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Sept. 28, 2016

I have included a copy of your excel file “AZ Draft Math Standards Technical Review Doc August 2016.xlsx,” the Word file “AZ Introduction Mathematics Draft Standards August 2016.docx,” and the Word file “AZ Math Glossary Draft August 2016.doc.”

In all three, I include my comments in red. In the excel file I only went through the material in grades 2 and all grades from 4 – 8, as well as Algebra I, Geometry, and Algebra II. I next looked at grade 3. After I made extensive suggestions about the the first standards there, I found that it was impossible for me to even make suggestions about the remaining one. I literally knew no way to fix them. So I stopped and did not look at the remaining grade three standards nor any of the Kindergarten and first grade standards.

(Frankly, besides all the issues in third grade, I was so tired of the necessity to comment on virtually every standard in the areas I had looked at that, finally, I said “Enough.”)

Overall, what seems to have happened is that the writing group in Arizona started with virtually all the Common Core Math Standards, got rid of a few of the absolute worst, and then proceeded to generally modify the remaining standards in such a way that they usually became worse than the originals.

What I found was that way too many of the standards in this draft were filled with actual mathematical errors, both in their original statements in Column A, and their revised statements in Column B. Moreover, remembering that the role of standards is to guide the construction of tests to measure the students understanding of the material actually taught, I found that almost half of the “standards” I looked at were not really standards at all, but descriptions of the kind of pedagogy that “should be” employed in covering certain topics. (Additionally, almost without exception, there is no reproducible research that shows these pedagogy methods actually work by improving student understanding of the mathematics involved.)

These issues of pedagogy should be left strictly to the teachers, and the standards should be clear descriptions of the kinds of questions that tests should use to evaluate student understanding of the topics under consideration.

In the third file, the glossary, my overall view as stated at the beginning was simply “OVERALL, THIS GLOSSARY ISN’T MERELY BAD IT IS HORRIBLE! I’VE GIVEN CORRECTIONS FOR THE ITEMS ON THE FIRST FEW PAGES, BUT I JUST DIDN’T HAVE THE ENERGY TO CORRECT ALL THE ENTRIES.”

In the second file, my feeling was that the material was not quite as horrible as the glossary. However, my overall view is probably quite well represented by the following quote: “There is virtually no real research that supports the assertion that these standards are what every student must know to be ready for both college and the workplace. In particular, there are very large differences between these standards and those of the high achieving countries. Indeed, these standards are very close to the kinds of standards that were in place in the early 1990’s and which did not work at all well in this regard.”

Of course to say that the typical standards in this country, in particular in both Arizona and California in the early to middle 1990’s didn’t work at all well doesn’t begin to describe the amount of damage they caused. Moreover, we need to be aware of what the failings of

those standards actually were and how they affected student outcomes during that period. Unfortunately, there is absolutely no evidence that the group that revised the Common Core math standards for Arizona to the draft being considered here had any idea of those old standards and what they had actually led to.

On the other hand you have a real expert on these issues in Arizona now: Prof. Fabio A. Milner, Professor and Director of Mathematics for STEM Education at the Arizona State University School of Mathematical and Statistical Sciences in Tempe. I would strongly recommend that you try to get him involved in this work. I've worked with him very well in the past and know he will be able to fix the issues I've pointed out.

Yours,

R. James Milgram