

Faculty Development Panel Discussion  
Abstracts

AMATYC Conference  
November 2002

Web site: [amatycdev.org/abstracts.pdf](http://amatycdev.org/abstracts.pdf)

# Tutorial

## **Tools of the Trade: Linking Problem-Solving To Math Applications**

**Description:** "Oh NO, not story problems," a familiar lament heard often in math classrooms and learning centers. The ability to transfer problem-solving strategies and skills from instructors and tutors to students in large classrooms and tutoring centers has always posed a special challenge for those involved. This presentation uses the idea of a construction company and construction tools to emphasize the building blocks for forming the foundations to support mathematical problem-solving. The goal is to construct the four steps in Polya's plan to solve word problems with more confidence.

The construction tools that help build problem-solving skills are as follows:

1) Patience, like the blueprint, provides order and timeliness to reach the end product, 2) Observation, like protective eyewear, allows one to see the details, 3) Past experiences, like the hammering of nails into boards, allows for practice to perfect one's techniques, 4) Reasoning, like a level, helps balance one's thinking, 5) Questioning, like a saw, allows one to view the components of the structure being built, and 6) Critical thinking, like the hard hat, symbolizes analysis.

Polya's four-step problem-solving process uses all of these tools. To facilitate the proper use of the tools, it becomes the job of the math instructor or tutor to ask questions that draw the student into deeper thinking. Listening goes hand in hand with the questioning. As construction supervisors, math instructors and tutors must model problem-solving. This is accomplished through questioning techniques that fit the four-step process of understanding the the plan and looking back at the final product. Probing questions that engage students help build a foundation of confidence in their own problem-solving abilities. Teachers can use these questioning techniques in lecture and assessment, while tutors can do the same when assisting students.

**Presenters:** Darlene Kahrman    dkahrman@kvcc.edu  
Aryl Clay                            aprylclay@yahoo.com

## **A DYNAMIC LEARNING CENTER MODEL**

**Description:** A student-centered learning environment that promotes alternative instructional presentation styles and accommodates diverse learning modes will be explored. This Mathematics Center empowers the teacher as content facilitator and designer of group and individual learning plans, thereby empowering students as managers of their own learning process.

A multimedia presentation will focus on the strategy at work in the daily operation of the Center by highlighting activity areas (open study, tutorial service, computer and video tutorials, self-paced classes and mentoring) and support staff (45 professionally trained student assistants and instructional associates, many of whom plan to become teachers).

In addition to print formatted multimedia frames with note-taking space, handouts will include sample description of Math Center services, courses, diagnostic test results, tutorial reference guide, instructional resources, and record-keeping report forms.

### **Professional Qualifications:**

Ms. Blair, whose master's thesis was entitled *A Model Development Math Center*, has directed the Orange Coast College Math Center for the past tens years. In that capacity she has been responsible for the design, development, and evaluation of the Center. Ms. Blair has provided consultation to ten other California community colleges in their attempts to initiate similar programs and has shared this presentation with several groups, among them The American Council for California Learning Assistance, the Secondary School Workshop for Writing across the Curriculum, and was a 1998 Master Presenter at NISOD in Austin Texas. As feedback from each program is received, Ms Blair modifies and expands her presentation to anticipate the audience's questions and incorporate those answers. In 1999 Ms. Blair was the lead author of a prealgebra book, which has been included in a successful series of four developmental books by John Tobey and Jeff Slater.

**Presenter:** Jamie Blair profjblair@yahoo.com

# Distance Learning

## **Creating and Teaching Online Mathematics Courses**

**Description:** As distance learning has expanded, so also has the use of the Internet. More and more we are seeing the expansion of course material to the Internet. What are the issues for teaching course material on the Internet? What students will benefit from such opportunities? These are some of the issues addressed in creating an online developmental mathematics course and other mathematics courses. This presentation will provide both resources and methods for teaching a course on the Internet as well as an emphasis on the new technologies becoming available.

Several online mathematics courses will be used to demonstrate some basic forms of communication and evaluation that are necessary for a course to be successful.

