and continued to make careless mistakes.

The final results of this Action Research Project indicated that the Touch Math group was able to solve math problems faster and more accurately than their counterparts in Group II. In addition, the participants in Group I began to feel more confident in the

classroom. For many, this was the first time they had been successful in school and finally realized that they were capable of accomplishing a great deal more. In conclusion, the data indicated that Touch Math was an effective method of teaching students with mild learning disabilities. Furthermore, this Action Research Project substantiated the hypothesis set forth in Chapter I.

APPENDIX A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APPENDIX A

APPENDIX B

1)
$$\begin{array}{r} 8 \\ +1 \\ \hline \end{array}$$

2)
$$\begin{array}{r} 5 \\ +3 \\ \hline \end{array}$$

3)
$$\begin{array}{r} 9 \\ -4 \\ \hline \end{array}$$

4)
$$\begin{array}{r} 6 \\ -3 \\ \hline \end{array}$$

5)
$$\begin{array}{r} 7 \\ +5 \\ \hline \end{array}$$

6)
$$\begin{array}{r} 9 \\ +8 \\ \hline \end{array}$$

7)
$$\begin{array}{r} 12 \\ -5 \\ \hline \end{array}$$

8)
$$\begin{array}{r} 15 \\ -7 \\ \hline \end{array}$$

9)
$$\begin{array}{r} 12 \\ +24 \\ \hline \end{array}$$

10)
$$\begin{array}{r} 35 \\ +42 \\ \hline \end{array}$$

11)
$$\begin{array}{r} 65 \\ -43 \\ \hline \end{array}$$

12)
$$\begin{array}{r} 87 \\ -64 \\ \hline \end{array}$$

13)
$$\begin{array}{r} 78 \\ +57 \\ \hline \end{array}$$

14)
$$\begin{array}{r} 96 \\ +85 \\ \hline \end{array}$$

15)
$$\begin{array}{r} 87 \\ -69 \\ \hline \end{array}$$

16)
$$\begin{array}{r} 73 \\ -48 \\ \hline \end{array}$$

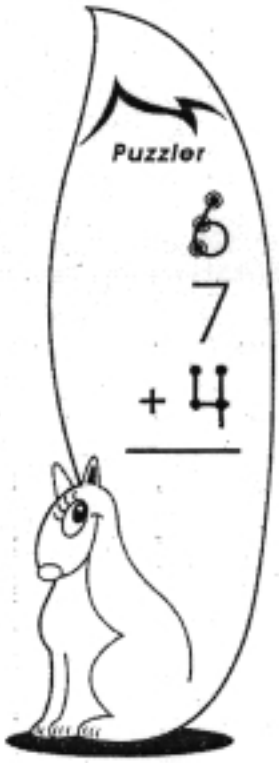
17)
$$\begin{array}{r} 78 \\ 49 \\ 65 \\ +23 \\ \hline \end{array}$$

NAME: _____
DATE: _____
TIME: _____

APPENDIX B

Name _____

9 − 5 =	4 − 2 =	10 − 3 =	5 − 0 =
6 − 4 =	13 − 5 =	8 − 5 =	
12 − 5 =	11 − 3 =	3 − 2 =	

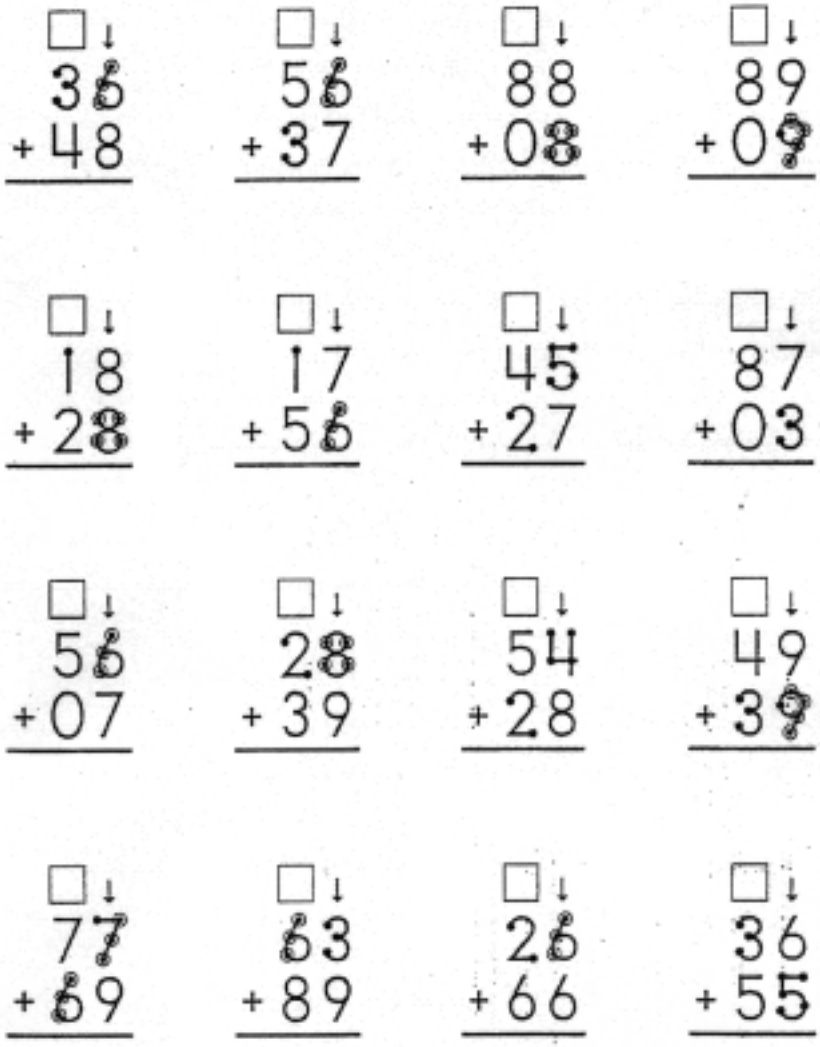


APPENDIX C

25 -14	48 -37	55 -22	68 -42
56 -25	95 -34	84 -73	73 -31
69 -55	57 -43	48 -35	36 -24
77 -33	67 -42	88 -14	98 -68

APPENDIX C

APPENDIX C



APPENDIX C