



CONCORDIA  
UNIVERSITY  
PORTLAND • OREGON

# The Effectiveness of Using TouchMath Addition Techniques with Students with Learning Disabilities

Sharon H. Bergman  
*Concordia University, Portland*



**TOUCHMATH®**

The Effectiveness of Using TouchMath Addition Techniques with Students with Learning  
Disabilities

Sharon H. Bergman

Concordia University Portland

An Action Research Report Presented to  
The Graduate Program in Partial Fulfillment of the Requirements  
For the Degree of Masters in Education

Concordia University-Portland  
2014

## **The Effectiveness of Using TouchMath Addition Techniques with Students with Learning Disabilities**

This literature review was completed to determine the research that has been done on the usefulness of TouchMath as a strategy for solving addition problems for students who have Individual Education Plans (IEP's). According to the National Center for Learning Disabilities (NCLB), students with special needs often have problems with memory and therefore find it difficult to remember math facts and keep a sequence of steps in order. These students are sometimes referred to as having dyscalculia. They require specialized instruction and alternate or modified content in order to be successful in the general education classroom. Acquisition of math facts needs to be approached in different ways. When basic math facts are not mastered early on, students who have dyscalculia may have difficulty understanding more advanced math applications.

With the introduction of the Common Core State Standards (CCSS), it is now more important than ever that students acquire the ability to perform math calculations. "The Common Core defines the knowledge and skills that students from pre-kindergarten to 12<sup>th</sup> grade need to master each year to be prepared for the next grade and ultimately college or work" (inside schools.org, 2014). With that in mind, this research paper seeks to answer the question: Will students with IEP's who are taught TouchMath addition strategies in the resource room perform better on assessments using TouchMath as opposed to using the traditional addition techniques taught in the general education classroom? The hypothesis is that the students will have higher scores on math assessments when they use the TouchMath technique for solving addition problems.

## **Review of Literature**

An elementary school teacher named Janet Bullock developed the TouchMath Program in 1975. She was concerned because many of her students were having difficulty with math concepts (TouchMath.com, 2014). She decided that a new method needed to be taught so that her student's skills, math facts and confidence in mathematics could improve. Her method was to place counting points on numbers in order to teach that a symbol represents a quantity. Her students had a lot of success with the method and she discovered a way of transitioning them from concrete to symbolic learning. In the TouchMath system, each numeral from one to nine has dots on it. These dots are visual reminders for students to count in order to accurately solve a math problem. Part of the program involves memorizing the location and amount of the touch points on each number, remembering the multiples of numbers (for multiplication) and counting backwards (for subtraction). The goal of the program is for the student to eventually internalize the points so that they are no longer needed in order to solve math problems.

The program is based on a report released by Kramer and Krug (1973). In this method of solving mathematical problems, dots were placed on numerals in a pattern modeled off of dice and dominoes. Kramer and Krug (1973) felt the TouchMath system might be helpful for teaching computation to children with special needs. Scott (1993) continued the research and conducted a study to examine using a multisensory program to instruct students with mild disabilities in addition and subtraction concepts. TouchMath was chosen for the study because it was not based on memorization of facts but was a technique for acquiring the facts (Scott, 1993). Scott taught three elementary students with mild disabilities how to do double digit addition with regrouping and double and triple subtraction with regrouping. Her results were that the students

made significant progress in the targeted skill. The students were able to maintain their knowledge and were able to generalize their knowledge to other mathematical situations. She generalized that the results showed that TouchMath was a useful method for special education students as well as general education students because the students in the general education classroom also showed interest in learning the technique.

In 2001 a study was conducted which focused on using creative memorization strategies to improve math achievement (Bielsker, Napoli, Sandino & Waishwell, 2001).

First and second graders were chosen because they were having difficulty memorizing math facts. Three interventions were used; TouchMath, multiple intelligences and mnemonics to increase the amount and quality of retention. The study indicated that students increased their ability to remember math facts and decreased their need to use manipulatives in order to solve math equations. TouchMath was successful for the lower achieving students but the higher achieving students did not need the dot strategy to help them remember math facts (Bielsker, et al., 2001).

