

Concerns

* Wendy Tokumine (wendyt@ALOHA.COM) on February 3, 2000:

I teach in a school with a 4x4-block schedule. I had one student in AP Calculus this year who took IMP 3 and IMP 4 last year. He wanted to take Trigonometry and then Calculus this year, but he was scheduled for Calculus in the first session and Trigonometry in the second session (Calculus is only offered first session). I counseled him, but he chose to remain in the calculus class. He came occasionally for extra help after school (at my insistence) and passed the first term with a C, but he failed the second term. He really got lost when we got into trigonometric integrals. Although he failed, I feel he gained a lot just by being in class.

The majority of our students who take IMP are students who previously would have been assigned to General Math or Pre-Algebra. Many of them enter IMP with very poor arithmetic skills and limited algebraic skills. The 4x4 block schedule (or even a conventional schedule) does not allow time for teachers to teach IMP and do remediation. This is why we suggest students take Pre-Algebra or Algebra instead of Algebra 2/Trigonometry after IMP 1, IMP 2, or IMP 3. This works really well for both the students and the IMP teacher who teaches the next level.

[For this discussion, see **IMP to Calculus**.]

We are very concerned about how well, or not so well, our IMP graduates are faring at the community colleges. Two of our local community colleges report that the IMP students do poorly on the COMPASS math placement test (computerized with no calculators allowed) and in the Pre-Algebra class they then must take due to their low test scores. One instructor said the IMP students are poor in basic math skills (fractions, decimals, and percents). I asked for data to support this, but the college counselor had none. They will consider collecting data (beginning this summer) and to provide me with more concrete information.

* Gregory Redfeairn (gregoryr@ICEBERG.ORG) on February 3, 2000:

A common complaint with both college and high school reformed math programs, backed up by a little bit of research evidence, is that students lack algebraic manipulation skills. I am also interested in how to address this problem. However, mindless algebra skills are the reason we have reformed math. It seems as if there should be a common solution somewhere.

* Sue Parker (sbparker@besteffort.com) on February 3, 2000:

From my experience, there is a wide-spread misperception, even among IMP teachers, that students in the traditional math programs can do fractions, decimals, percents, and algebraic manipulation. That just is not so. All we have to do is look at past history. A few of the best students did this pretty well and went on to take more math. Most students did not do this well and dropped out of math as soon as they could. Ask the parents of either kind of student about their children's experiences in math. Most students hated math because they did not understand it, and now, they do not

remember how to do anything. As Greg wrote, this is why we have reformed math. We now have more students, and more diverse students, taking more math in the reformed programs and also in traditional math classes taught using the NCTM Standards. I cannot quote specific statistics, but this is my impression after talking to many different teachers, in many different high schools, using many different programs, in many different areas.

* Diana Obstfeld (diana_obstfeld@CEO.CUDENVER.EDU) on February 3, 2000:

My concern is how well the traditional kids do at the community college. I teach at one, and my experience is that MOST of these students have difficulty when they enter a college math course in all of the above areas. I had one student in my college algebra class who had completed courses in Core-Plus. He was my best student. All others had been taught in traditional programs; they struggled the entire time.

My problem is the design of the placement tests. I think these can be improved to assess conceptual understanding of mathematics, not just procedural understanding. Our local community college is in the process of doing this.

* Harriet Davis (hadavis@CRUZERS.COM) on February 3, 2000:

Our local community college also stated that our graduates do not do well on their test. I did some statistics and discovered that our graduates who go to the local college are 1) students who never took a college preparatory math course of any kind or 2) D or F students in IMP!

So, I take that kind of criticism with a grain of salt.

* Marie Larsen (the4larsens@THEGRID.NET) on February 4, 2000:

Ditto. Once a high school teacher, I now teach at a community college. Some of my former IMP students have been very successful in my college courses. It just depends on each individual and whether he/she likes to use IMP as a scapegoat for being a poor student. Before, students just blamed mathematics in general. Now, they have an actual program name to attach to their blame!!

* Gregory Redfeairn (gregoryr@ICEBERG.ORG) on February 3, 2000:

Some non-math teachers in my building approached me with similar concerns. My best reply was to point out that basic math skills such as fractions, decimals, and percents should have been learned in elementary school. "So don't complain to me. Complain to their grade school teachers." (Say this with a smile if you want to keep your friends.) This is a rather flippant, but valid response because my charge, according to Chicago testing policy, is to teach algebra, formulaic and Euclidean geometry, trigonometry, and pre-calculus. (Pre-algebra of any kind is no longer an option in Chicago high schools.) I also point out that IMP has an entire unit (*The Game of Pig*) devoted to these three biggies in 9th grade to start the students out grounded in these areas. In a traditional

book, they would not get anything. IMP allows fractions, decimals, and percents to come up and be discussed over and over for 4 years.

* Bonnie Blustein (bonnie.blustein@worldnet.att.net) on February 3, 2000:

I am teaching 9th graders (CPMP not IMP) in a school that puts all 9th graders into Algebra (CPM or Glencoe), unless they place into Geometry. It is impossible to ignore their lack of skills and the accompanying concepts. Many have not memorized the times tables and must use a calculator or their fingers. Many have trouble with division. For example, they may do $12/2$ as a long-division problem or do $21/5$ as a long division problem and come out with "4 r 1" or "4.1" for an answer. And/or, many do not know when it is appropriate to multiply vs. divide. Fractions? Decimals? Percents?

