

Helping Students Get Past Math Anxiety

MATH ANXIETY CAN BEGIN AS EARLY AS THE FOURTH GRADE AND PEAKS IN MIDDLE SCHOOL AND HIGH SCHOOL. IT CAN BE CAUSED BY PAST CLASSROOM EXPERIENCES, PARENTAL INFLUENCES, AND REMEMBERING POOR PAST MATH PERFORMANCE.

SEVENTY-FIVE PERCENT OF AMERICANS STOP studying math before they have completed the educational requirements for their career or job, according to the National Research Council. Math anxiety may pose a significant concern for high school career and technical education (CTE) students because many students who suffer from math anxiety have little confidence in their ability to do math, and tend to take the minimum number of required math courses; this greatly limits their career choice options.

Research shows that students who have high levels of math anxiety, have lower levels of math achievement and may be less likely to pursue math courses or math-related careers. Therefore the amount of math taken in high school can determine a student's range of career options; if the student does not take algebra in high school, access to higher-level math and science courses will be denied. So their career options will be limited since algebra is a prerequisite for many other math or science courses. Since many CTE students dislike academic subjects such as math, they tend to be less prepared in the number and level of math courses taken than the college-bound student, research shows.

Math anxiety can begin as early as the fourth grade and peaks in middle school and high school. It can be caused by past classroom experiences, parental influences, and remembering poor past math performance. Many students who lack the confidence in their ability to do math may leave high school feeling apprehensive about doing simple mathematical tasks.

By the 10th grade many students stop taking math. Since math is a requirement for a wide range of college majors and occupations,

math anxiety can, both directly and indirectly, influence the choice of math-related majors and careers. It is important that math anxiety be identified as early as possible to lessen its effect on course and career choice.

The High School CTE Student

A major developmental task of adolescence is career planning and occupational identity, and CTE students have unique career decision-making patterns. The content of the high school college preparatory curriculum is quite different from that of the high school CTE curriculum. And students often pursue one curriculum or the other based on their career interests.

Some students choose CTE as a consequence of many years of unsuccessful academic classroom experience, which has persuaded them not to aspire to college. To many CTE students, the learning environment of career and technical classes is more comfortable than the typical academic classroom.

Research shows that these students may not like academic subjects, may have performed poorly in them, and may have developed self-perceptions that they should avoid occupations that require college. This could be a contributing factor in high school CTE students being less prepared in the number and level of math courses taken.

Adolescents are constantly revising their beliefs about their ability to be successful in school through a continuous re-evaluation of successes and failures. Since this process is fluid throughout adolescence until late adolescence or early adulthood, unsuccessful experiences with math during adolescence may cause the student to doubt his or her ability to do well in math or in careers requiring math. Math anxiety can be a contributing

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factor in the student not wanting to pursue math-related courses or careers.

Parental Influence on Math Anxiety and Career Choice

Parents have the most influence on adolescent course-taking and career choices, with the mother being the most influential of all; this was the finding in a 2001 report in the *Social Psychology of Education*. Parental encouragement in math has been found to significantly influence students' learning experiences and attitude toward math. In fact, students' grades in math were higher when students perceived that their parents were encouraging their effort in math.

Student belief in their ability to be successful in a career may also be improved through strong parental support of the student's career choice. High school students do discuss their occupational career plans with their parents—who play an im-

portant role in their students' career plans. For example, if students in the eighth grade perceive their parents have a positive attitude toward science, they are more likely to maintain interest in a science or technology career. Research shows that science majors in college have more parental influence in their career planning than other students.

Parents play an important role in supporting their children's course-taking and career choices. They can lessen the effect of math anxiety in students, and encourage them to pursue challenging courses and careers. Throughout high school, it is important that parents support and encourage their children to take challenging courses so that they will be prepared for the widest variety of careers.

What Can Teachers Do?

Teachers too should be aware that students may suffer from math anxiety, and they

should employ effective teaching methodologies to lessen math anxiety in their classroom. Teachers are a key element in reducing math anxiety and encouraging students to pursue challenging courses; those teachers who do not use effective instructional practices will find their students falling further behind in their learning when compared to students who have been taught with effective instructional practices.

It is during adolescence that decisions are made concerning which educational course and career path to follow. These decisions have a far reaching affect on one's life and career.

Math anxiety can cause students to avoid challenging math courses and may limit their career choices. It is important for teachers, parents and students to be aware of the effects of math anxiety so that if a student is affected, the student can receive the support necessary to lessen or eliminate it. ■

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