**Presenter:** Mary Susan Hall  
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## **Intermediate Algebra Online (Math 40)**

**Description:** College of the Desert provides a “Virtual Valley Center” at <http://desertonline.net> , which is a vehicle for offering distance learning. Among the twenty-seven courses offered is Intermediate Algebra Online (Math 40). This course has been offered for the last four years and has the same prerequisites as traditional on-campus classes. Two sections of Math 40 Online are offered each semester with a maximum of 35 students enrolled in each course. This course has become very popular for students with life-styles that don't allow them to attend classes on campus.

The course makes use of the Prentice Hall Interactive Math software and course management system. Interactive Math software allows the online environment to be both sophisticated and user friendly for students and easy to manage for the instructor.

Learn more about this Math Anxiety Reduction course at the workshop presented by Professor Tabor-Regis at the upcoming AMATYC November conference.

**Presenter:** Karen Tabor [karentabor@earthlink.net](mailto:karentabor@earthlink.net)  
Professor of Mathematics  
College of the Desert

# Technology

## **NKATE ALGEBRA PROJECT**

**Description:** Examples of the use of calculator technology will be used to show how to increase understanding, to reinforce topics, and to replace tedious manipulations. The graphing calculator allows students to graph functions quickly so they can focus on understanding concepts rather than concentrating on manipulative skills. Calculator Based Laboratory (CBL) experiments will be used to generate and analyze data describing real world situations. A discussion on the appropriate use of technology will be the culminating activity of the workshop.

**Presenters:** Dana T. Calland [Dana.Calland@kctcs.net](mailto:Dana.Calland@kctcs.net)  
Kathy Mowers  
Darrell H. Abney

## **Calculator Workshop**

**Description:** For several years, I have taught courses using the TI-83 Graphing Calculator. I have taught courses from Beginning Algebra to Business Calculus and Statistics. I have done workshops for students as well as faculty. If needed, I can conduct a workshop on basic calculator features. For first time calculator users, the graphing calculator can be a bit overwhelming. Teaching Order of Operations is a good topic to use when trying to get students to become familiar with the basic calculator features. Also, I can provide workshops on the graphing and statistical aspects of the TI-83. The graphing aspects of the calculator can be useful in getting students to understand the concept of slopes, lines and functions. This would lead into a good demonstration of the table and calculation features of the calculator. Finally, I can show faculty members how to use the TI-83 to perform matrix algebra, to illustrate math modeling, and to supplement the teaching of traditional mathematical concepts by using a graphing calculator.

**Presenter:** Don Brown                      dbrown@mail.maconstate.edu  
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Macon State College  
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## **Graphing Calculators**

**Description:** An important topic of concern, study, and discussion for mathematics teachers in recent years has been the use of graphing calculators in teaching. Any staff development service that I have done has been concentrated on the use of graphing calculators in mathematics classrooms. It is my belief that students in classes using graphing calculators demonstrate a greater understanding of topics being taught and a more positive attitude toward mathematics because of the “hands-on” use of graphing calculators. I teach a lot of algebra, and in my classes, along with teaching algebra, I teach my students to learn to use a graphing calculator, to learn to think logically about algebraic concepts, and to solve practical problems. I have done many conference presentations on use of graphing calculators such as the TI-83 in math classes. I also have attended many presentations on the same topic in an effort to learn more about use of calculators in mathematics classes. Perhaps one of the most serious issues still under discussion regarding the graphing calculator is how to test students effectively and be sure students are not academically dishonest. Some teachers have said they have a special set of calculators that students use during test taking, but that could be expensive. Other teachers have said they check students’ calculators prior to tests, but that is rather time-consuming. Perhaps the best solution is to carefully phrase test questions so that the calculator is an enhancing tool, not a new method for cheating. That’s what I endeavor to do.

**Presenter:** Donna Saye  
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## **Algebra Curriculum With Graphing Calculators**

**Description:** The use of graphing calculators has changed the environment of the developmental mathematics classroom. However, many mathematics faculty members are asking, "Is the calculator driving the content of the course or is the content of the course driving the use of graphing calculators?" Upon reflecting on ten years of teaching elementary and intermediate algebra using a graphing calculator, the answer to this question is yes to both parts.

The next question then arises, "What calculator skills are needed to support the content of these courses, and what additional content is needed to support the use of graphing calculators?" A careful analysis of the required course content, goals for student outcomes, and instructional strategies must be made in order to answer this question.

