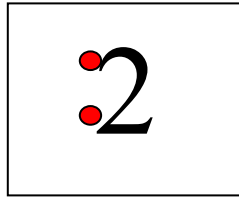


The Potential Dangers of Teaching The Touch Math™ System of Computation

By Angela G. Andrews

What is Touch Math™?

"Touch Math™" is a system of assigning a touch point to each number. The number 1 has one touch point; the number 2 has 2 touch points, etc.



Students are taught to touch these points and count them to get an answer. Later students are taught a series of rules for using touch points to obtain answers to problems involving the operations of addition, subtraction, multiplication and division.

Where did Touch Math™ come from?

Touch Math™ was originally developed to teach cognitively challenged adults how to perform basic operations of additions, subtraction, multiplication and division. These students, who found memorizing the facts to be extremely difficult, were given an acceptable process for arriving at the correct answers needed to pay for small purchases or receiving correct change. Some LD teachers picked it up and began to teach it to their students. When LD students were able to compute more accurately and quickly than their “regular” education counterparts in the classroom, some classroom teachers began to teach it. Because it produces quick, accurate answers, teachers are often enthusiastic about the system. They don’t have to worry about their students knowing their basic facts, and their students perform well on timed tests.

Why is it harmful?

Although it is certainly true that students who use the touch point system arrive at accurate answers quickly, the use of **Touch Math™** and its underlying philosophy goes completely counter to the vision of the NCTM *Principles and Standards for School Mathematics*. It is an artificial program, which encourages rote, mindless, “pencil tapping”. The method forces students to think of numbers as discrete units, and, as a result, it inhibits understanding of place value concepts. It is rule bound, and teacher

lead. There are no strategies taught – only rules remembered. In this sense, it is a giant leap backward and puts the student, says Bob Wright of Southern Cross University, founder of Math Recovery, “on the path to nowhere. **Touch Math™** forces the child to solve addition and subtraction problems by counting on or back, when even those students who qualify for and receive intervention services are capable of leaving first grade exhibiting much more sophisticated non-counting behaviors.”

Why is using touch points any different than using manipulatives?

An argument used to support using **Touch Math™** is that it is like any manipulative that is used to make connections to concepts then discarded when no longer necessary. This argument is in error. First, touch points are not manipulatives, but rather arbitrary symbols added to the numbers. Manipulatives are real concrete materials that are used to help students make connections to abstract mathematical concepts. Dots on paper are not real, nor are they concrete, but simply additional abstract markings. Students cannot manipulate them in any way. They can only touch them on paper. Another problem with **Touch Math™** is that teachers who use this system are so impressed with the speed and accuracy resulting from teaching this method that they tend not to see a need for manipulatives. Instead, they replace cognitively valuable models that truly represent the operations, with the pencil tapping **Touch Math™** method.

Can't I teach Touch Math™ along with other strategies?

With **Touch Math™**, the foundational concepts of addition, subtraction, multiplication or division are ignored. The method ignores the student's need to:

- Develop a visual image of how sets are joined and separated, grouped and shared.
- Develop non-counting strategies for adding and subtracting, such as partitioning, using doubles, anchoring ten, using the commutative principle, etc.
- Develop strategies for doing mental mathematics. (Without visible “touch points” children trained in this system have few options for solving mental problems.)
- Develop concepts of multiplication and division.
- Develop understanding of the distributive property of multiplication over addition.
- Understand the relationship of numbers as defined by our base ten place value system.

This technique bases computation on arbitrary rules rather than on the foundations of the base ten number system. In fact, the authors of **Touch Math™** state that they have no intention to teach place value, which should, they say, be taught only *after* students master computation skills. In reality, by the time students master the increasingly complex **Touch Math™** rules, they have little patience for learning to understand place value.

- Think about numerals as representations of quantity. The number 38, for example is not thought of as “almost 40”, which would be helpful for estimating an answer, or as 3 tens and 8, which would be helpful for understanding place value concepts. Instead 38 is thought of as an 8 which requires 8 taps and a 3 which required 3 taps.

The **Touch Math™** system is comprised of a series of rules or contrived methods that students must follow in order to get the correct answer. The teaching of such arbitrary rules to get correct answers is harmful to children’s learning of arithmetic because the rules go counter to children’s natural way of thinking. These rules “unteach” the intuitive understanding that students have of place value, thereby depriving them of opportunities to develop number sense. The history of computational procedures suggests that students would understand algorithms better if they were allowed to go through a constructive process. (Kamii) However this process is time consuming and requires cognitive effort on the child’s part. Giving the child the option of “not thinking, just doing” is seductive, especially for a teacher frustrated by students’ difficulties in understanding mathematics or learning facts. However, it should not be considered by primary teachers. Forcing, encouraging, or even allowing students to give up their own thinking and follow the rules of **Touch Math™** is harmful to children’s autonomy and separates students from their own thought processes.

Won’t students discard this method when they become more proficient?

To be fair, this scenario is possible. To be truthful, all available evidence indicates that it is not likely. Manipulatives or the *natural* finger counting strategies that young children use are discarded when their use becomes unavailable or cumbersome to a child who has internalized the concept with the help of such manipulatives, or who has learned non-count by one strategies, or math facts. On the other hand, “touch points” never become too cumbersome, because using this system is *quicker* than thinking and always available. Students who are addicted to **Touch Math™** then have no incentive to either understand math concepts or learn number facts. **Touch Math™** becomes a “nasty addiction” which has proven to be practically impossible to break. Teachers all over the country tell horror

stories about how difficult it is to break students of the “touchpoint” habit, and more importantly, how little number sense and place value understanding these students have. Parents, who may be impressed initially with their child’s ability to compute so quickly and accurately, are later alarmed when they realize the damage done to their children’s mathematical health. As a pre-service university instructor of math methods, I observe the crippling effects of **Touch Math™** on students each term as they try to break this tiresome habit and, at the same time, develop the missing number sense they know they need to teach mathematics themselves. (Just recently an elementary school principal confessed to me that she did not *know* the answer and had no other strategies to figure *out* the answer to $9+5$, except by using the touch point system she had been taught as a child. She recognized how much she had been handicapped by this method and was terrified that someone would find out her secret.)

At best, **Touch Math™** is an unnecessary handicap to impose on those students who are capable of building an understanding of mathematics, given adequate time and experience. At worst, **Touch Math™** fails to encourage strategic, logical, and autonomous thinking, replacing it with a mechanical, non-thinking process, which will not prepare our students for the challenges of the 21st century.

Teachers who are considering using **Touch Math™** or who currently use this system are urged to reflect on the following questions about the possible long term effects of teaching **Touch Math™**:

- While **Touch Math™** is easy to teach and easy to use, does it actually promote mathematical understanding?
- Can I be assured that I am not "saddling" my students with a system that produces quick, accurate answers in the short term, but has the potential for doing permanent harm?

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