

Declining STEM Enrollment May Impact Faculty Numbers


A shocking revelation at the University of West Virginia sent chills to many colleges and universities across the nation. Based on declining enrollment in math degree programs and other factors, the school has decided to cut faculty, reduce class offerings, and discontinue the doctoral program in math (See the Program Review Report [here](#)).

While this may not be happening at your school yet, the writing is on the wall. Many of the declines in math enrollment began years before the pandemic, the Covid lockdowns have created an even more evident decline, not only in enrollment in mathematical sciences, but in the academic level of entering freshmen, especially in math and in ineffective approaches to learning.

Join with us to improve student outcomes at your school. When students learn how to learn math, they can learn anything!



How to help students “Do it Now”

Discussion Ideas for  your students

Most of us are experts at procrastination. We all know what it looks like. We avoid pain, misery, fear, or any other disliked task while knowing it is keeping you from desired goals. Students are notoriously good at procrastination. Procrastination causes stress, discouragement, low self-esteem, poor health, clutter, and in the case of your students, cramming, late nights, lack of sleep, and low grades.

Below are a few ideas for structuring your class to minimize your students' procrastination.

Frequent Assessments: When assessments are spaced far apart, students have more of a tendency to put off study because they will “do it later.” A short daily quiz can improve the urgency in your students to keep up with current content.

Project Milestones: To keep group projects on track, set due dates for parts of major projects before the final project is due. “Chunking” a project is a new idea for many students, and they can benefit from learning the technique.

Talk about it: Share with your students some of your techniques for avoiding procrastination. Solicit ideas from other students as well. Ask them to apply some new ideas to other areas of their lives where “doing it now” would be valuable. You can find some ideas for class discussion or individual counseling in the column on the right side of the page.

Way to Succeed
Mindful Insights for Learning



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Acknowledging procrastination is one step in the right direction for overcoming its influence. Here are some thoughts you can discuss with your students to help them reduce their avoidance behaviors.

Pay attention to what you are thinking about and how you rationalize these thoughts when you begin to avoid a task. Look for patterns, fears, and distractions.

Plan your time. Use a calendar to block out your class times and sufficient time to study. Then stick to your plan!

Limit visitors. Don't allow others to interfere with your planned work time.

Don't overschedule. Do allow some time for sleep, family, friends, and fun.

Chunk. Break a big project into smaller chunks or steps. Work on one step at a time.

Start now! Getting started is the hardest part. Set the beginning of the task as your goal and accomplish that. It is easier to continue with the rest when the you have begun the task.

Time yourself. Set a timer for 25 minutes to work on a portion of your task. Then stop and take a break for 5 minutes. Do it again.

Plan your day. Write your plan and a check-list of things you need to get done. It's satisfying to mark things off the list.

Incentivize. Think of how you can reward yourself when you complete your task. Then do it.

Begin with the end. Remind yourself of your medium- and long-term goals of completing your task.

Imagine the consequences. Think ahead to what would happen if you did or didn't complete your task. Knowing potential consequences can be a motivator for action.

Molly Fletcher cited 10 characteristics of success that have little to do with background, course preparation, or intelligence. Your students would benefit from incorporating these into their approach to learning in college. These characteristics are representative of the types of things successful students in the Anthony (2000) study cited as factors for success. Make sure your students are aware that anyone can do all of these things regardless of background or talent. They are listed here below and modified to reflect learning in a college course.

1. Being at work/practice/class before time
2. Having a good work ethic
3. Putting in sufficient effort
4. Portraying a positive body language (interest, attentiveness)
5. Generating energy when you are learning
6. Having a positive attitude
7. Bringing passion to your education
8. Being coachable (listening and applying knowledge)
9. Doing extra
10. Being prepared (for class and for tests)

<https://mollyfletcher.com/zero-talent/>



Student factors relating to success and failure is often overlooked when looking to improve learning at the college level. Administrators and coordinators look for improved achievement through changing curriculum, standards, pedagogy, textbook selection (or deselection). Yet what the student brings to the learning environment may often be considered more important than these “top-down” modifications. What seems to make a great difference between success and failure are the approaches and attitudes of the students. Anthony (2000) conducted a qualitative study about student factors associated with success and failure in a first-year mathematics course.

Her findings focused on perspectives of 1) successful and 2) unsuccessful students and 3) their instructors. Interestingly, these three groups had dissimilar perceptions of what resulted in math course success. Successful students cited reasons for success more on factors they controlled themselves (attendance, assignment completion, persistence) whereas unsuccessful students perceived success was more based on supply of information such as lectures, note structure, communication, and help booklets which were factors out of the control of the unsuccessful students.

Instructors cited reasons for success more on factors related to previous course preparation, such as high school background and intelligence, which were impossible to change once students were enrolled in each class. Instructors also touched on insufficient work, and poor study techniques with the lower-achieving students. The instructors reported that organizational issues and pedagogy also influenced success.

Factors of Success and Failure How to improve success in your classroom

An instructor can do little, if anything, to improve student intelligence or prior background once students enroll in a class. However, students and instructors can be informed about understanding what success looks like in the first-year college math or other STEM class and how students can achieve it. Even though the Anthony study is relatively old, it still holds valuable insights about perceptions of learning behaviors. Each group in the study held some truth about factors associated with success and failure, but successful students have found learning behaviors that are effective, regardless of instructor, lesson style, or pedagogy. While the instructors' perspectives are valuable for course placement, only student work level, attitudes, and study techniques can be improved once a student enrolls in a class.