CPMP, like IMP, offers opportunities to teach/reteach/reinforce all these skills, but I am finding that I need to do "the max" with this and then do some more. I am currently trying to plan some activities for second semester that will "drill" the students on basics (and I mean the very basics). These activities cannot be insulting to them and should tie to the algebra they are doing at the same time.

Greg, I am sympathetic to the pressures to teach the curriculum, to teach to the test, and also to teach good mathematics. But, I think it would be irresponsible to blame the grade school teachers (no matter how diplomatically) or the administrators who have allowed this mathematical malpractice without also trying to meet those students' real need to learn the basics. This must be done, even if the time cuts into some of the cool stuff we want to do with them and even if we don't "cover" whatever curriculum a district or state has dealt us.

* Gregory Redfeairn (gregoryr@iceberg.org) on February 8, 2000:

Bonnie, I totally agree. My comment about elementary teachers is purely defensive. The comments are not intended to blame elementary teachers. My rather terse comments only work, because I perceive there to be confusion when people ask that high school students be taught "basic skills." For anyone other than a math teacher, "basic skills" tend to include strands of arithmetic and non-algebraic measurement. For math teachers, "basic skills" include symbolic pattern (*Alice*), complex estimation (statistics and probability that, outside of IMP, are currently found only at the college level), graphical representation (*Cookies, Meadows and Malls*), etc. We know there are students in class who are capable of cultivating these skills, so we at least need to introduce these concepts to our classes.

The most common argument against reformed math is that "basic skills" are not (apparently) taught. I think it is in our best interest as math educators to help define to the general public, and to one another, exactly what these "basic skills" are, what they are not, and which skills are expected in the common high school curriculum. In addition, the diatribes against reformed math never mention those math skills we are trying to introduce (such as basic statistics and probability which will serve students well in college and in life) that were not previously taught. The only call I hear from the "back to basics" people is a call for elementary grade skills. I think they sound rather silly, and

somehow I think the general public can be educated regarding these important distinctions.

* Brian Lawler:

I do not accept this as being a problem. On Tuesday, one of my Calculus students typed (something like) $10/2$ on his calculator. He is doing Calculus. You should have seen the silly look on his face when he realized what he had done.

* Betsy Adams (sadams@DHVX20.CSUDH.EDU) on February 4, 2000:

I, along with most of the general public (including parents), think there is a problem when a student uses a calculator to do $10/2$. Knowing when to use a calculator is as important as knowing how to correctly use it. I think a car is a wonderful thing to use, but I worry about those healthy individuals who use their car to drive 10 feet to get across a quiet street.

* Brian Lawler (brlawler@EARTHLINK.NET) on February 5, 2000:

Betsy, please allow me to clarify. I do believe that not knowing the times tables is a problem. (I suspect we need to come to agreement on what "knowing the times tables" means.) I also believe that when students who struggle with algorithm-driven methods to compute are finally freed of the thought-constricting chains of the common school curriculum, they become comfortable determining $21/5$. They are able to do this without formal instruction. That comment is based upon observations and conversations I have had with several friends. Many of these friends are actually better at computing tips than I am. I have to purposely remind myself how to estimate 18%, because my first instinct is to multiply by 0.18.

I further suggest that my observation of my student using a calculator caused me no concern, because $10/2$ was not the problem he was working on. He was creating an understanding of the Trapezoid Method for estimating a numerical integral, and his mind was working on that problem. I am not concerned about this kid. As I said, as soon as he pressed enter, he knew he was silly to have done that.

I realize inappropriate use of a car is a tongue-in-cheek metaphor for inappropriate calculator usage. However, it is also workable to strengthen my point. It might not be until that person looks back after driving across the street that he/she will realize the silliness of the choice. Or, maybe this realization will happen when the person returns home on the second leg of the journey. Or, perhaps, the person will return home, and his/her spouse will point out the foolishness.

We do not all get it right the first time. And we do not all get it right even after we have been told the right way to do it. But, we will get it right, for ourselves, if we are given the opportunity to determine what is right for ourselves. And, that is the (a) function of schools – to allow each child to develop the ability to determine for his/herself the best option for whatever life opportunity presents itself. Young people deserve the inner

confidence to decide for themselves. And, they deserve the opportunity to develop the competence upon which they make these decisions.

* Bernard Robinson (BernardRobinson@HOTMAIL.COM) on February 6, 2000:

Although students being able to perform arithmetic calculations quickly would make classwork and lessons run more smoothly, it is not necessary in order for students to gain an understanding of many topics presented in math class. It is necessary, however, for students to understand the concepts of fractions, multiplication, etc., which are needed to perform these calculations. For example, it is not as important that students know that $9 \times 8 = 72$ as it is for them to know that 9×8 is the same as adding nine eights.

I do have a problem with the fact that many of my students do not have this understanding of concepts. So many students think that a remainder and a decimal are the same thing (i.e., $2R1 = 2.1$). This implies that the answers to the wonderful problems, so vigorously worked on in math class, may be totally meaningless to these students. This possibility makes me wonder how well they understand the newer concepts such as standard deviation, probability, or even that of a function. For this reason, I feel it is important to review basic concepts as often as possible. I place a problem or two with the warm-up and also review them selectively as classwork is presented or previewed. Hopefully, by doing this, those who need that extra help will pick something up.