Fall 2008—Volume 18, Issue 1

Connections

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Association of Mathematics Teacher Educators

http://www.amte.net

PRESIDENT'S COLUMN

Mathematics Teacher Education and Technology Education

Perspectives and Insights

Jennifer Bay-Williams, University of Louisville

Representing AMTE, I recently attended the tenth annual National Technology Leadership Summit (NTLS X). NTLS is an invited gathering of leaders from a range of organizations. Included in that group are various sister organizations, such as Association of Science Teacher Educators (ASTE), as well as numerous technology organizations. Those include: Association for Educational Communications and Technology (AECT), American Educational Research Association (AERA SIG-TACTL), International Society for Technology in Education (ISTE), and Society for Information Technology and Teacher Education (SITE).

As I listened to participants from a range of backgrounds and perspectives, I was taken by both the differences in the focus of some conversations, as well as the values and priorities that are shared with mathematics teacher educators. Central topics of conversation over the two-day meeting included gaming, students' use of technology in their out-of-school environments, and ways to create learning networks online, like social networks.

Informal and Formal Learning Environments

Perhaps the most clear distinction and an important take-away for me, was the attention to informal learning opportunities. Informal learning, including networking, gaming, and explorations, are enriching activities that are designed to be used for pursuing one's own interest (though they can find their way into formal classroom settings). A lot of the discussions included attention to how to make these opportunities more accessible to students. For example, there was an interesting project where students formed groups locally, but interfaced with students internationally as they designed projects. In mathematics teacher education, technology-related discussions tend to focus on helping teachers and administrators understand the value of using technology (including the still prevalent discussion that using calculators does not lead to a loss of skill development), learning about how calculators or software (e.g., Tinkerplots™) can enhance lessons, units, and the curriculum, how to address issues of equity in terms of access to technology, and more recently, what knowledge teachers need to effectively use technology. All of these issues target the school curriculum—the formal learning environment.

This is not to say that there isn't general recognition of the importance of informal learning opportunities, because there certainly is, but it is to say that discussions more often focus on the learning needs of students within the context of the school curriculum.

(cont'd on p. 10)

Thirteenth Annual AMTE Conference
Orlando, Florida
February 5 – 7, 2009

The Thirteenth Annual Conference of the Association of Mathematics Teacher Educators (AMTE) will be held in Orlando, Florida, from Thursday, February 5, through Saturday, February 7, 2009. **A full slate of conference sessions will begin on Thursday at 1:00 p.m.**

Hotel Information

The conference will be held at the Orlando Airport Marriott Hotel. We have a limited block of reduced-price rooms available at $159/night (single or double occupancy). We encourage you to reserve your room soon either online (find the link on the AMTE website) or by calling the toll-free number below. Be sure to mention the "AMTE Conference" when you call.

Make your reservation by **Friday, December 5, 2008** to get our special conference room rates. Filling the rooms at the conference hotel helps by reducing some of the conference expenses paid by AMTE, so help support AMTE by staying at the conference hotel. Please be aware that the conference block may be sold out by this date. It is best to reserve early. Once the room block is full, the hotel will accept reservations at the hotel's prevailing rate and only on a space-available basis.

Orlando Airport Marriott Hotel
7499 Augusta National Drive
Orlando, FL 32822 USA
Phone: 407-851-9000

New Doctoral Program at the University of Florida

The Department of Special Education and the School of Teaching and Learning at the University of Florida (UF) announce Project COMPUTE, a federal grant supporting the preparation of leadership personnel in special education. This project provides tuition remission, travel funds, and a generous stipend each year for four consecutive years to five, full-time doctoral students in Special Education who have interests in mathematics teacher education and research designed to improve the mathematics underachievement of students with disabilities. Project COMPUTE students will also be eligible to apply for fellowships and graduate assistantships within the College of Education. For further information, please contact Dr. Cynthia C. Griffin, Department of Special Education, ccgriffin@coe.ufl.edu (352.392.0701, Ext: 253).