Possible workshops may include:

- Uses of the graphing calculator in elementary and intermediate algebra.
- Discussion of the course analysis process using your institutions' course of study.

**Presenter:** JoAnne Thomasson                      jthomasson@pstcc.edu  
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## **Staff Development Activities Mathematics Dept. Fullerton College**

**Description:** In an ongoing effort to support faculty who incorporate technology into their courses, the department sponsored a year-long series of workshops dealing with both the “how and why” behind the incorporation of graphing calculators into our curriculum; along with specific sessions on how to develop effective classroom presentations. One such session early in the year, focused on the TI-83+, and was designed for the more “reluctant faculty”. The session began with an overview of TI products, as individuals were walked through the Texas Instrument website. Next, faculty viewed a TI-83 instructional video, which we make available in our Math Tutoring Center to all students enrolled in classes where the calculator is required. Then faculty presented short mini-lessons from specific areas in the curriculum, (such as how to graph absolute value equations in Intermediate Algebra, how perform linear regression in College Algebra, or how to approximate areas under curves using upper and lower sums in Calculus.) Finally faculty discussed key issues relating to the incorporation of technology. These sessions not only served to introduce faculty to the benefits of the graphing calculator, but they highlighted the positive features of using the calculator as an integral part of the classroom experience. In using colleagues as presenters for these workshops (instead of outside presenters) there was much more interaction and conversation since everyone was facing similar issues in the classroom. Finally the presenters provided concrete examples that faculty could use in their own classes, and the session wrapped up with a discussion of key implementation issues. Throughout the year we continued this important dialog, and a Technology Committee is a standing committee of our division.

**Presenter:** Mark Greenhalgh                      mgreenhalgh@fullcoll.edu  
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## Using the Calculator to Help Students Learn Mathematics

**Description:** The graphing calculator is an excellent tool for helping students discover, understand, and remember mathematical concepts. With a graphing calculator, a student can explore literally hundreds of graphs which were unattainable when graphing by hand. You can use this tool to help your students reach the depth of mathematical understanding you would like them to have. Choose from 1/2-day to 5-day workshops.

Bill Thomas has facilitated hundreds of workshops on these and other teaching and learning concepts. Bill helped formulate and write the *Crossroads*. He directed the AMATYC Traveling the Crossroads and Traveling Technology Workshops. Mr. Thomas was the breakfast speaker at the 1999 AMATYC Conference in Pittsburgh. Bill is currently teaching mathematics at the University of Toledo. Contact Bill at the following information to set up a workshop to meet your needs:

**Presenter:** William N. (Bill) Thomas Jr. [bill@teachingforlearning.com](mailto:bill@teachingforlearning.com)  
P.O. Box 4644  
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## Technology Workshops

**Description:** The following are possible workshops that are available.

Using a function approach to the teaching of developmental algebra. This is an eight-hour classroom implementation module for adopting a function approach to teaching developmental algebra. Requires a TI-83 Plus. A CBL2 and CBR are optional.

Customized professional development on the proper and appropriate use of graphing calculators and data collection devices for enhancing teaching and learning in the remedial or developmental algebra classroom. Requires a TI-83 Plus, CBL2 and CBR.

Application software on the TI-83 Plus graphing calculator. Apps include the transformation app, study card app, the inequality app, cell sheet app, and limited features of the algebra I app. SMG app on the Voyage 200 can be included.

Provide developmental algebra faculty with student-centered teaching activities on mathematical concepts and skills through guided discovery. Requires the TI-83 Plus graphing calculator, CBL2, and CBR.

### Professional Qualifications:

Ed has taught developmental algebra with a graphing calculator since 1990, and has teaching experience at a two-year college for 24 years. He is currently the director of the AMATYC Outer Banks Summer Institute "Developmental Algebra Using a Function Approach." Ed is also the director of the Ohio Early College Mathematics Placement Testing Program. He has given numerous talks at national and international conferences on developmental algebra as well as having taught short courses at several colleges in the US through the Teachers Teaching with Technology College Short Course Program based at The Ohio State University. Ed has published three articles in the *AMATYC Review* on developmental mathematics topics.