In 2002, Wisniewski and Smith conducted a study with four third and fourth grade students with intellectual disabilities, students with learning disabilities and students with other health impairments. The students received TouchMath instruction for 20 minutes a day for fourteen weeks in the resource room. They were tested weekly on math Mad Minute addition tests. Based on a pre and posttest, all of the students improved their accuracy and speed of solving addition facts. In another study, eleven first graders who were at-risk for academic difficulties were given TouchMath instruction as an intervention. They were also given instruction in reading using the Orton Gillingham program, a multi-sensory approach to reading instruction (Orton, 1966; Sheffield, 1991). All eleven of the students were at the pre-first grade

level for reading and spelling. Seven of the students were at a pre-first grade level in mathematics and the other four were at the early first grade level. They were instructed in reading phonics for 25-55 minutes a day and also in TouchMath for 25-55 minutes a day while they attended first grade. They continued to use both methods for instruction in the second grade. However, they did not require reteaching of TouchMath because none of the students needed the additional instruction in order to accurately use it. After two years of the intervention, the students were no longer considered at risk for special education services (Dev, Doyle, & Valente, 2002).

Students with Learning Disabilities in math were taught three row double-digit addition problems using TouchMath (Hanrahan & Simon, 2004). Before the intervention the students were solving math problems using a count-all and count on strategy. In a count all strategy students rely on touching and counting every object in order to accurately solve a simple addition or subtraction problem. In a count on strategy, students start from the highest number and count on the amount that needs to be added. These students also heavily relied on using their fingers for counting. The results were that some of the students were able to learn the TouchMath strategy, apply it and remember it for up to four months after they were instructed in the method.

Elementary students with Autism were taught single-digit addition problem solving skills using a number line and TouchPoint strategies (Cihak & Foust, 2008). Prior to the study the students could not correctly calculate single-digit addition problems. The results were that the touch-point strategy was more effective. This study was extended to three middle school students with Autism and moderate intellectual disabilities. They were taught how to solve single-digit mathematics problems using a number line (Boon, Cihak, & Fletcher, 2010). The results

indicated that the TouchMath strategy was more effective and efficient in teaching students single digit addition problems.

In 2008, a study by Mays included two classes of second grade students. Of the forty-students, nine of them had IEP's. The two classes were instructed for six weeks in TouchMath addition strategy instead of their regular math curriculum. As a pretest the students were given twenty single digit addition math problems and timed for one minute to see how many problems they could solve. Then they were instructed in the TouchMath strategy for several weeks and given daily practice. The results were that the use of Touch Math increased computation skills and promoted a strategy that the students could use independently. Seventeen of the thirty-four students showed 100% improvement in their scores. The students showed increased motivation for math and they felt the addition strategy was an easier method for them than the traditional addition method (Mays, 2008).

“Three second graders with mild intellectual disabilities who were in an inclusive classroom were instructed in addition skills using TouchMath in order to investigate the effectiveness, generalizability and the permanency of the instruction” (Calik & Kargin, 2010). The results showed that TouchMath instruction based on direct instruction is effective in teaching basic addition skills. The study also demonstrated that all the teachers had positive feelings toward the program and they stated that they would use the program in their classroom.

The effects of teaching high schoolers with mild intellectual disabilities money problems that involved three digits with regrouping was studied (Boon & Water, 2011). The students received instruction in a self-contained classroom. The results showed that the TouchMath program improved all three of the student's ability to subtract three digit numbers involving money. However, once the intervention was discontinued, some of the students had difficulty

maintaining the skills. Three students with Physical Disabilities (Spina Bifida, Cerebral Palsy and Stroke) were instructed using TouchMath in basic computational skills of problems with sums up to 20. All students were successful in the skill and were able to generalize and maintain the strategies they were taught (Avant, Thompson, & Wolff, 2011).

The ability to add quicker and more accurately was studied in 2013 by Ullrich. A third grade classroom of twenty-four students was instructed in TouchMath for eight weeks, thirty minutes a day, for four days a week. Half of the students had scored below the fiftieth percentile in the Measure of Academic Progress Test. These students were administered pretests, posttests, daily and weekly testing and timed tests to track their progress using TouchMath. The results were that TouchMath increased their math fluency regardless of gender, first language spoken or school attendance. They also increased their positive attitude towards math and they felt that the use of the TouchPoints was the key strategy that increased their scores (Ullrich, 2013). The author recommended “Mathematics instruction incorporating the TouchMath program be implemented in lower elementary classes because using the TouchPoints on numerals bridges the gap between concrete experiences and abstract concepts” (Ullrich, 2013).

### **Analysis**

The literature review has examined the research of the effectiveness of using TouchMath strategies with students with disabilities. The review of these works has improved this researchers understanding of the positive impact that TouchMath can have on the success of students who have difficulty with math because of their disabilities. The review of these studies has enlightened the researcher on the topic and will help in designing the research.

