

Comments, Questions, and Ideas

From RIGHT STUFF Workshops

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Questions

What are the actual math objectives of the course, and is the content lessened by mostly algebra skills?

Currently, research is showing that instructors need to focus on the big ideas rather than on isolated skills. Think about what will stay with the student and what will cause changes in the way the student behaves, thinks, or feels. Obviously, these big ideas (problem solving, critical thinking, communicating mathematics, analyzing data, making informed predictions ...) require some skills. Just as obviously, the big ideas of calculus require the use of many algebraic skills. Can more of these be taught and better learned in a just-in-time manner, reducing the content of pre-calculus topics, many of which calculus teachers say are never learned anyway? The big question then is what is mathematics? For too many of us it is a set of isolated skills that we believe (and that we can see) make up the beautiful structure of our discipline. However, for too many students, the skills stay isolated and are never connected to meaningful activities. The challenge then is to create a learning experience that matches the needs of the students. Reducing the algebraic skills required of them and increasing the understanding of major concepts is, I think, appropriate for most students.

How do you start the basic aspects of mathematical modeling and when and how do you get regression of fit in?

It would be best if when students starting looking at linear functions modeling was introduced and then thoroughly covered. Allowing students to first pick two points in the data set and use that as their line of good fit, then using technology to draw a line that “looks good.” At that point, it is logical to look at residuals. Spreadsheets make that really easy. (See: <http://epublications.bond.edu.au/ejsie/vol2/iss1/7/>) or (<http://www.waketech.edu/~rlkimbal/TTT/modeling.xls>) or (<http://www.waketech.edu/~rlkimbal/TTT/showregr.xls>).

What reform texts are available for college algebra?

I would prefer not to offer suggestions. However, I can tell you the four authors who represented their texts at the 2006 MAA workshop on college algebra: Don Small, Beverly Michael, Sol Garfunkel, and Bruce Crauder.

Please send me your (Wake Tech) course outline.

Go to: <http://www.waketech.edu/~jawillia/> and click on **Syllabus** under MAT 161 or use this link: <http://www.therightstuff.amatyc.org/MAT161syllabus.pdf>.

How do you address the fact that more students take calculus in other countries? (Perhaps they are more ready for it with stronger middle and high school preparation.) But, this seems a bit to be dumbing down the curriculum. I believe in motivational problems but structure too.

It is a fact that the US needs to produce more STEM graduates. However, that does not change the need to provide non-STEM students with more appropriate mathematics.

Is there a preference of Excel over graphing calculators?

I believe that providing students with a positive and useful experience with spreadsheets will benefit them enormously. Further, Excel makes a great presentation tool. But, N-Spire has a spreadsheet feature and can provide students with a similar experience. Given the choice, and given the resources, I prefer Excel. That should not come as a surprise to anyone.

How do you deal with the need for multiple versions of tests (if you emphasize data analysis)?

Constructing a test that reflects the learning objectives of the course is difficult. The team that teaches the course at WT spends a great deal of time writing authentic questions that measure what they believe is important and, at the same time, is a learning tool as well. I have uploaded one version of the four tests at www.therightstuff.amatyc.org/tests. (Please consider these tests as “Not for publication”.)

How do you keep the student input flowing during the scenarios? My students are self-conscious and don't want to 'look stupid.'

The attitude of the instructor is critical. Students have to feel comfortable in the classroom, with their peers, and with the teacher. They can come to your classroom with experiences that have taught them to be quiet. There are many things you can do to change that (see ideas on decreasing math anxiety). I would say, briefly, that by coming to the classroom early, you can spend some informal time with students, helping them feel more comfortable with you. You should tell them what you expect in your classroom, more than once; that you expect students to answer questions and that some answers will be better than others.

Due to the amount of time modeling takes for students, what needs to be removed from the actual curriculum?

The short answer is that depends; it depends on the goals of the course. Personally, I see no reason for non-stem majors to spend any time trying to simplify rational algebraic expressions, to solve equations with radicals, solve rational equations, or to apply the properties of logarithms to simplify logarithmic expressions (or make them even more complicated by changing them around). The simplest answer, and one echoed in the Voices of the Partner Disciplines (MAA), was whatever you teach – teach it well!

Can students make the transition from developmental math courses to a refocused college algebra course?

It would appear that most developmental math sequences were designed (many years ago) with the intent of preparing all students for calculus. Since so few students ever take (or want to or need to) take calculus, the developmental sequence needs to be revised even more so than college algebra. In my opinion, the developmental math sequence needs to prepare students for a course similar to a refocused college algebra (modeling with technology).

How do you assess modeling done with Excel other than assigning problems?

Faculty at WT assign projects that require students to use Excel. The tests also contain problem that require students to have worked in Excel and used it as required.

Do you think that students would get the more critical thinking skills that are math-oriented from statistics?

Statistics is very useful to students who will later be consumers, employees, and voters!
However, if that were the only course they took, I'd be concerned. The idea of rate of change and how the rate of change is different for linear, quadratic (polynomial), and exponential functions is I think just as crucial as understanding and being able to use the standard deviation.

General Comments from Participants

Our math department needs more training in using technology.

Real life examples were good.

This was a good presentation. I will try to integrate the ideas into my classes.

Good work! We all should go to this model.

Thank you. Stay persistent in spreading the word.

Good examples. I would use some in my intermediate algebra or pre-calculus class.

I may use some of the data in Module 0 in my intermediate algebra class.

Although I teach developmental, I plan to implement some data activities.

Good ideas:

- Faculty meeting to discuss what's going on in the course; developing and sharing
- Projects; I will implement a few in the fall
- TI-Nspire; just got them in, very motivated to get going with them

We need to split our college algebra into two courses.

Please email me the PowerPoint you used.

I'd like to see these ideas implemented in the intermediate algebra level as well.