### Presenter:

Edward D. Laughbaum      [elaughba@math.ohio-state.edu](mailto:elaughba@math.ohio-state.edu)  
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## **AMATYC Traveling Workshops**

**Description: Traveling Technology Workshops** offer hands-on workshops using current technology for undergraduate mathematics instruction. Workshop presenters stress the application of the technology to instruction in undergraduate mathematics courses. Sample classroom materials and bibliographies are presented at each workshop. Our instructors can train your faculty to teach with:

- Graphing Calculators
- Maple
- MathCAD
- *Mathematica*
- Converge
- DERIVE
- MINITAB
- LiveMath

**Contact:** Doug Mace

# Teaching Strategies

## Changing Curriculum to Make Connections

**Description:** Over the past ten years, the reform movement in mathematics has emphasized the use of technology, collaborative learning and contextual problem solving in an attempt to increase student achievement in preparation for subsequent courses and /or the workplace. The rapid advancement in computer-related technology has had an obvious affect in the classroom. Students regularly use calculators as problem solving tools. Engaging students in collaborative learning and contextual problem solving activities enables them to become active participants in the learning process while providing them with a rich problem-solving environment. Has it worked? Are students stronger mathematically? Are we producing proactive learners?

Many college faculty have adapted collaborative learning in their classrooms; most have used technology in some form, but few faculty have made the change to the contextual problem solving approach. Our traditional curriculum is a “mile wide and an inch deep”. Changing curriculum to incorporate a problem solving approach will involve shifting the order of some topics to make connections and eliminating other topics to allow time for students to discover and problem-solve. Because of the different philosophies of faculty within the department, changing to a problem solving approach will not be an easy task.

The presenter will address reform versus traditional teaching with a special focus on curriculum. Topics in mathematics have been taught in isolation. There is not only a need to connect topics within mathematics, but also to connect these topics to the real world. Will students make these connections? Is there a reason for students to learn mathematics? How do skills factor into the whole scheme? The presenter will share her successes, frustrations and challenges, and engage the audience in a discussion of their experiences related to curriculum change.

**Presenter:** Carolyn Curley            curley@ecc.edu  
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## **NKATE ALGEBRA PROJECT**

**Description:** Workshops will focus on how project materials and teaching methods encourage students to become actively involved in learning mathematics through real world problem solving activities and collaborative learning strategies. Examples of curricular topics from Elementary and Intermediate Algebra will be used to illustrate realistic applications.

**Presenters:** Dana T. Calland [Dana.Calland@kctcs.net](mailto:Dana.Calland@kctcs.net)  
Kathy Moweres  
Darrell H. Abney

## Faculty Development Workshops

\*How to implement the 7 Principles of Good Undergraduate Education- A highly interactive workshop.

\*Everything you always wanted to know about student centered learning/teaching.

\*The synergy of student centered cooperative learning/teaching and (WAC).

\*Writing in math courses- what the heck do you write about?

\*Using cooperative learning techniques for alternative student assessing.

\*Any combination of the above

**Description:** Workshops are tailor made for each institution's specific needs or interests based upon the topics listed above. Workshops are generally a minimum of 2 hours in order to incorporate hands on activities and may follow half day, full day formats, or more if desired for faculty or staff retreats etc.

For a complete list of workshops and consulting projects previously given by Ted Panitz please visit:

<http://home.capecod.net/~tpanitz/resume.htm>

**Presenter:** Ted Panitz      [tpanitz@capecod.net](mailto:tpanitz@capecod.net)  
(508)-362-2131ext.4421

## **Mathematical Connections In Developmental Algebra**

**Description:** "When will I ever use this math?" Have you ever heard this question in your class when teaching mathematics? NADE addresses this student concern in one of its goals, stating that developmental mathematics should "develop in each learner the skills and attitudes necessary for the attainment of academic career and life goals." This question is also addressed by AMATYC in The Crossroads in Mathematics, Standards for Introductory College Mathematics, (Standard for Pedagogy, P-3): "Mathematics faculty will actively involve students in meaningful mathematics problems that build upon their experiences, focus on broad mathematical themes, and build connections within branches of mathematics and between mathematics and other disciplines so that students will view mathematics as a connected whole relevant to their lives." This workshop will help you answer this student's question.

