

Date: Friday, July 10, 2015
To: David Leonhardt <leonhardt@nytimes.com>
Subject: Aspen Ideas Festival - Is Math Important?

Dear Mr. Leonhardt,

Applied Math at Yale followed by the Pulitzer? My compliments and then some. You may be surprised to find that the former academic qualification is higher than that of one of the 3 top authors of the Common Core-Math and the single head of math for one of the Common Core-Math testing consortia, the SBAC. I first worked extensively with Phil Daro (English Lit) in 1988. He was wrong then that he's been consistently wrong in the decades that have followed. Constructivism uber alles.

I just watched this video and feel compelled to offer some well-informed counterbalance.

<http://video.pbs.org/video/2365521689/>

Your(?) choice of math ed “experts”, Jo Boaler and Elizabeth Green, offers a pretty good summary (condemnation?) of the entire enterprise. I know that the NY Times Magazine gave great coverage to Elizabeth Green’s mistaken ideas about Japanese classrooms last summer but here is a rather detailed rebuttal to her premise supported by another US math ed professor, albeit one with Japanese roots that gave her description unwarranted credibility:

Bishop, W. (2014). Why Do Americans Stink at Math? Some of the Answer. Nonpartisan Education Review / Essays, 10(2).

<http://nonpartisaneducation.org/Review/Reviews/v10n1.htm>

Without wading through the details, I’ll offer a couple of summary points including the Finnish “revolution” in mathematics education that is mostly smoke and mirrors. First, a sample of actual Japanese classrooms observed by some education school students and faculty who came expecting an “Elizabeth Green style Japanese classroom” and found almost exactly what I grew up with before the Sputnik era (and the first New Math) that had educationally prepared the US to so quickly respond to the Soviet challenge of world technological superiority:

<http://www.linfield.edu/linfield-news/students-and-prof-examine-why-japan-outsmarts-u-s-in-math-scores/>

“Japanese teachers focus much more on whole-group instruction with little interaction.

“Students sit in rows and are expected to listen quietly. Teachers rely on direct instruction rather than investigative mathematics, but although they ask few questions, the questions they do ask are useful in guiding student understanding.”

“Not a single student pulled out a calculator during class,” Drickey said. There were no overhead projectors, televisions, computers or laptops.

Regarding the great improvement in Finland, it never happened. The dramatic performance increase was entirely due to a change of international assessments from one far more reliable - the TIMSS, still viable and run out of Boston College - to the PISA out of the Freudenthal Institute of the Netherlands conceived with an entirely different (and mathematically suspect) philosophy. The US and Finland were back-to-back on the original TIMSS in 1995 but, in the years since (2011 most recently), Finland has slipped a little while the US has moved quite a bit ahead (although still far behind the high-performing Asian nations). Regarding the assessment of

improvement in Finnish mathematics, it would be hard to describe it better than did the president of the Finnish Mathematical Society in this open and multi-cosigned letter:

<http://matematiikkalehtisolmu.fi/2005/erik/PisaEng.html>

“However, mathematics teachers in universities and polytechnics are worried, as in fact the mathematical knowledge of new students has declined dramatically.”

The other elementary school mathematics education “expert”, Jo Boaler, begs for explanation.

There is no doubt that she has become a Common Core-Math rockstar:

<http://hechingerreport.org/memorizers-are-the-lowest-achievers-and-other-common-core-math-surprises/>

<http://www.youcubed.org/why-we-need-common-core-math/>

<http://www.theatlantic.com/education/archive/2013/11/the-stereotypes-that-distort-how-americans-teach-and-learn-math/281303/>

<http://www.usnews.com/news/articles/2015/02/09/should-we-stop-making-kids-memorize-times-tables>

<http://www.heinemann.com/blog/the-mathematics-of-hope-moving-from-performance-to-learning-in-mathematics-classrooms/>

<http://anhpe.org/2015/02/09/fluency-without-fear-the-best-ways-to-learn-math-facts-by-jo-boaler-and-others-at-stanford/>

http://blogs.edweek.org/edweek/curriculum/2015/05/professor_stop_math_memorization.html?c mp=ENL-EU-NEWS2

<http://blogs.seattletimes.com/educationlab/2015/02/09/slow-down-math-prof-says-timed-testing-can-harm-skills/>

Note that the last one even identifies her as a mathematics professor at Stanford, not math ed; beyond absurd.

Her research is some of the most unprofessional in the math ed “biz”, already a suspect environment. In fact, some of the professors in Stanford’s department of mathematics have tried to get her research independently evaluated as fraudulent and with good reason. I’ll go into some detail but you may have noticed a glimpse in her definitive assertion in the Q&A toward the end of the Festival video where she emphatically dismissed the comment of one of those still on stage in regard to some students having a special ability toward mathematics as with music or art. She strongly asserted that “research proves” it’s all about how mathematics is taught, no recognition - even denial - of student differences. Yes, such “research” exists but it’s education research. You didn’t major in math at Yale without some above-average natural talent; education research be damned.