The analysis of the literature showed that using TouchMath can be an effective tool for students with disabilities whether they are elementary students with mild disabilities (Scott,



1993), kindergarten students with memory issues (Bielsker, et al, 2001), third and fourth graders with intellectual disabilities, learning disabilities or other health impairments (Wisniewski & Smith, 2002), (Calik & Kargin, 2010), high school students with mild intellectual disabilities (Boon & Water, 2011), first graders at risk for learning disabilities (Dev, Doyle & Valente, 2002), elementary students with Autism (Cihak and Foust, 2008), middle school students with Autism (Boon, Cihak, & Fletcher, 2010) and twenty four third grade students in which half of the students were below the fiftieth percentile in the Measures of Academic Progress Test (Ullrich, 2013). All the studies shared the same theme that students with all types of disabilities who have difficulty remembering math facts have more success with the TouchMath strategy than they do with traditional methods of solving addition problems. It was even noted that those students with no learning disabilities had success using TouchMath.

### **Conclusion**

Based on the success of the research studies that have been previously conducted using TouchMath, it is concluded that this researchers study will have similar positive results. The mere fact that TouchMath is a multi-sensory technique for solving math problems makes it an excellent tool to be used with students with learning disabilities. Often these students need to stimulate their senses and they have a particular sense that is strength for them. TouchMath makes use of the sense of touch and is called a tactile method. By implementing the multi-sensory strategy of TouchMath in the resource room with students who have IEP's, it is hypothesized that they will perform better on assessments using that tool as opposed to using the traditional addition techniques that are taught in the general education classroom.

### References

- Avant, M. T., & Heller, K. W. (2011). Examining the effectiveness of TouchMath with students with physical disabilities, *Remedial and Special Education*, [Abstract]. *Remedial & Special Education*, 32(4), 309.
- Bielsker, S., Napoli, L., Sandino, M., & Waishwell, L. (2001). ERIC - Effects of direct teaching using creative memorization strategies to improve math achievement. Retrieved from <http://eric.ed.gov/?id=ED460855>.
- Boon, R. T., Cihak, D. F., & Fletcher, D. (2010). Effects of the TouchMath program compared to a number line strategy to teach addition facts to middle school students with moderate intellectual disabilities. *Division on Autism and Developmental Disabilities Effects of the TOUCHMATH Program Compared to a*, 45, 449-458.
- Calik, N. C., & Kargin, T. ERIC - Effectiveness of the TouchMath technique in teaching addition skills to students with intellectual disabilities, *International Journal of Special Education*, 2010. Retrieved from <http://eric.ed.gov/?id=EJ890578>.
- Dev, P. C., Doyle, B. A., & Valente, B. (n.d.). *Labels needn't stick: "at risk" first graders rescued with appropriate intervention* (Unpublished master's thesis). Nazareth College of Rochester, Rochester, New York.
- Hanrahan, J. & Simon, R. An evaluation of the TouchMath method for teaching addition to students with learning disabilities in mathematics, *European Journal of Special Needs Education*, 2004-June. Retrieved from <http://eric.ed.gov/?id=EJ681567>.
- Hanrahan, J., An analysis of an imprinted-dot approach to teaching arithmetic to intellectually disabled children and its potential for facilitating inclusion - ISEC 2000. Retrieved from

(n.d.)[http://www.isec2000.org.uk/abstracts/papers\\_h/hanrahan\\_1.htm](http://www.isec2000.org.uk/abstracts/papers_h/hanrahan_1.htm).

Mays, D. (2008). *TouchMath: An intervention that works* (Unpublished master's thesis). Asbury College, Wilmore, Kentucky.

Multisensory Teaching Ideas and Materials for LD Students. (n.d.). Retrieved from <http://learningdisabilities.about.com/od/instructionalmaterials/p/multisensory.htm>.

Scott, K. S. (1993), Multisensory mathematics for children with mild disabilities. *Exceptionality: A Research Journal*. Retrieved from <http://eric.ed.gov/?id=EJ468855>.

Sheffield, B. B. (1991). The structured flexibility of Orton-Gillingham. *Annals of Dyslexia*, 41, 41-54.

Smith, D., & Wisniewski, Z. G. (2002). ERIC - How effective Is TouchMath for improving students with special needs academic achievement on math addition mad minute timed tests? Retrieved from <http://eric.ed.gov/?id=ED469445>.

