

Incorporating Study Skills into Mathematics Classes
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This is the introduction to my talk at AMATYC. Here I give my reasons for why we, as math instructors, must incorporate study skills into our developmental mathematics classes. After listing the different study skills I address in my math classes, I explain how I incorporate them into my math classes without sacrificing material.

Why teach study skills?

Are developmental math students struggling solely because of poor math skills? Although poor math skills could be part of the problem, I don't think that's the only reason they are struggling. Could part of the problem be that they do not know how to learn mathematics? I think that this is the key. If a student is lacking the necessary math study skills, then success is a long shot at best.

Should we teach study skills?

There are many instructors who would answer "No" to this question. I think the reasoning is that we are teaching at a college, and if a student doesn't have the survival skills needed in college they have two choices – develop them on their own or disappear.

I think that this approach is unfair, and perhaps slightly elitist. If a student wasn't taught in K-12 how to succeed in a mathematics class, or how to succeed in school in general, then we cannot continue to penalize them for this. It's not their fault. The same holds true for the re-entry student who has been away from school for 10+ years.

Another thing to keep in mind is that even though we are teaching at a college, many of the students are enrolled in a class considered to be a pre-collegiate course such as Prealgebra or Elementary Algebra. One of the many reasons I love teaching at a community college is because we are in a position where we can help students to start anew, to give them the tools that will change their path in life. Helping a student understand how to learn is a great first step in this journey.

General Study Skills Courses and Their Shortcomings for Math Students

At our college, many (first year) students take a general study skills course. These "Student Success" courses focus on the college's resources and programs designed to help students. The courses also offer general guidelines as to how to be a successful student. The courses are typically taught by the Counseling division. These courses can be quite helpful to students in general, but in many ways fall short in helping students to be successful in mathematics.

The set of study skills required to be successful in a math class are in many ways different than the skills needed in a history class, an English class, or an art

class. Of course, being an active listener is important to success in all of those classes, but I feel it is crucial in mathematics.

Another problem for me with the general study skills class is that many of the study skills are taught out of context. When the instructor says note cards are a great aid for memorizing facts, the students will most likely forget about this skill by the time they will be able to apply it in my class. However, when I reach the first specific instance that I feel the use of note cards would be helpful I can briefly stop the class, explain the power of using note cards, exactly what to write on the card, how to make use of the cards, and so on. This is a skill that my students will now understand and incorporate them into their general strategy. Later in the semester all I have to say is “This is a note card moment” and my students know what to do.

Teaching the study skills within the framework of a math class helps students to understand the current material while also adding to their study skill toolbox.

Study Skills That I Cover

I have a list of 12 study skills that I cover in my developmental math classes.

- Note Taking
- Doing Homework Effectively
- Reading a Math Text
- Creating Note Cards
- Test Preparation
- Practice Quizzes
- Test Taking
- Test Analysis
- Time Management
- Study Groups
- Math Anxiety
- Learning Styles

Three Essential Elements for Every Study Skill

Every study skill that I teach must address the following three elements.

- How do we do it?
Obviously I have to show them how to apply or incorporate each study skill. I also have to discuss when to apply the skill and under which circumstances to apply the skill.
- Why do we do it?
Students need to know why each skill is important, and what benefits come from applying the skill. If they don't know why each skill is important, they won't see why they need to incorporate that skill into their routine. If you don't explain the benefits associated with a particular study skill, they will assume there are none.
- Encourage them to do it.
To get students started, you must encourage them to use the study skills.

That includes suggesting when to use a particular study skill – read through the next section of the textbook before tomorrow's class, create a set of note cards for problems that you find to be difficult, create a practice quiz that covers today's material, ... You also have to remind them of the benefits – by going over your mistakes on last night's homework you'll increase your chances of getting a similar problem correct on the exam.

How do I cover study skills and still cover all of the material in the course outline?

It's possible! I incorporate study skills into my mathematics lectures. My preference is to talk about study skills within the flow of the daily lectures. I have designed short in-class activities that I can use. I try to keep the time commitment to 10 or less minutes. I have also developed a series of assignments that can be completed outside of class.

The remainder of the talk is devoted to a discussion of specific activities and assignments. These are available on my web site – georgewoodbury.com – under the Presentations tab.