In response to the challenges of NADE and AMATYC, the presenter's institution encourages the use of realistic examples and exercises. The presenter has researched topics of interest for the students in order to write realistic real-world exercises and projects on a developmental algebra level. After using these exercises and projects the presenter and other faculty have found that they no longer need to answer the question of relevance because the question no longer arises.

The use of realistic examples and exercises as well as projects in lieu of the more traditional non real-life exercises in the algebra classroom illustrates examples of mathematics that occur in the students' lives. This workshop will present examples of exercises and projects that may be used in the developmental algebra classroom as well as how to develop such exercises for other algebraic topics.

**Presenter:** JoAnne Thomasson                      jthomasson@pstcc.edu  
Pellissippi State Technical Community College  
(865)694-6694

## **Building Success on the Foundation of Failure**

**Description:** Teaching Developmental Mathematics successfully requires that you understand that in most cases these students were taught algebra 2 or 3 times previously and yet they failed to learn it successfully. After years of frustration and failure in mathematics how do you give hope to a student who feels hopeless?

### **SEVEN PRINCIPLES TO BUILD SUCCESS FOR DEVELOPMENTAL MATHEMATICS STUDENTS.**

1. Students need to come to terms with a negative emotional baggage from the past and to build a fresh foundation if they are to succeed in developmental mathematics.
2. Most students see algebra as a disconnected bunch of illogical rules with no relevance to the real world. You need to over emphasize connections and relevance to overcome this.
3. Some students will stubbornly resist the way you are doing the problem if they think they know another way. You need to explain the variety of methods and evaluate them.
4. Assume that almost all of your students come to class with math anxiety, a dislike of mathematics, and a very real effort to avoid mathematics in everyday life.
5. Developmental mathematics students need hope. They need heroes. They need to know they can succeed in this class.
6. Developmental mathematics students learn best if they can explain the procedures of math in their own words.
7. The most powerful tool for learning algebra is sheer repetition of a type of problem until it is understood and mastered.

I teach workshops to help faculty integrate these Seven Principles into their course, their testing procedures, and their daily class sessions. I help them evaluate their course philosophy and content to see if deals with the emotional and educational learning needs of the students.

**Presenter:** John Tobey                      [johntobey@aol.com](mailto:johntobey@aol.com)  
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## Cutting the Curriculum

**Description:** It's time we tackled the tough question. Almost every faculty member with whom I have had the pleasure of working asks the question "When am I going to have time to do this?" It is a legitimate question and one we must tackle. If the K - 12 mathematics curriculum is, as described in TIMSS, a mile wide and an inch deep, then developmental mathematics curriculum is four miles wide and a quarter of an inch deep! If we want students to learn, understand, and retain mathematics, we are going to have to decide what is important.

Need some help starting the discussion? Bill Thomas will be more than happy to help you and your faculty set a goal for your students in mathematics, identify what is important, and begin to talk about ways to help students learn the important concepts. 1/2-day, 1-day, or 2-day format? You choose.

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P.O. Box 4644  
Toledo, OH 43610  
Voice: 419.255.0490  
Fax: 419.255.4315

## Teaching for Learning

**Description:** Every teacher "covers" the material but few students understand it and fewer still remember it. Help your students learn using well established strategies. You can have a 1/2 day to a one week workshop incorporating

Writing in Mathematics

Learning Mathematics Through Projects

Inquiry-Based Mathematical Teaching and Learning

Using Group Work in Teaching and Learning Mathematics

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## **Problem Solving: What Math Students Should Learn But Don't**

**Description:** While many of the mathematical concepts we teach students go unused once they leave our classes, problem solving is one which will last them a life time. Do we really teach our students to problem solve? We can and we must. In this workshop, you will discuss Polya's problem solving method and numerous problem solving strategies. You will experience problems which will help students become expert, rather than novice, problem solvers. This workshop can be offered in a 1/2-day, 1-day, or 2-day format.