Strand, L., (n.d.). *The TouchMath program and its effect on the performance of first graders* (Unpublished master's thesis). Bowling Green State University, Bowling Green, Ohio.

TouchMath, the Leading Multisensory Teaching Approach that Bridges Manipulation & Memorization. (n.d.). Retrieved from <http://www.touchmath.com/index.cfm?fuseaction=about.story>.

Ullrich, C. (2013). *The effects of mathematics instruction incorporating the TouchMath Program on addition computational fluency in a third grade classroom* (Unpublished doctoral dissertation). University of Arkansas, Fayetteville, Arkansas.

What Is Dyscalculia? | Mathematics Disability. (n.d.). Retrieved from <http://nclld.org/types-learning-disabilities/dyscalculia/what-is-dyscalculia>.

What is the Common Core? (n.d.). Retrieved from <http://insideschools.org/blog/item/1000161-what%E2%80%99s-the-common-core>.

## CAPSTONE PROJECT DOCUMENTATION FORM

Action Research is an exciting, disciplined process of discovery designed to integrate theory into one's daily practice in a way that improves educational practices *and* the individual conducting the research. Action Research is the Capstone Project in the Master's of Education program for Concordia University online. It gives the educator, as a scholarly practitioner, the opportunity to examine relevant issues in his or her own classroom or school which may complicate, compromise, or complement the learning process—and to find meaningful, practical, research-based answers.

In Action Research, teachers are empowered to design a research-based plan, identify learning issues or problems, review relevant literature that examines identified problems, implement specific, research-based strategies, and discover convincing evidence that supports or contravenes their teaching strategies. The most exciting part of Action Research is the teacher can often observe student improvement during the project and can demonstrate, in a quantitative manner, the improvement of student learning. Sagor notes, "Seeing students grow is probably the greatest joy educators can experience" (2002, p. 5).

The steps to the Capstone Project are detailed below. Read through all of the steps before creating your implementation plan. **Save this form as a draft until all Action Research steps have been completed and all responses are documented. You will submit this form at different stages of completion throughout EDU 698.**

<b>ACTION RESEARCH PROJECT</b>	
<b>Name:</b>	Sharon Bergman
<b>Title of Project:</b>	The Effectiveness of Using TouchMath Addition Techniques with Students with Learning Disabilities
<b>Date Completed:</b>	10/03/14
<b>IMPLEMENTATION TIME FRAME:</b>	
<b>Number of weeks:</b>	2
<b>TIMELINE of ACTION RESEARCH PROJECT:</b>	
<b>Start Date:</b>	9/15/14

<b>End Date:</b>	9/26/14
------------------	---------

**AREA OF FOCUS: What is your chosen area of focus? Why did you choose this area? How does it directly impact you?**

The main goal of this action research plan is to determine if students with learning disabilities who have IEP's perform addition problems more accurately using Touch Math as opposed to the traditional method for solving addition problems. The chosen area of focus is math and specifically TouchMath because it is used on a daily basis with special education students who have math goals and they seem to excel when using it. The intent of the research is to compare the student's scores on an assessment using the traditional method of addition as opposed to using TouchMath. When the special education students use TouchMath they genuinely seem excited because for the first time they feel successful with the ability to solve problems correctly that they previously were not able to solve. Since it is a new year and there are new students who are unfamiliar with TouchMath, this researcher wants to look at their experience with using TouchMath and see if they are able to achieve the same positive results that previous students had achieved. The topic is narrow enough to collect data and see improvement in the time frame allotted. The research will begin with a pre-assessment using traditional math on Day 1, followed by instruction using TouchMath on Day 2 & 3, and practice on days 4, 5, 6, 7, 8 and 9. On Day 10 a post-assessment will be conducted. This should be an adequate amount of time to achieve valid results.

**RESEARCH QUESTION:**

Will students with IEP's who are taught TouchMath addition strategies in the resource room perform better on assessments using TouchMath as opposed to using the traditional addition techniques taught in the general education classroom?

## DEMOGRAPHICS

**DEMOGRAPHIC DATA: Where/What is the research site? Who is directly involved? What statistics will give a clear understanding of the context and culture of the research site? (Do not use name as an identifier.) Provide references for sources used.**

This will be an action research plan that is quantitative in nature in order to answer the question: Will students with IEP's who are taught TouchMath addition strategies in the resource room perform better on assessments using TouchMath as opposed to using the traditional addition techniques taught in the general education classroom? The research will also aim to answer the question: Will students with learning disabilities feel better about math if they have an alternative method for solving addition problems?

