The Common Core Math Standards: When Understanding is Overrated

Barry Garelick*

June 23, 2010. Earlier this month, the Common Core State Standards Initiative (CCSSI)—a state-led effort coordinated by the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO)—issued the final version of its math standards for K–12.

The draft standards were released in March and CCSSI allowed the public to submit comments on the draft via their website. Over 10,000 comments were received. The U.S. Coalition for World Class Math was one of the commentators and I had a hand in drafting comments. We were concerned with the draft standards' use of the word "understand" and pointed out that the use of this verb results in an interpretation by different people for different purposes. I am pleased to see that the final version of the standards has greatly reduced the use of the word "understand", but I remain concerned that: 1) it still is used for some standards, resulting in the same problems we raised in our comments, and 2) the word "understand" in some instances has been replaced with "explain".

I am not against teaching students the conceptual underpinnings of procedures. I do not believe, however, that it is necessary to require students to then be able to recite the reasons why a particular procedure or algorithm works; i.e., to provide justification. At lower grade levels, some students will understand such explanations, but many will not. And even those who do may have trouble articulating the reasons. The key is whether they understand how such procedure is to be applied, and what the particular procedure represents. For example, does a student know how to figure out how many ⅔ ounce servings of yogurt are in a ¾ ounce container? If the student knows that the solution is to divide ¾ by ⅔, that should provide evidence that the student understands what fractional division means, without having to ask them to explain what the relationship is between multiplication and division and to show why the "invert and multiply" rule works each and every time.

As students progress through the grades, they acquire more procedural fluency, and ultimately more understanding When they are in algebra classes and are able to use algebraic symbols, mathematical reasoning is increased because they have more tools with which to express mathematical ideas. At that point, it is perfectly reasonable to expect students to be able to show understanding by requiring them to solve specific problems. For example, students are able to demonstrate "understanding" of the derivation of the formula for the quadratic equation, by solving the equation ax2 + bx + c = 0 using the method of completing the square.

The myth prevalent in schools of education and in education in general, is that explaining an answer is inherently connected with understanding it. Thus, even with CCSSI's decreased use of the word "understand", the belief that unexplained answers are "mere calculation" seems to pervade these standards. Students who do not apply math to real-life situations or demonstrate their strategies in words and pictures, however accurately they calculate the answers, are held to not understand underlying concepts. The ultimate result of such misguided thinking may be that students who cannot calculate correct answers but can "explain" their thinking will get partial or even full credit for incorrect answers on tests. Most importantly, however, the authors of these standards in urging explanations fail to acknowledge that there are some extremely analytic children who for a variety of reasons cannot express themselves well in writing. (Some of these may have Asberger's syndrome or be highly functioning autistic) Many of these children can

easily do math in their heads, and are able to solve very complex problems, but often will be unable to explain—in writing or verbally—how they arrived at their answers.

Asking for justifications, interpretations and explanations may manifest itself by asking students to provide two or three ways to solve a simple computation problem and asking them to explain their procedure in words and draw pictures. Sadly, such enforced understanding will likely result in students being required to memorize (by rote) an explanation they don't understand for a procedure they cannot perform.

Citation: Garelick, B. (2010). The common core math standards: When understanding is overrated. *Nonpartisan Education Review / Essays, 6*(3). Retrieved [date] from http://www.npe.ednews.org/Review/Essays/v6n3.pdf

---

*. Barry Garelick is an analyst for a federal agency, and is a co-founder of the U.S. Coalition for World Class Mathematics (http://usworldclassmath.webs.com/)