Anthony, G. (2000). Factors Influencing First-Year Students' Success in Mathematics. *International Journal of Mathematical Education in Science and Technology*, 31(1), 3–14.

Way to Succeed Can Help!

We designed Way to Succeed to accompany first-year math and other STEM classes. Our goal is to help your students become aware of and develop their learning skills and strategies in a personal way while freeing you to focus on your math or other STEM content. The online program works concurrently with your class, providing students with personal learning profiles and targeted actions for improvement, short, thought-provoking readings, videos, and short quizzes that highlight the skills, attitudes, cognitions, and learning strategies in which successful students engage. Student can quickly make changes to become better learners and improve their academic achievement.

The Working Memory and Math Anxiety Connection

In the last issue of *Learning Insights*, we pointed out that problem-solving is supported by at least three components of working memory. Working memory is roughly defined as the cognitive processes of recall, reasoning, and comprehending new information while working on any challenge or obstacle such as a math problem. Working memory has a limited capacity. Any disruption to one of the three components of working memory can result in anxiety for the problem-solver, overloading the remaining components and freezing progress toward a solution.

For example, calculations have a negative effect on working memory because of the mental “time-out” students must take to come up with what should be rote memory facts. Students lose focus on the problem at hand. Lower numeracy skills are related to anxiety and both interfere with reasoning (Skagerlund, et al, 2019). Students tend to avoid that which makes them anxious, and do not tend to work at improving their comfort level with mathematics. Therefore, math anxiety can be difficult to overcome and may actually increase over time, as remedies to the anxiety, things that increase

math anxiety can be difficult to overcome and may actually increase over time, as remedies to the anxiety, things that increase comfort and familiarity with the subject, are avoided.

Students with math anxiety struggle with many internal patterns of thought that interfere with performing mathematical processes. This interaction with mathematical content is complicated, and is different for each student. However, we can separate out some common threads that contribute to this phenomenon with the purpose of alleviating some of the anxiety when solving mathematical problems and learning new math concepts.

Math anxiety in particular is thought to be a learned response to negative past experiences in math. By the time college-age student arrive in your class with math anxiety, the anxiousness is often well established and difficult to mitigate. However, as with any unusual fear, shining a light on the causes is helpful. Once students understand *why* they are anxious about math, they can begin to rethink their anxious responses and work to reduce the negative effects of math anxiety.



In Chapter 4 of our student edition of “Find Your Way to Succeed,” we have outlined ten major causes of math anxiety and how students can overcome each cause. Perhaps your students will see themselves in the examples presented and would benefit from understanding their own issues with fears about math. Relieving some of students’ math anxiety will strengthen their confidence, and will increase opportunities for future educational and career goals.

Skagerlund, K., × Rickard Östergren, Västfjäll, D., & Träff, U. (2019). How does mathematics anxiety impair mathematical abilities? Investigating the link between math anxiety, working memory, and number processing. *PLoS One*, 14(1)<https://doi.org/10.1371/journal.pone.0211283>

Q&A About Way to Succeed

Q: I have a lot to do. What am I required to do, and is it worth the effort?

A: We understand that you are busy! That’s why we designed Way to Succeed to be almost **effortless** for instructors to use, putting the “work” of the mini-course in the hands of the students. All you need to do is set due dates for the 10 weekly assignments in your LMS/syllabus and Way to Succeed does the rest! We automatically grade student quizzes and score learning profiles, make



recommendations for students, and record all these in your Instructor Interface.

The data from your students are yours. You also will have feedback from your students about how they benefitted from using Way to Succeed. Students reported using learning principles acquired through Way to Succeed in their STEM class and other classes as well! Eighty-two percent of fall semester students would recommend Way to Succeed to other first-year STEM students.

QUOTE OF THE MONTH

“Action expresses priorities”

Mahatma Gandhi





Visit our Website

We offer a unique research-supported approach to helping students become more independent and successful in your classes.

Visit [Way to Succeed](#) for more information about our product, pricing, and how to order.

You can be ready for Fall Semester 2024 classes!

First-year, at-risk, and probationary students typically need more support than most other returning students, especially when these students enroll in online classes. [Way to Succeed](#) can help you to assist your students with a personalized, stand-alone success program designed for mathematics and other STEM courses. [Way to Succeed](#) helps students develop their own self-regulating and metacognitive skills so they can become more independent and effective learners.

- Students learn how to learn, especially in their math or STEM class.
- Our focus is on improving self-regulation, time-management skills, metacognition in your students, and how to access extra help resources.
- Nothing to grade. Nothing to plan. No essays for your students.
- Personalized learning diagnostics and recommendations for each student.
- Companion eBook for better student accountability.
- Research-based process with significant improvement in grades.
- Low department and per-student costs.
- Compatible with any STEM text or curriculum, online or face-to-face.
- Easy-to-access instructor reports.
- **Quick and easy set-up for your school, by department, course, or class.**

Upcoming Articles in the next issue of *Learning Insights*

1. Critical Early Intervention for Low-Achieving Students
2. Lowering Standards and Grade Inflation: Two Sides of the Same Coin
....and more!

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