The demographic data is elementary school children from the Stamford Public Schools in Stamford, Connecticut. These students will be from an ethnically and culturally diverse school representing over forty languages and countries of origin. The school has a large bilingual program for Spanish speaking students and it is the home of the district's elementary Hearing Impaired Program. The Stamford Public Schools is a large urban Title One public school system. The district comprises 16,000 students, 1,500 professionals and 20 schools, including six magnet and two International Baccalaureate schools. Stamford Public Schools has a total of twelve elementary schools, five middle schools, a pre-school center and three high schools.

**TARGET GROUP: Who are the students you are trying to impact? (Do not use names - you must use another identifier.) How do you think this strategy or content focus will benefit the target group?**

The students in the target group are students with disabilities who get their math support in the resource room but receive their regular math instruction in the general education classroom. The group is comprised of four third grade students who have Individual Education Plans for math and reading. They specifically have goals and objectives listed on their IEP for solving of addition problems with regrouping. The students are 8-9 years old. Three of the students are girls and one of the students is a boy. The boy (Student A) is Black and identified as a Student with Attention Deficit/Hyperactivity Disorder and is labeled as OHI (Other Health Impaired). One girl is Black (Student B) and identified as a student with learning disabilities. Another girl is Hispanic (Student C) and is identified as a student with learning disabilities. The other girl is white (Student D) and is identified as a student with Autism Spectrum Disorder. The benefit to these students with this research will be to offer an alternative method for them to solve addition problems with regrouping so they can be more successful on their assessments and feel better about their math ability.

**BASELINE DATA: What are the baseline data that support your choice for this area of focus? What patterns or trends do you see in the data? What is your proof that an issue exists in this focus area? (NOTE: You may not depend solely on Standardized Test Scores.)**

The baseline data is the scores that students with disabilities who have math goals and objectives on their IEP's receive when using traditional methods for solving addition problems. Students with disabilities often have difficulties with memory and cannot



remember math facts. When adding numbers together, they rely on their fingers or other manipulatives to help them solve the problems. TouchMath is another method for solving math problems without having to memorize facts. The students need to know how to count and how to count up from a number in order to be successful. The baseline data will be assessed by administering a pre-test using traditional addition techniques. Baseline data will also be established by using a pre-survey to see if student's attitude towards math changes after they have success using TouchMath.

### **ACTION PLAN**

**IMPLEMENTATION PLAN: What is your plan to implement the strategy or content knowledge? How did you collaborate with other staff involved with this issue?**

In this researcher's present position as a special education teacher, it has been observed that students with learning disabilities seem to be more successful using TouchMath rather than traditional methods of solving addition problems. Many teachers in the general education classrooms are not familiar with the TouchMath method for solving math problems so they are a bit skeptical of its use by students. This researcher met with the third grade teachers and explained what the goal of this action research was and the benefit of using this method for students with disabilities who have difficulties solving addition math problems with regrouping. After a careful review of literature, observation of former student's behavior when they learn TouchMath and student's success using this method, this researcher decided that an appropriate action research project would be to study student's scores using traditional addition solving strategies as opposed to Touch Math. An additional survey will be conducted to study the student's attitude towards math before they learn TouchMath and then after they learn TouchMath.

**PROCEDURES & MEASURES: What are the steps you will follow? How will you measure student progress?**

1. A survey about student's attitude concerning math will be given to four third grade students with learning disabilities who have mathematics goals and objectives in their IEP. The survey will probe the students about how they feel about math including if they think they are good at math, if they want to be good at math, if they think they are getting better at math and finally whether they think math is important or not.
2. The students will be given an assessment of twelve double-digit addition problems with regrouping.
3. They will then be instructed in the TouchMath program for addition for two days.
4. This will be followed by seven days of practice of addition problems using TouchMath. While this practice is occurring, the researcher will observe and take notes about the student's behavior when learning and practicing addition using TouchMath.
5. On the tenth day, the students will be given the same twelve problem assessment but this time with the addition of TouchMath TouchPoints on the numbers and a box above the second column to indicate the need for the regrouping.
6. They will also be given the same attitude survey that they filled out prior to the intervention.
7. Student progress will be measured by comparing the pre and post attitudinal surveys, pre and post addition assessments and observation of student

behavior.

