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AUTHOR Taylor, Lyn; Brooks, Kathryn
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ABSTRACT

Unfortunately, many students have negative feelings toward mathematics that can lead to math anxiety and subsequent poor performance in or avoidance of mathematics classes. These feelings may have been brought about by negative math classroom experiences, negative parental attitudes toward math, or societal stereotyping of mathematics. The notions that math (1) is a male domain and (2) requires logic, not intuition, are both myths. The learning of mathematics is a developmental process that takes time and practice. Negative attitudes toward or anxiety over mathematics can be altered by establishing a supportive classroom environment, using concrete manipulative materials to help bridge the gap between concrete learning and abstract thought, using a variety of teaching techniques, and addressing the student's personal attitudes toward math. (This guide includes a worksheet that is intended to assist students in confronting their math anxiety. It contains information on how to take charge of one's own study, classroom, and test environments; create success; and distinguish the facts about learning math from the myths.) (MN)

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TECHNIQUES

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Conducting Group Discussions With Adult Basic Learners

by Jean H. Lowe, Fairfax County (VA) Public Schools

Group discussions can be very effective in building a sense of community in any ABE classroom or learning center even when students are working at different levels and especially when they come from different cultural backgrounds. Since increasing students' familiarity with their fellow learners seems to lead to better attendance and persistence, group discussions in ABE classes and learning centers are well worth the effort. They can generate conversation, encourage participation, and create an accepting environment where sharing experiences and ideas feels safe to all participants. Discussions are also a good way to increase mutual understanding while learning and having fun at the same time.

If neither you nor your students are experienced in group discussions, you will want to start simply with non-controversial content of general interest relating to a common experience. What would be a good beginning topic to elicit participation without the risk of negative or judgmental comments which might be discouraging to insecure learners? If your students represent different age groups, educational levels, or ethnic backgrounds, you might begin with certain memories from childhood. Memories about foods can be a good choice—especially foods like bread and soup which are common to all cultures. Students can describe smells and rituals—the anticipation of a special meal. Another possibility is to exchange memories about holidays involving children. It is surprising how sharing of this kind reveals the common and positive elements of human development. And shared experiences in these contexts tend to build a sense of community among learners with different backgrounds and to stimulate conversation along the lines of "Oh, really. Let me tell you what we did."

Here are a few specific guidelines for developing and improving group discussions.

1. As you begin this activity, choose upbeat topics which everyone can share.
2. Encourage everyone to contribute. While you don't want to force extremely shy students to talk, you do want to make it clear from the beginning that everyone has something important to offer. (The value of starting with personal reminiscences is that everyone has an experience as important and interesting as anyone else's. Since there are no experts or authorities, no one need be self-conscious or reluctant to participate.)
3. Initially, limit the amount of self-disclosure required. (Some students will find any group discussion threatening. Asking them to reveal intimate details of their personal lives may increase their feelings of insecurity.)
4. Monitor the kinds of comments students make about each others' contributions. Comments such as, "That's what happened to me, too" are positive. Critical remarks should be discouraged.
5. While you are encouraging input from all of your learners, be sure to keep the more vocal students from dominating the discussion.

Once you have had some experience with your group, you may want to change the focus of your class discussions to include additional topics such as, for example, a current news item or a popular TV show. Again, there are some guidelines to keep in mind. Be sure to encourage everyone to join in and accept without judgment all the opinions that are expressed by others. Try to avoid expressing your own viewpoints since so many students see the teacher as an ultimate authority. Your role in class discussions

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on math achievement reported significant differences between males and females. Recently, these differences have been explained; males scored higher than females on many achievement tests because they had studied more math. Yet, today many women are pursuing mathematics and careers which rely on mathematics. When females have the same math background as males, there is no difference in their achievement.

In today's highly technological society, a knowledge of mathematics is crucial. Fear and/or avoidance of mathematics can severely limit ones career options. Significantly, most of the higher paying jobs require a knowledge of mathematics.