Connections is published three times a year: fall, spring, and summer. The Editorial Board will consider a wide variety of types of submissions. Regular features include essays addressing each issue's Theory and Practice question, reviews of resources for mathematics teacher educators, and news articles related to mathematics teacher education. Each submission is reviewed by the Editorial Board for relevance to the AMTE membership and for quality of work. Please direct all comments, questions, or submissions to the editor at lknott@wsu.edu, or 509.335.4122.

Margaret (Maggie) Niess
Oregon State University

Advanced digital technologies have changed the nature of today's culture as well as how mathematicians think about and do mathematics. Has this change shifted how students today are learning mathematics? Are they using today's technologies in learning mathematical ideas? Unfortunately, too often the answer to both questions is "No!" Mathematics classrooms continue to lag behind even what students do with technology outside the classroom.

Yet, the challenge for integrating technology as a tool for learning mathematics has been made multiple times throughout the past decade. In 2000, the National Council of Teachers of Mathematics (NCTM) proposed a sound *Technology Principle*, indicating that "The existence, versatility, and power of technology make it possible and necessary to reexamine what mathematics students should learn as well as how they can best learn it" (NCTM, 2000, p. 25). The Association of Mathematics Teacher Educators (AMTE) Technology Position statement (2006) underscored the importance of the preparation of teachers for meeting the challenges presented by NCTM's *Technology Principle*, adding that "Mathematics teacher preparation programs must ensure that all mathematics teachers and teacher candidates have opportunities to acquire the knowledge and experiences needed to incorporate technology in the context of teaching and learning mathematics." How should teacher preparation programs be changed? Just what experiences will lead to the knowledge desired? These questions also need attention.

Numerous researchers have converged on a description of teachers' knowledge for teaching with newer technologies as the integration of technology, content, and pedagogy in much the same way that Shulman (1986) described pedagogical content knowledge (PCK) as the knowledge teachers need for teaching. Basically, they defined technological pedagogical content knowledge (TPCK) as that body of knowledge that teachers needed for teaching with and about technology in their assigned subject areas and grade levels. TPCK was described as the interconnection and intersection of content, pedagogy (teaching and student learning), and technology (Margerum-Leys & Marx, 2002; Mishra & Koehler, 2006; Niess, 2005; Pierson, 2001). The idea of TPCK continued to be discussed and agreed upon to the point that the American Association of Colleges of Teacher Education supported the collaboration of multiple TPCK authors in the development of *The Handbook of Technological Pedagogical Content Knowledge for Educators* (2008).

More recently, the conversations have led to repackaging the phrase of TPCK to **T**echnology, **P**edagogy, **A**nd **C**ontent **K**nowledge, or **TPACK**. The idea has been that TPACK more clearly exemplifies the complex, synergistic interplay among the three knowledge areas as the **total package** required for truly integrating technology, pedagogy, and content knowledge in the design of curriculum and instruction that prepares students for thinking and learning with digital technologies (Niess, 2008). For mathematics then the idea is that **TPACK** represents the knowledge and experiences teachers need for incorporating appropriate technologies within the context of teaching and learning mathematics.

The more recent challenge has now been that of clarifying the construct of TPACK into more specific guidelines. Just how is this knowledge described? Extending Grossman's (1989, 1990) four components of PCK, TPACK is revealed as the knowledge, skills and dispositions that teachers have for teaching with technology – or knowledge that includes:

- an overarching conception of what it means to teach the content with technology;

(cont'd on p. 4)

"TPACK is revealed as the knowledge, skills, and dispositions that teachers have for teaching with technology…"

- knowledge of instructional strategies and representation for teaching the content with technology;
- knowledge of students' understanding, thinking, and learning the content with technology;
- knowledge of curriculum and curriculum materials that integrate technology in their subject. (Niess, 2005)

Adding the content of mathematics to this description is easy. But the question of what those four components mean is much more challenging as mathematics teacher educators attempt to determine the type of preparation needed for preparing mathematics teachers for teaching with appropriate technologies.