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## **AMATYC Traveling Workshops**

**Description: Traveling the *Crossroads* Workshops** provide workshops to help you and your colleagues implement ideas from the *Crossroads* in your classrooms. These are hands-on, interactive workshops based on the needs of full-time and part-time faculty at your college. Some of the topics are:

- Teaching Problem Solving
- Using Group Methods
- Assessing Student Learning
- Meshing Teaching And Learning Styles
- Evaluating Your Program
- Developing Curricula
- Building A Department Team
- Integrating Technology

**Contact:** Doug Mace

## ALGEBRA IN DEPTH: A MULTI-DIMENSIONAL APPROACH

**Description:** This is a workshop about non-traditional approaches to introductory and intermediate algebra, using electronic, manipulative, and paper-and-pencil tools. The lessons provide motivation and access without watering down the material.

- \* function diagrams: this parallel-axes representation is a pedagogical gold mine
- \* graphing calculator lessons which avoid the "what do you notice?" trap
- \* the geoboard as a springboard for understanding slope and square roots
- \* iterating linear function as an introduction to arithmetic and geometric sequences and series
- \* playful examples of groups and fields to introduce key ideas about algebraic structure
- \* quadratics for all: completing the square with manipulatives, and moving parabolas around with technology
- \* exponential and log functions, starting with dice

**Presenter:** Henri Picciotto  
<http://www.picciotto.org/math-ed>  
[math-ed@picciotto.org](mailto:math-ed@picciotto.org)

## THE LAB GEAR: A CONCRETE ENVIRONMENT FOR ALGEBRA

**Description:** This is a workshop for developmental math teachers with the creator of the Lab Gear. The Lab Gear provides a hands-on approach where the inner logic of the model replaces the memorization of seemingly arbitrary rules. Students work cooperatively, learn to communicate about mathematics, and create their own algorithms. Teachers have a new teaching tool, which facilitates communication about abstract ideas and helps improve the discourse in the algebra class.

Participants will learn to use the Lab Gear to teach about:

- \* the distributive law
- \* factoring
- \* simple polynomial division
- \* the main identities
- \* equations and inequalities
- \* signed number arithmetic
- \* perimeter patterns
- \* completing the square
- \* solving quadratic equations
- \* solving systems of linear equations
- \* connections with graphing

**Presenter:** Henri Picciotto

<http://www.picciotto.org/math-ed>  
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# Manipulatives

## **Engaging Students in the Learning Process at the Beginning/Intermediate Algebra Level**

**Description:** Interactive technologies and techniques can enhance the traditional developmental mathematics classroom. Hands-on activities, often based on contextual problem solving, encourage students to take responsibility for their own learning as they construct, reflect on, apply and describe mathematics. This “reform approach” stems from the AMATYC Standards. Activities that involve manipulatives as well as the appropriate technologies (scientific or graphing calculators) help students bridge the gap between abstraction and application. Collaboration with fellow students in the classroom fosters understanding and study skills. This workshop involves active participation by attendees in a classroom simulation.

**Presenter:** Trish Stuart                      tshuart@polk.cc.fl.us  
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# Study Skills

## Study Skills Three Examples

### **Description: Example One – Study Tips Presentation for Student-Athletes**

The Athletic Director asked me to prepare a one hour session on how to study math for the nearly 100 new freshmen student-athletes. I prepared a sample math assignment to demonstrate my seven study tips. The Athletic Director gave the homework assignment at the previous class then I spent an hour trying to demonstrate study skills through activities: the lesson plan and overhead slides are included here (Attachment A).

### **Example Two – First Day Syllabus for Math Course**

My first day syllabus is thick and color-coded but I think it is worth the time on Day One to set students up for success. The first time we do something new as part of the class – homework assignment, quiz, scrimmage, group work, test – I give even more specific details as to why this is part of the course. About half way through the semester, there is a quiz or tough assignment that most of the class will perform poorly. At that point, we form groups and students brainstorm about what made them successful previously. I collate the “success” suggestions from all groups to get them back on track for more success. (Attachment B)

### **Example Three – Actual Student Success Stories**

Over the years, as I have tried to infuse study skills into the math curriculum. These are stories of real students and how those efforts became student success stories. (Attachment C)

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# Math and Test Anxiety

## **Math and Test Anxiety**

**Description:** Many students have difficulty learning mathematics. One of the main reasons is the lack of math study skills, test-taking skills, motivation and anxiety. Bloom (1976) indicated that 25% of a student's grade can be attributed to affective characteristics such as study skills, test-taking skills, motivation and anxiety. Most students have never been taught math study skills or how to reduce their test anxiety. Research demonstrates that math study skill training either through a math study skills course or through a math lab improves achievement by at least one letter grade. On some occasions students have gone from Fs to As. Teaching students how to study and learn mathematics is one solution to improve the success rate of developmental math students.