**DATA COLLECTION: What data will be collected? How often? What tools will be used? Copies of tools will go in appendixes.**

The data will be scores from a researcher created math sheet of twelve problems of addition with regrouping and scores from the same math problems but the numbers will have TouchPoints and regrouping boxes. Additional data will be compared from the pre and post attitude survey administered about student's feelings towards math. These tools will be administered one time each as a pre and post assessment and survey. The tools used will be two attitude surveys for each student, one math sheet without TouchPoints, and one math sheet with TouchPoints.

**IMPLEMENTATION: (Describe the actual implementation of your plan.)**

**Week 1:**

Monday:

- Researcher met with the third grade teachers and explained what the goal of this action research was and the benefit of using this method for students with disabilities who have difficulties solving addition math problems with regrouping.
- Students were administered pre-attitudinal assessment regarding their feelings towards math and their performance on math tasks.
- Students were administered pre-test of twelve double-digit addition problems with regrouping.
- Teacher taught students TouchMath method of counting TouchPoints on numbers in order to solve addition problems with regrouping.

**Tuesday**

- Reviewed TouchMath method of using TouchPoints on numbers to solve addition problems with regrouping.
- Students made their own TouchMath chart by placing sticker dots on numbers 1-9.
- Students practiced solving addition problems with regrouping using TouchMath worksheets.

**Wednesday-Friday**

- Students practiced solving addition problems with regrouping using TouchMath worksheets.

**Week 2:****Monday-Wednesday:**

- o Students practiced solving addition problems with regrouping using TouchMath worksheets.

**Thursday:**

- Students had a day off from school for the Jewish holiday.

**Friday:**

- Students were administered post-attitudinal assessment regarding their feelings towards math and their performance on math tasks.
- Students were administered post-test of twelve double-digit addition problems with regrouping using the TouchMath method of solving addition problems.

**DOCUMENTATION OF ADJUSTMENTS: How did the plan change during the course of the Action Research timeline? What prompted the change? What were the effects of the changes?**

The action plan was administered according to the described plan with some necessary adaptations made as the plan was implemented. The first change was to have the students make their own TouchMath chart using circle stickers to indicate TouchPoints on numbers 1-9. While teaching the TouchMath method to the students, it became evident that they needed some further hands on instruction in order to fully understand the method. The tactile activity seemed to afford them the ability to further understand the method for adding numbers.

Another adaptation to the original action plan was the removal of one practice day. The research fell during the time when the schools were closed for the Jewish holiday. The students had one less day of practice using TouchMath than had originally been planned.

### **ANALYSIS & REPORTING**

**REPORTING RESULTS: What are your results and how will you share them? How does the baseline data compare to the ending data? What is the story told by your data?**

It was evident by the student's responses after administering the pre-attitudinal assessment of student's feelings towards math and their performance on math tasks that two of the four students did not like math, all of the students did not think they were good at math, all of the students wanted to be good at math, and all four of them did not think they were getting better at math. However, all students thought that math was important to learn. It was also indicated by the pre-assessment scores of addition problems with regrouping that the students were not having much success solving addition problems with regrouping using the traditional method taught in the general education classroom. During the instructional and practice phase, based on observation by the researcher of the student's facial expressions, body language, vocalizations and the disappearance of the use of student's need to use their fingers for counting, it was indicated that the student's attitude towards the use of the TouchMath strategy was favorable. Upon administration of the post-attitudinal survey, the results indicated that all four students now felt that they liked math, all four students

now thought they were good at math, all four still wanted to be good at math, and all four thought they were getting better at math. All four students still felt that math was important to learn. In the instructional and practice phase using TouchMath, all the students showed marked improvement in their ability to solve addition problems with regrouping based upon their correct answers achieved with teacher assistance. When administered the post-assessment using the TouchMath strategy for solving addition problems with regrouping, all student's scores improved. On the pre-assessment using the traditional method for solving addition problems with regrouping, Student A answered 7 out of 12 problems correctly. On the post-assessment using TouchMath for solving addition problems with regrouping he scored 11 out of 12 problems correctly. Student B scored 0 out of 12 correctly on the pre-assessment and 11 out of 12 correctly on the post-assessment. Student C scored 1 out of 12 correctly on the pre-assessment and 12 out of 12 correctly on the post-assessment. Student D scored 9 out of 12 correctly on the pre-assessment and 12 out of 12 correctly on the post-assessment. These results will be shared with the general education teachers in hopes that they will allow the students with learning disabilities who are in their class to use this method in order to be more successful with solving mathematical problems. This strategy may also be helpful for all students.