I. Designing and developing digital-age learning environments and experiences Teachers design and develop authentic learning environments and experiences incorporating appropriate digital-age tools and resources to maximize mathematical learning in context. Teachers…	
1.	identify, locate and evaluate • mathematical environments, tasks, and experiences in the curriculum to integrate digital technology tools for supporting students' mathematical learning and creativity; • appropriate technological resources and tools for these mathematical environments, tasks, and experiences.
2.	design appropriate mathematical learning opportunities that incorporate worthwhile mathematical tasks, based on current research and that apply appropriate technologies to support the diverse needs of all students in learning mathematics (considering diverse learning styles, working strategies, and abilities using digital tools and resources).
3.	plan strategies to facilitate equitable access to technology resources for all students in learning mathematics.
II. Teaching, learning and the mathematics curriculum Teachers implement curriculum plans that include methods and strategies for applying appropriate technologies to maximize student learning and creativity in mathematics. Teachers :	
1.	incorporate knowledge of all students' understandings, thinking, and learning of mathematics with technology.
2.	facilitate technology-enhanced mathematical experiences that foster creativity and encourage all students to develop higher order thinking skills while promoting discourse among students as well as among teacher and students.
3.	use technology to support learner-centered strategies that address the diverse needs of all students in learning mathematics.
4.	advocate, model and teach safe, legal, and ethical use of digital information and technology use by all students in learning mathematics.

Table 1 (above and cont'd on p. 5)

III. Assessment and evaluation Teachers apply technology to facilitate a variety of effective assessment and evaluation strategies. Teachers …	
1.	apply appropriate technologies to assess all students' learning of mathematics, reflect upon the assessment results, and communicate those results using a variety of tools and techniques.
2.	assess students' appropriate use of technology resources in learning and communicating mathematics.
3.	use formative assessment of technology-enhanced student learning to evaluate students' mathematics learning and to adjust instructional strategies.
4.	align the technology expectations for assessment tasks and practices with that of mathematics classroom activities and expectations.
IV. Productivity and professional practice Teachers use technology to enhance their productivity and professional practice. Teachers …	
1.	evaluate and reflect on the effective use of existing and emerging technologies to enhance all students' mathematical learning.
2.	exhibit leadership by demonstrating a research-based vision of integrating technology in teaching mathematics.
3.	demonstrate and promote safe, legal and ethical use of technology for learning and exploring mathematics with students, parents, and colleagues.
4.	use technology to communicate and collaborate with parents, colleagues, and the larger community in order to nurture student mathematical learning.
5.	regularly engage in and share with other teachers ongoing professional activities that take advantage of digital age communication resources, as well as face-to-face gatherings, to improve technological, pedagogical, and content knowledge that promotes student creativity and learning in mathematics.

During AMTE's 2008 annual conference, the Technology Committee held a workshop focused on what it might mean to build mathematics teachers' TPACK. This workshop launched the development of mathematics teacher standards with the goal of providing more specific guidelines for teacher preparation programs. The ideas from the workshop were refined throughout this past year through multiple conference presentations and discussions. The International Society for Information Technology in Education (ISTE) helped in the discussions through its revisions of the original National Educational Technology Standards (NETS) for Teachers (2002). The second edition (2008) of this set of standards provided language for the draft of the TPACK standards.

The table above and on the previous page provides the current draft of the standards explicating what mathematics teachers need to be able to do.

Do these statements adequately capture the essence of teaching mathematics with appropriate technologies? Do they provide direction for making revisions in mathematics teacher preparation programs? What is missing and needs to be added? Do some statements need rephrasing?

Ultimately, the Technology Committee plans to finalize the draft of these standards with the intent of proposing them to the AMTE Board for endorsement. We need your input on these questions about the draft standards. Please send your ideas via an email to the chair of the Technology Committee, Maggie Niess, niessm@onid.orst.edu.

We hope to have your input before we put these standards to a test in redesigning mathematics methods courses. That activity will happen in a preconference Technology Committee workshop at the AMTE's February 2009 annual conference: Using Technology Standards for Mathematics Teachers to Design Learning Environments and Experiences for Methods Courses.