**Presenter:** Paul Nolting  
Kimberly Nolting

## **Subduing Math Anxiety: A Cooperative Effort**

**Description:** This workshop will present techniques that help to reduce anxiety in lower level college mathematics courses. The basic premise is that stress reduction can only be effectively accomplished if the instructor acts as a catalyst. The focus is on the interaction between the instructor and the student. A developmental math course may begin with a math anxiety component. A student realizes his situation is not unique and usually feels comfortable discussing his/her own experiences. Topics such as good study habits, focusing techniques, and relaxation techniques follow quite naturally. At this point, it is important not to abruptly shift gears and "start the math part of the course." Rather this is where the instructor needs to carry over stress reduction techniques into his presentation of mathematical topics. Specific activities will be discussed and demonstrated by the active participation of workshop attendees. Typically, students who have experienced varying degrees of math anxiety also participate.

**Presenter:** Trish Shuart ([tshuart@polk.cc.fl.us](mailto:tshuart@polk.cc.fl.us))  
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## **Mathematics Anxiety**

**Descriptions:** Mathematics anxiety is prevalent on today's college campus.

Scores of

students dread taking their required mathematics courses. Likewise, faculty are at a loss when they encounter these students in their classroom. Based upon my own grant funded research, I have presented workshops for students, faculty, counselors, and administrators who desire to learn more about this very important problem which impedes successful learning. I have spoken at over twenty different conferences as well as on college campuses. In addition to mathematics conferences, my work has had wide appeal in the fields of psychology, student retention, adult learning, and counseling. Although grounded in research, my approach is "hands on." Through active audience participation, strategies designed to help students (and faculty) cope with math anxiety are considered. The session, which can vary in length from one to two hours, includes small group exercises. Resource materials to be shared with colleagues and students are distributed.

**Presenter:** Dr. Fred Peskoff, (fpeskoff@aol.com)  
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## **Math Anxiety Reduction (Math 61)**

**Description:** This course is offered at College of the Desert, a California Community College. Math 61 was created in 1995 by Associate Professor, Karen Tabor-Regis and has become a popular course offered every semester since its conception. The course targets students with low level math skills and low self-esteem. It is a non-transferrable, short-term, one unit, credit non-credit course that starts during the 4th week of the semester.

Math Anxiety Reduction (Math 61) is comprehensive and multifaceted. Topics include reduction of internal psychological stumbling blocks, confidence building, visualization, learning-style enhancement, and effective study and test-taking skills. The course is non-transferable, short-term and students receive credit/no credit grade mark.

Students are required to read two texts during the course: ***Conquering Math Anxiety*** by Cynthia Arem and ***Mastering Mathematics: How to be a Great Math Student*** by Richard Manning Smith and complete related assignments. Students are also required to take several learning inventories and the Myers/Brigg Personality Inventory. Several guest speakers are invited to discuss topics of their expertise.

Learn more about this Math Anxiety Reduction course at the workshop presented by Professor Tabor-Regis at the upcoming AMATYC November conference.

**Presenter:** Karen Tabor [karentabor@earthlink.net](mailto:karentabor@earthlink.net)  
Professor of Mathematic  
College of the Desert

## **The Mean Math Blues**

**Description:** The “Mean Math Blues,” the result of poor study skills, inadequate test-taking strategies, negative thinking, math anxiety, and learning disabilities, creates both reluctant math students and teachers. This presentation re-frames the math classroom into a supportive, dynamic environment that encourages questions, cooperative learning, hands-on experience, reinforcement, safety, and success.

Cheryl Ooten, experienced math educator and psychotherapist, has developed strategies for both teachers and students to change thinking about mathematics to involve mutual discovery of math concepts and skills. Teaching basic techniques, this workshop gives participants a model to challenge and change negative thinking and promote brain-friendly learning. Memory techniques, study skills, and test-taking strategies are included.