**IMPLICATIONS FOR FUTURE: How will the results impact your teaching in the future? How did the project inform your decision-making as a professional?**

The researcher plans to continue to use TouchMath for instructing her students in the solving of math problems. TouchMath is a valuable tool for solving all types of math problems. The program includes lessons for solving problems in addition, subtraction, multiplication, division and word problems. Based on the success of this study, this researcher will use the various strategies of TouchMath to instruct students based on their goals and objectives for math as outlined in their Individualized Education Plan (IEP). It would be interesting to conduct research in the same manner using the traditional method for solving addition problems with regrouping. If students were given a pre and post-assessment of math problems

using the traditional method, following six days of instruction and practice, it would be worthwhile to see if their scores improved as much as solving the same problems using TouchMath. Future research could also be conducted comparing the results of solving problems using TouchMath in the small group location of the resource room as compared to those scores using TouchMath in the general education classroom. Both studies would provide valuable information for future teaching instruction.

**CONCLUSIONS: Did this study improve student performance? Explain. Did this study improve your skills as a teacher? Explain.**

This research project sought to determine if students with IEP's who are taught TouchMath addition strategies in the resource room perform better on assessments using TouchMath as opposed to using the traditional addition techniques taught in the general education classroom. This study definitely improved student performance. The student's attitude towards math improved. All students in the study now like math when using TouchMath to solve addition problems with regrouping. They feel that they are good at math; they want to be good at math; they think they are getting better at math and they continue to believe that math is important to learn. This study was successful because through observation by the researcher of the student's behavior when using TouchMath, it was observed that the students genuinely seemed excited because they achieved success with the ability to solve problems correctly that they previously were not able to solve. The study seemed to improve student's self-esteem as well as their success in solving double-digit addition problems with regrouping. The positive results of this study validated this researcher's previous successful results of instructing former students with learning disabilities with TouchMath. This researcher will continue to instruct students using this method.

**REFERENCES:**

Home Page - The Stamford (CT) Public School System. (2014). Retrieved from <http://docs.stamfordpublicschools.org/>

**PERSONAL REFLECTIONS:**

The goal of this action research project was to determine if students with IEP's who are taught TouchMath addition strategies in the resource room perform better on assessments using TouchMath as opposed to using the traditional addition techniques taught in the general education classroom. Through previous experience instructing students using TouchMath, it was determined that students with learning disabilities seem excited when they have success with this method and that perhaps for the first time they achieve positive results when performing math calculations. It is believed that when students are successful with school related tasks, they are more cooperative when asked to perform work involving such tasks. It was a goal of this researcher to prove that TouchMath is a worthwhile method for student's with learning disabilities to use so that teachers in the general education classroom will be more cooperative and more amenable for those students to use it in their classroom. This research will be shared with those teachers and if they would like instruction in using it, that will be arranged. The positive results of this research project as well as the entire process leading up to the results was a very valuable experience for this researcher who had never conducted an action research project before. In order to maintain an effective, creative and flexible approach to education, a teacher must always be a student first taking advantage of all innovations made available by and for the profession. Implementing this research project has taught this researcher information not previously learned. It has helped to make this researcher a better teacher and will help to achieve more positive results in math for students who may not have thought they could achieve success.