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Florida Association of Mathematics Teacher Educators (FAMTE) News

The Florida Association of Mathematics Teacher Educators (FAMTE) held its annual mini-conference on the University of Central Florida Campus in June. The conference focus was the newly adopted Sunshine State Standards for Mathematics. Conference topics addressed how Florida's educators are responding to the new standards in terms of content, methods, professional development and mathematics teacher education.

FAMTE president-elect, Paige Allison, attended the Florida Council of Teachers of Mathematics Board Meeting and Leadership Conference in September. Updates on state assessment issues and the new Florida Sunshine State Standards were addressed as well as grants and awards. FCTM and FAMTE members will be working in regional groups to expand the remarks and examples for the Algebra body of knowledge for the state. The topic for Florida Math Day 2009 is Multicultural Mathematics.

DON'T FORGET — AMTE ELECTION!!!

The AMTE election will be held between November 1 and December 1, 2008.

Instructions will be posted on the AMTE website and were recently sent to members in an email.

Show us how you did that problem!

Dennis St. John
Central Michigan University

As educators, we know that we have learned more about the mathematics we teach through teaching others. We also know that when our pre-service teachers begin teaching others they often lack the insights necessary for teaching mathematical concepts, skills and procedures. When they teach, we also have the opportunity to observe them. Through this we learn how they will approach a problem, develop a concept or skill. At Central Michigan University we are teaching four new courses as part of a new model for secondary mathematics teacher preparation. In the past we left peer teaching for the methods course instructor but this is no longer the case. In these new classes students are responsible for teaching others in a variety of ways. Providing frequent opportunities for teaching and observation are an important facet of our program.

Video Screen Capture, Mathematics Software and a Problem

The first course in our new program is designed to help students make the connections among middle and high school mathematics, and among ideas from Calculus and Abstract Algebra (Lapp, 2008). The second course is focused on Geometry where students are immersed in a guided discovery method of teaching by modeling and building their own discovery lessons (Vonder Embse, 2008). The third course focuses on probability and statistics, and like the first two, is also inquiry-based and technology-enhanced. The fourth course is a capstone course with a school-based observation/teaching component. Student teaching typically follows the semester after the final course.

Students in these courses provide instruction to each other, both in and out of class. All students in the first three courses serve at least twenty hours per semester in the Mathematics Assistance Center tutoring students in material from developmental mathematics through calculus. They also provide peer instruction with presentations and design of themed bulletin boards. Their instructional opportunities are not limited to "in class" demonstrations due to new affordable technologies used simultaneously. In the third course, our students use screen-capture software to narrate solutions and approaches to a variety of mathematics problems. These low cost software options allow our students the opportunity to practice delivering presentations, review and revise and then share with each other. The software used to capture computer screens includes: Jing, IShowU, Camstudio and Captivate. Jing and Camstudio are now free; IShowU is low cost while Captivate is a software title used by professionals to create high quality podcasts. These screen/voice capture software titles are used with spreadsheets, dynamic geometry and statistics software. They are also used with other mathematics software like graphing calculator emulators. After students produce a short narrated video clip they either post them online or send them for viewing to others.

Since I teach the third course in the sequence my students are already comfortable and skilled in using geometry software and CAS technology for problem solving. I have the luxury of teaching students who have had a number of written assignments using the TI-Nspire™ CAS learning handheld in algebra and geometry.

These assignments focus students' attention on problem solving, multiple representations and communication of their understanding in a rich mathematical setting. In the third course we extend their communication of mathematical ideas to include the presentations made with screen and voice capture and math software for probability and statistics. In the next few paragraphs I outline how I introduce software in a problem-solving setting.

I begin by introducing a problem and solicit initial ideas for how to approach the problem. The problem below was chosen because of the many ways the Monte-Carlo procedure can be applied and because this problem has multiple solutions tied to the randomization procedure for producing these random chords.

Given a circle, find the probability that a chord chosen at random is longer than the radius of that circle. Use a Monte-Carlo approach to simulate your choice of random chords. Explain your approach.