Since 1980, Cheryl has combined teaching math with coping with math anxiety workshops, conference presentations, and individual consultations. Her methods and experience are published in the book *Managing the Mean Math Blues* (Prentice Hall, 2003.)

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# Assessment

## Community College Collaborative to Maximize Teaching Effectiveness

**Description:** This presentation will report on a major developmental mathematics collaborative among five community colleges in Virginia carried out during a spring, 2000 sabbatical. Demographic and descriptive data—including gender, age, credit hours, enrollment, teaching method, attendance, class size, classroom participation, student success and retention rates—will be collected and analyzed to determine best scenarios for success in developmental mathematics classes.

A 1995 survey by the National Center for Education Statistics (NCES) found that 78 percent of higher educational institutions that enroll freshmen and 100 percent of public two-year institutions offered remedial courses (Institute, pp. v-vi). Twenty-nine percent, as compared to 30 percent in 1989, of first-time freshmen enrolled in at least one of these remedial courses, and freshmen were more likely to enroll in a remedial mathematics courses than in a remedial reading or writing course. In fact, a recent study of remediation by the Maryland Higher Education Commission found that for students who completed college-preparatory courses in high school and immediately attended a community college, 40 percent needed math remediation (Institute, p.8). Consistent with the commission's finding, a recent local community college study (July, 1998) showed that students taking developmental work account for over 40 percent of the graduates. Such statistics mandate needed research on developmental courses to implement changes to ensure quality programs which will adequately prepare students for college level courses.

A final concern of the Institute was that evaluation of remedial programs was minimal. Findings from their study of 116 two- and four-year colleges and universities found "that only a small percentage conducted any systematic evaluation of their remedial education programs" (p.10). Furthermore, the Southern Regional Education Board has raised the issue about the effectiveness of remedial programs by observing that "few states have exit standards for remedial courses" (Institute, p.11).

The Institute's report concludes by proposing strategies for the future—two mutually reinforcing goals (p.ix):

- (1) Reducing the need for remediation in higher education, and
- (2) Improving the effectiveness of remedial education in higher education.

This study concentrated on two charges—to improve the effectiveness of the developmental mathematics programs in higher education. The Institute's report lists three strategies to improve the effectiveness of remedial education. The first of these strategies—(c)reating interinstitutional collaboration among colleges and universities in a state or system, allowing best practices and ideas to be shared and replicated—is consistent with the charges to the 1998-99 state Developmental Studies Implementation Task Force. These charges require

systemwide collaboration for standardized test interpretation, common objectives, exit criteria, and assessment methods for developmental courses.

This research is a response, first, to the Institute's recommendation to collaborate with other college faculty for best practices and second, to the state Task Force's efforts toward standardization in the field of developmental mathematics programs in the VCCS. The specific courses under study are Arithmetic, Basic Algebra I, and Basic Algebra II. Descriptive data, including credit hours, enrollment, attendance, class size, classroom participation, and success and retention rates will be collected. In addition placement procedures for developmental courses, methods of instruction, and other anecdotal data provide further insight. Findings from this study assist in maximizing the effectiveness of teaching strategies for developmental mathematics. Recommended changes will ensure an optimal environment for student learning to take place.

**Presenter:** Pansy Waycaster (Pansy. [Waycaster@sw.vccs.edu](mailto:Waycaster@sw.vccs.edu))

## **Staff Development Activities Mathematics Dept. Fullerton College**

**Description:** While it has been shown that a move toward cooperative learning, student-centered teaching will increase student success, there has not been as much discussion of alternative assessment in the mathematics classroom. In addition to our discussions on technology, the mathematics division has been examining both formative and summative assessment. We have talked about some tools for gauging the level of understanding on a day-by-day basis. Such techniques include the “quick write” or “one minute paper”, or the “clearest point/muddiest point concept”. We have held discussions on why these are beneficial to both the student and the instructor, and talked about how to use these techniques. Next we have discussed summative evaluation. We have had discussions on moving away from the traditional examination as the key element is assigning grades, and looking at portfolio assessment, especially in the courses for non-majors (such as Math for Liberal Arts.) As with the technology discussions, these workshops have been held “in-house” with faculty from the division facilitating the workshops. It has been especially rewarding to see the involvement and leadership taken by the newer faculty, who are more familiar and more comfortable in using these non-traditional methods.

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