**Math Survey**



Name \_\_\_\_\_ Pre-Student Attitude Survey towards Math

**Please circle the face that best describes how you feel.**

**Disagree      I don't know      Agree**

**1. I like math**



**2. I think I am good at math**



**3. I want to be good at math.**



**4. I think I am getting better at math**



**5. I think math is important to learn.**



**Math Survey**

Name \_\_\_\_\_ Post-Student Attitude Survey towards Math

**Please circle the face that best describes how you feel.**

**Disagree**

**I don't know**

**Agree**

**1. I like math**



**2. I think I am good at math**



**3. I want to be good at math.**



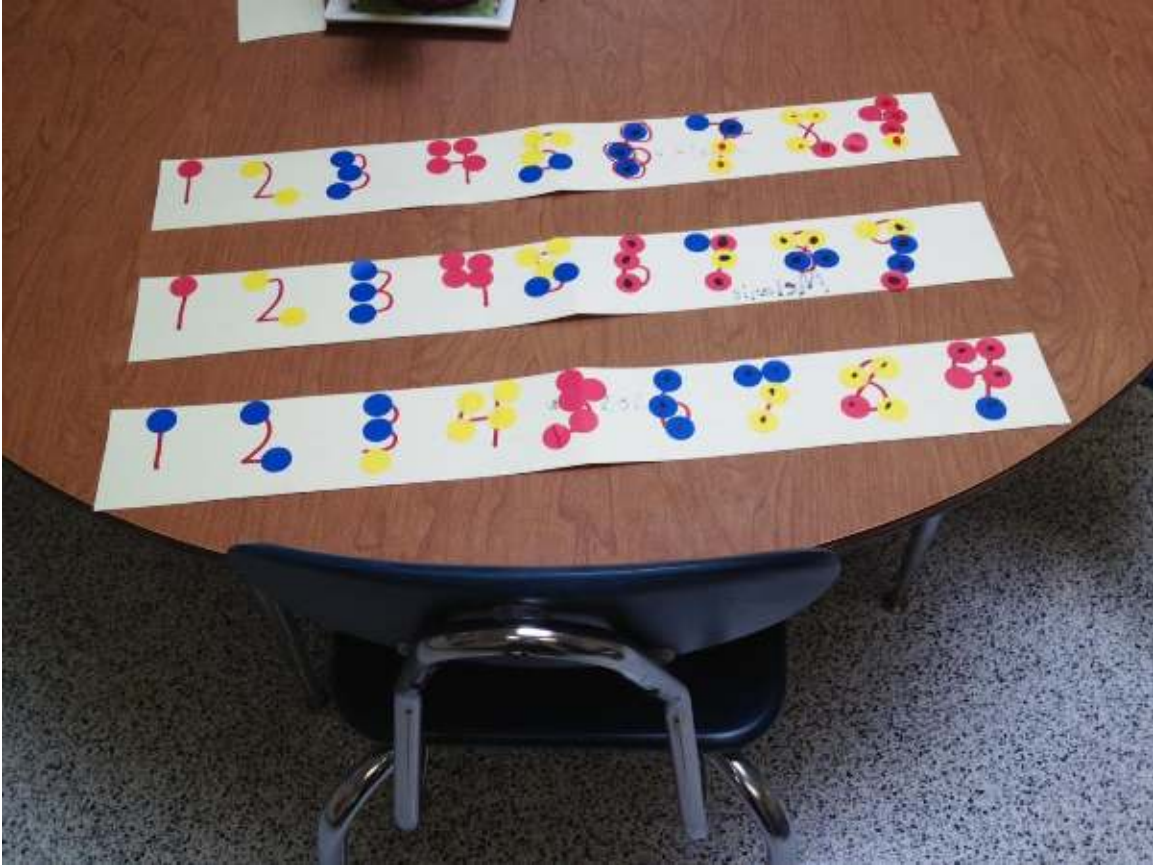
**4. I think I am getting better at math**



**5. I think math is important to learn.**







Name \_\_\_\_\_

Date \_\_\_\_\_

$$\begin{array}{r} 63 \\ +19 \\ \hline \end{array}$$

$$\begin{array}{r} 47 \\ +25 \\ \hline \end{array}$$

$$\begin{array}{r} 35 \\ +27 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ +37 \\ \hline \end{array}$$

$$\begin{array}{r} 59 \\ +12 \\ \hline \end{array}$$

$$\begin{array}{r} 28 \\ +34 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \\ +27 \\ \hline \end{array}$$

$$\begin{array}{r} 38 \\ +49 \\ \hline \end{array}$$

$$\begin{array}{r} 56 \\ +17 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ +37 \\ \hline \end{array}$$

Name \_\_\_\_\_

**Directions.** Add the numbers in the ones column. Write the number of tens in the box, then write the number of ones below the ones column. Add the numbers in the tens column, including the number in the box. Then write the answer.

Tens		Ones
□	↓	
6		3
+		19
-----		

Tens		Ones
□	↓	
4		7
+		25
-----		

Tens		Ones
□	↓	
3		5
+		27
-----		

Tens		Ones
□	↓	
1		3
+		37
-----		

Tens		Ones
□	↓	
5		9
+		12
-----		

Tens		Ones
□	↓	
2		8
+		34
-----		

Tens		Ones
□	↓	
1		7
+		27
-----		

Tens		Ones
□	↓	
3		8
+		49
-----		

Tens		Ones
□	↓	
5		6
+		17
-----		

Tens		Ones
□	↓	
2		4
+		37
-----		