Students are encouraged to think-pair-share their initial thoughts about how to attack this problem. Their ideas are then shared with the whole class and typically involve two main approaches for creation of randomly generated chords:

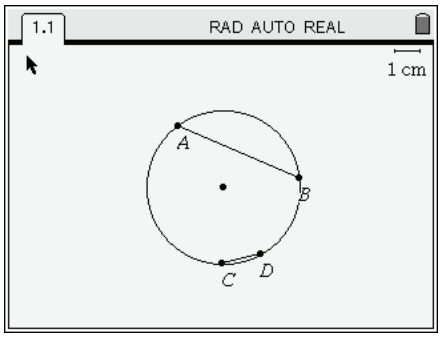

Figure 1

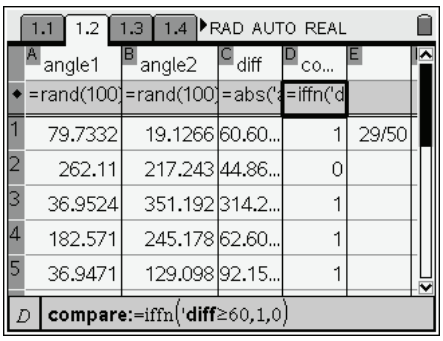

Figure 2

The most common method involves choosing two points on the circle and measuring the chord. A number of chords are generated and then the ratio of chords longer than the radius to the total number of chords generated is computed. The location of points can be generated by randomly selected angles stored in a spreadsheet. The lengths of these chords can be computed as well as the ratio to estimate this probability as shown in Figures 1 and 2.

A second approach -- adopted by fewer students -- involves the random selection of a point inside the circle. Selecting an angle for the ray and a distance from the center chooses this random point. Drawing a ray from the center through this randomly chosen point can be used to generate a chord, by drawing a line perpendicular to the ray through the point. This perpendicular contains the chord, and the randomly chosen point is the midpoint of this chord. Points can be chosen and chord lengths computed in the spreadsheet as seen in Figures 3 and 4 below.

After they discuss their initial approaches, the students use the TI-Nspire™ learning handheld to implement their solution. During this time, I provide individualized or small group instruction, answer questions and listen to their discussions. Before the next class, they submit their solution strategy document that includes notes describing their approach and findings, spreadsheets with data from their simulation, as well as geometric constructions and computations done with the handheld.

When they return I have them reconstruct their document on the computer using TI-Nspire™ CAS software or the emulator in the TI-Nspire™ CAS Teacher Edition with the screen capture program active. The software captures motion images of their constructions and shows their use of the various applications (Notes, Calculator, Spreadsheets & Lists, and Data & Statistics). Their first use of the screen capture software is often discarded as they review their work. We typically pause after about ten minutes to discuss what they need to do to improve their presentations. Most agree that the construction of the document is the easiest to do while the narration is the most challenging.

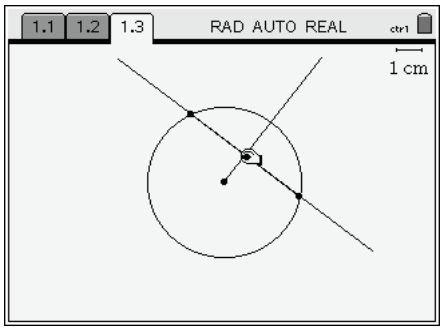

Figure 3

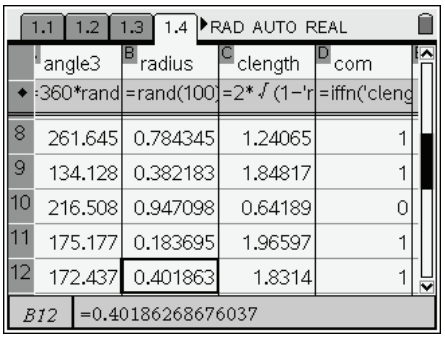

Figure 4

Knowing how to do something and completing the task seem easy but sharing the reasons for your steps, providing an overview of an approach or method, and knowing how much to tell are difficult decisions to make on the fly. Most of the students agree that the narration must be decided before the next attempt is made to capture images and narration. Note that the narration can be added later with some video screen capture titles.