The statement that *math requires logic, not intuition* is also a myth. It is important to use both intuition and logic in mathematics. Intuition, which is knowledge that comes to a person through insight, has played a role in many great discoveries. Intuition is creative and helps in approaching problems from another frame of reference. Many times there are a number of ways to do a problem. The "best way" is that which the student understands and which makes sense to that individual.

Learning mathematics is a DEVELOPMENTAL PROCESS which takes time and practice. Memorization is a coping skill which is sometimes used as a learning aid. Once students really understand something, they have learned it and not just memorized it.

Working tensely until problems are solved is not advisable. Students should try to relax with mathematics and give themselves a chance to succeed. Sometimes just putting it away for a while is the best strategy to use when having difficulty. Students should not be allowed to build up anxiety. Instead, they should be encouraged to ask a friend, tutor, or instructor for help in understanding the problem.

To deal with math anxiety, students may find it helpful to look at their own personal math life history. What experiences have they had with mathematics? How have these experiences affected them? The key which should be stressed is for students to get to know (a) themselves, (b) how they learn best, and (c) how to create their own success experiences. By giving themselves time to learn math, students can take charge of their lives and benefit from math learning. Approaching math as an interesting subject, looking for patterns, exploring the natural beauty of geometrical shapes, and allowing the self-expression of feelings can help students to succeed with math.

BUILDING MATH CONFIDENCE

What feelings and thoughts does the word *mathematics* bring to mind for you? How would you answer the question, "If I knew math, I would" Listed here are various strategies for reducing your math anxiety in order for you to begin to build your confidence in mathematics and related fields.

Take Charge of Your Environment

Study environment. Create a study environment which is comfortable for you. Get to know yourself. Do you study best in total silence or with music? Do you study best in familiar surroundings or in a place like the library? Do you have a problem in making sure that others understand and respect your need for time to study, for a place to study, and for freedom from interruption? Do you need to break old study patterns and establish new ones?

Classroom environment. What type of classroom environment is best for you? Do you prefer a large or a small class? Do you need to sit near the teacher to be on top of the work, or do you need to hide in a less visible spot?

Test environment. What happens to you while taking a test? Do you need to change your seat to prevent being sidetracked by those who finish and leave early? Can you sit in a place where you can do relaxation techniques without bothering others? Are you aware of the effects of caffeine, sugar, and heavy foods on your performance?



Create Success

We know from common sense and our experiences that success creates success. Additionally, this is verified by research. Examine your messages about success to learn how YOU measure success. Here are some suggestions for creating your successful experiences.

1. Think about how you are most comfortable learning? Do you learn best by listening to a lecture, by reading and studying alone, or by interacting with people and materials?
2. Explore a variety of approaches to determine how you learn best. Experiment with learning in different ways such as in study groups, by individual study, with a tutor, or by working with manipulative materials.
3. Once you know how you learn best, pick a class that meets your learning style.
4. Start with both classes and materials that meet your learning level. This will enable you to begin to build your confidence for understanding the basics of math.
5. Allow yourself time to learn and study mathematics. Learning mathematics is a developmental PROCESS which takes TIME.
6. Begin to think about how valuable math is in your life. It is important for career options, consumer issues, and feelings of comfort around financial matters. People who believe that math will be useful in their lives tend to have higher achievement in mathematics and to enjoy math more.

Do You Believe?

We often let our ideas about math and mathematicians block our learning process. How do you feel about each of the following statements?

1. Math requires logic, not intuition.
2. Some people have a math mind, and others do not.
3. There are magic keys to doing math.
4. It is bad to count on your fingers.
5. Math is not creative.
6. Math requires lots of memorization.
7. Most people do not have to know math to succeed in their daily living.
8. In doing math, it is important to get the answer exactly right.
9. Math problems are done by working constantly until the problem is solved.
10. There is always a best way to do a math problem.