Her own published research all the more so - even her special modus operandi. She first came to Stanford having achieved an international reputation in her native England (from a similar sort of study that she repeated here) from a highly popular (in math education) book, “Experiencing School Mathematics: Traditional and Reform Approaches To Teaching and Their Impact on Student Learning” (2002 edition). In her report of the study, the low performing school from a community with lower socioeconomic/education level, “Phoenix Park,” advanced to outperform a previously superior school, “Amber Hill” on England’s end of secondary exam (the GCSE) through implementation of her mathematics methods. In fact, different regions have different GCSE exams and Dr. Boaler was trying to persuade her region to use her self-constructed GCSE replacement and the school (Phoenix Park only) received an experimental waiver to use it for several years. At the end of the experiment, the school was obligated to administer the regular one, performance was miserable, and all consideration of replacing the regional exam with hers

was dead. By carefully protecting the identification of the schools (clearly identified using pseudonyms), the bottom line never became well-known. The bottom line was that what had been "Phoenix Park" ceased to exist in its locally tainted form and it reopened under a new name as a far more traditional school under a new name.

Her US independent "success" was a repetition with three California schools in the wider Bay Area in schools with quite different socioeconomic/education levels with the lowest (including average student performance) being her "Railside" (think "other side of the tracks"), again with the actual identification of the schools carefully protected. Her claim is that this practice is mandated (it is education industry SOP) by laws covering human subjects experimentation but that is not true - only the identities of the students involved are protected, not the schools or even individual classrooms. Under a five-year NSF-funded study of these schools with Railside's outstanding performance at the end, her fame went nationwide. For example:

<http://www.edweek.org/ew/articles/2005/02/16/23math.h24.html?querystring=viadero&levelId=2300>

"Although the Railside 9th graders had started out behind the Greendale and Hilltop freshmen, they began outperforming their suburban counterparts within two years, according to the study. By 12th grade, the Railside students outscored the comparison group on one test by an average of 8 points".

Those results were based Boaler's own assessment instrument. Viadaro almost offhandedly repeated Dr. Boaler's words,

"On California's state-mandated tests, Railside students did no better than those in demographically similar schools."

"Did no better" was quite an understatement - lowest of the low. As indicated in the article, Debbie Viadaro asked my opinion about the results. I acknowledged apprehension but ignorance of the specifics and suggested that she ask Dr. Boaler for the names of the schools (to be protected as good reporters do, of course). In fact, she had but Dr. Boaler had refused. To my way of thinking, that should've ended any thought of publication but that's not the way education writers operate. My apprehension stemmed from my reading between the lines of Dr. Boaler's own writing about Phoenix Park and Amber Hill (the actual schools had not yet been identified although some mathematicians in England had been working on it).

Based on data that she had selectively extracted but quoted accurately in publications then linked at her website, I was able to use the entire California database to positively identify the high schools. Far from how she described them, in the last year of her 5-year study, Railside was the least effective regular public high school in the state of California. To start with, it was an API (Academic Performance Indicator) 1-1 school - in the bottom 10% of all high schools overall and in the bottom 10% of 100 comparable schools. Restricting the data to those schools that were 1-1 (different schools in the 1st decile have different comparable schools so hundreds of schools, not 10% of 100), it was the absolute lowest except for six or seven special schools (a state school for the deaf and several "continuation" schools, schools that districts set aside for their especially problematic students, in affluent districts such as Palo Alto).

"For instance, 41 percent of the Railside students had taken calculus by the end of 12th grade, compared with 29 percent of the students at each of the other schools."

Reality? As opposed to the other two schools, no one at RAILSIDE took the College Boards' AP Calculus test in the entire 5 years of her study. Moreover, based on Venn diagram analysis of CSU admissions and the ELM (the system-wide Entry Level Math exam), many of those "had taken calculus" students who were admitted to some CSU campus (such as mine) had to begin in noncredit remedial math - not even competent at the level of intermediate algebra.

Far more important than Jo Boaler's unwarranted fame is the implication as to how Common Core-Math is playing out across the country. The concept of "deeper understanding" and its demonstration is nothing close to what people who know mathematics want to see and know what students need for deeper study of mathematics in math-based disciplines. A competent but naïve mathematician can read the preamble chapter to the CCSS-M, Standards for Mathematical Practice, and enthusiastically exclaim, "Right on!" Given the foreknowledge that Phil Daro was involved from Square 1, my immediate reaction was, "We're dead. The math ed "experts" have obtained national-level endorsement of their beloved Constructivism. From here on everything is arranging desk chairs." Regrettably, David Coleman's ideas for revising assessments of readiness for admission to self-respecting universities, especially for students with aspirations for math-based major careers does not bode well either. Tom Loveless of the Brookings Institute nailed it in his latest:

<http://www.brookings.edu/research/papers/2015/07/09-chalkboard-common-core-the-bad-loveless>

Whereas:

"It is true that standards, any standards, cannot control implementation, especially the twists and turns in how they are interpreted by educators and brought to life in classroom instruction. But in this case, the standards themselves are responsible for the myriad approaches, many unproductive, that we are sure to see as schools teach various algorithms under the Common Core."

Summarizing, watching the Festival video was a rather disturbing experience. The NY Times needs to do an about-face and inform the nation that this optimistic promise for progress in mathematics education was derailed before it ever began.

Respectively,

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