Finally, students are given the task of observing five or six of the other students' narrated solution videos. They are asked to focus on the difference in approaches, to see if there are different solutions and to pose questions for each video creator. When the class begins after their observations, the discussions have several common threads including: praise for each other's work, suggestions for improvement, and the generation of additional or hybrid solution strategies. This problem also provokes the comment: "I have never seen a problem with more than one answer." This problem was chosen because there are multiple solutions; the problem simply is not well defined. My students are always surprised that their answers may be different from some of their peers yet a variety of answers are "right". The phrase "chosen at random" has several interpretations that impact the outcome. There are several methods that can give different answers because the underlying distribution of chord lengths depends on the randomization procedure (Bogomolny, 1996).

Benefits

How do we profit from using a combination of technologies? Students get to explain their methods, sharing them both in and out of class. We can extend the class time for presentation, observation and interaction. Asking students to review a portion of solutions in video format is more likely to be accomplished than asking them to review solutions in written format. Our students get to listen to each other. They also benefit from additional teaching opportunities and see how others accomplish the same task. Finally, all of us get additional observation opportunities.

When my students are asked about the benefits of pairing these technologies, they see that they will have more options when they teach. They can capture presentations made in class for students who are absent. They can create presentations that are ready to be played if they have a substitute teacher. One student even suggested that students could observe these videos outside of class in order to revisit a problem or see how the technology was used. Another student thought this might be a way to show parents and administrators how technology can be used to enhance problem solving. Some aspiring teachers imagined that someday their future students might download math podcasts to study. A few even dreamed that their future students might produce presentation videos.

Summary

Our aspiring secondary math teachers must learn to listen to their students in order to become better teachers. We all learn from our preparation, our discourse with students and feedback from written assignments and assessments. We can also learn from each other by learning to listen. The pairing of video/voice capture with mathematics software allows us to dramatically extend those opportunities for our aspiring secondary math teachers by providing multiple approaches to problems in and out of class. Our students enjoy watching videos, why not take advantage of their preferred media?

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President's Column (cont'd from p. 1)

We have all heard the phrase, "when you need help with technology, find the youngest person on the staff to help you." In teacher education technology classes, we find that the technology tools identified as important for teachers to know are often tools that teacher candidates already know how to use. This might lead some of us to draw the conclusion that new teachers may be more effective at using technology in their teaching. Yet, in the anecdotal reports of the NTLS Mathematics and Science Breakout Group, this theory was challenged. The newer teachers, while possibly more fluent with technology, have not yet mastered the pedagogical skills that result in critical thinking and focusing on important mathematics, and therefore use technology to model or to provide additional skill practice. It is the more experienced teacher, who has the vision and skills of what counts as important mathematics, who is better able to use technology to promote problem solving, critical thinking, and learning. While only a theory backed by anecdotal stories from various participants, it is a theory that leads me to ask the following:

In what ways do teachers with varying levels of teaching experience and technology backgrounds use technology?

What would be the implications for the preparation and ongoing professional learning opportunities of teachers?

What experiences or cases might we design that would help teachers make informed choices about the use of technology?

The **AMTE Technology Committee** has been developing standards that propose the knowledge that teachers need to be effective users of technology (see article by **Maggie Niess** in this issue). These promise to provide a framework for learning more about what it is that teachers need to know to be effective in using technology to enhance student learning.

Technology as More than Knowledge and Skills

Perhaps it was sitting in the building that houses AACTE (or because my university just had our NCATE visit) that I realized that the conversations were not as much focused on technology-related knowledge and skills for students or their teachers, but on technology-related *dispositions*. There was an interesting conversation about how some teachers are willing to try to figure out how to do something with a new technology application or to introduce students to a new technology, even when they are not completely comfortable with it themselves, but other teachers are not. Put differently, some teachers have a disposition toward exploring technology and tinkering to find ways to use it for teaching mathematics. *Adding It Up* (NRC, 2001) includes in its five proficiencies of knowing mathematics a "productive disposition." To promote a productive disposition in mathematics, many of us try to organize our courses and professional development so that teachers are able to develop a productive disposition to do mathematics (and to teach mathematics). For me, at least, the same is not true for how I have approached technology use. I tend to showcase quality tools and how they are used to teach various mathematics concepts. It occurred to me that in the same way that a productive disposition in mathematics must be developed through experiences, a productive disposition in technology could better be fostered through a different approach than what I have been doing. To foster a productive disposition in using technology, a better approach might be to provide opportunities to explore technologies, asking my teacher candidates to *figure out* how it can be used to enhance learning of important mathematics ideas. This notion of tinkering with technology and developing in teachers a disposition to explore and figure out how to use technology is certainly worthy of attention and was a major topic of conversation at NTLS X.

In Conclusion

I have had the good fortune to live in several countries – in each case, I learn so much about their cultures, but also learn much about my own culture and myself. Going to NTLS X had a similar impact – hearing voices from outside of mathematics education helped me to understand their perspectives better and to reflect on my own world of mathematics education. AMTE is fortunate to have collaborations across disciplines and to be engaged in activities with numerous organizations - it is through our engagement with the broader education community that we can be more informed, more influential, and better at preparing and supporting mathematics teachers.

There will be several Preconference Events held on Thursday morning, February 5, 2009, at the 2009 AMTE Annual Conference at the Orlando Airport Marriott Hotel. Each session requires pre-registration; information is below. No onsite registration will be available. Please contact each event's organizer for more information. **The regular conference sessions will begin at 1:00 PM on Thursday, February 5.**

NCTM's NCATE Program Reviewer Training Workshop
Sponsored by the National Council of Teachers of Mathematics

Organizer/Presenter: Monique Lynch (mlynch@nctm.org).
Time: 8:00 a.m. – 12:00 p.m. Session limit: 30 participants
Description: The mathematics program review process for NCATE has undergone a complete change since the completion of spring 2004 reviews. This session is designed to prepare potential program report reviewers for the NCATE system.
To Register: E-mail nctmncate@nctm.org and indicate that you are interested in attending reviewer training on February 5. There is no charge to attend, but the completion of an application and pre-registration for the workshop are required. For more information, see http://www.nctm.org/ncate.aspx.

TECHNOLOGY WORKSHOP
Using Technology Standards for Mathematics Teachers
to Design Learning Environments and Experiences for Methods Courses

Organizers/Presenters: AMTE Technology Committee: Maggie Niess, Chair(niessm@onid.oregonstate.edu), Shannon Driskell (Shannon.Driskell@notes.udayton.edu), David K. Pugalee, Bob Ronau, Suzanne Harper, Kathy Shafer, Chris Johnston and Marcia Weller Weinhold
Time: 9:00 – noon. Session limit: 40 participants.
Description: Engage in the development of effective instructional strategies directed toward the development of preservice mathematics students' TPACK (Technology, Pedagogy, and Content Knowledge). Instructional strategies reflect the TPACK standards completed through the Technology Committee's efforts during 2008.
To Register: Indicate your interest on the AMTE Conference Registration Form.

To CAS or not to CAS…
Sponsored by Texas Instruments

Presenter: Steve West, Faculty Director of GREAT Day and Distinguished Teaching Professor Emeritus, SUNY at Geneseo, NY
Time: 9:00 a.m. to 12:00 p.m. Session limit: 25 participants.
Description: With the introduction of capable and inexpensive handheld computer algebra systems (CAS), the teaching of mathematics has entered a new and exciting yet critical stage. Every CAS system has the capability of duplicating virtually all of the symbolic manipulation found in most high school and college algebra, pre-calculus, and calculus courses. The question becomes: What role does CAS play, if any, in the teaching of these courses and in the preparation of pre-service mathematics teachers? The major focus of this session will be on the pedagogical implications of using a CAS system to enhance the teaching and learning of algebra, pre-calculus and calculus. In addition, the role of CAS in assessment will also be discussed. Attendees will have the opportunity to get hands-on with the TI-Nspire CAS handheld.

To register: There is no registration fee but you must register by sending an email to Paula Watson at pwatson@ti.com. Please include the phrase "AMTE TI Workshop" in the subject line of your email.

See page 13 for another special opportunity.

TE-MAT: Your Online Guide to Mathematics Professional Development Materials

David K. Pugalee, University of North Carolina Charlotte

We live in the information age. There is a large number of materials available to help professionals design, implement, and assess professional development in mathematics. It is easy to spend hours searching for that resource that will provide a powerful experience for professional development participants. AMTE is pleased to provide an ongoing resource to help you with this task. AMTE is working to continue to the TE-MAT (Teacher Education Materials) database of professional development materials that was begun by Horizon Research as part of a NSF-funded initiative. The National Science Teachers Association is continuing the review of science professional development materials and manages the database. The goal of the project is to develop an online resource to support professional development providers as they work to enhance the capacity of pre-service and in-service teachers to provide high-quality K-12 mathematics education. The database includes hundreds of reviews of resources for the professional development provider. Users may search the database by keyword, descriptor, or browse an alphabetic index of materials. The descriptor search allows one to easily target specific resources by selecting a category for professional development, classroom, topic area, or trade book. Professional development categories include deepening teacher content knowledge, designing/implementing professional development, developing/implementing student assessments, evaluating professional development, improving classroom practice, selecting instructional material, teacher work, understanding how students learn, understanding issues of school change/ systemic reform, understanding national standards, and understanding/using research.

Classroom descriptors include administration, assessment, critical thinking, curriculum development, facilities, informal science (museums, zoos, etc.), investigations/activities, multiculturalism, special education, teaching strategies, technology instructional tools, and technology skills. Topic area descriptors for mathematics include calculus; data analysis, statistics, and probability; discrete math, functions, geometry and spatial sense, mathematical structures, measurement, and number and operations.

The following excerpts from the review (completed by Trina Wilkerson) of *The Math We Need to Know and Do in Grades 6-9: Concepts, Skills, Standards, and Assessments: Concepts, Skills, Standards, and Assessments* by Pearl Gold Solomon (2007) demonstrates the informative level of the reviews.

"While standards and textbooks provide some detail for how and what to teach, they lack the depth, specificity, and clarity of detail (such as "clarifying underlying or embedded mathematical concepts") that may be useful to classroom teachers to address student needs in mathematics. This second edition builds on the first by providing that concrete information, expanding to include implications of the *No Child Left Behind Act* (NCLB), further research on the teaching and learning of mathematics, and the recent focus on curriculum alignment in state curriculum guides, as well as National Council of Teachers Mathematics curriculum documents such as *Curriculum Focal Points for Kindergarten Through Grade 8 Mathematics* (2006). While this book includes model activities, it is not intended to be a mathematics textbook; nor is it a complete guide to all the pedagogical knowledge needed for teaching mathematics. Rather, it is a resource to "compensate for the missing components of recent texts and curriculum guides."

The author further explains that while the intent is to fill curricula gaps it probably does not fill all, so that as teachers use this document with its approach they may identify other constructs that focus on mathematical knowledge.

This book is designed for use by classroom teachers, teacher trainers, math coaches, professional development leaders, and curriculum writers/facilitators as a resource along with other materials. While it focuses on grades 6-9, it can also be useful for earlier and later grades as a reference particularly for prior knowledge, curriculum alignment, and meeting individual student differences across grade levels. The major purpose seems to be for the "identification of the specific, embedded concepts of mathematics (*what we need to know)* and the matching skill expectations (*what we need to be able to do)* to apply and demonstrate what we know." It can be used for planning, assessing, and addressing individual needs related to conceptual and procedural understanding, and as a tool for reviewing mathematical concepts." **(cont'd on p.13)**

(**cont'd from p.12)**

New reviews of materials are being posted all the time. Marshall Lassak's review of Diane Ronis' *Problem-Based Learning for Math & Science: Integrating Inquiry and the Internet,* 2nd Edition (2007), will be posted soon. Marshall had this to say about the book: "This work is a 156 page book focusing on the theory and practice of problem-based learning and teaching in the middle level and secondary mathematics and science classroom. A research-based argument for problem-based learning and an explanation of how to implement it follows.

The author provides research and projects to help current and future teachers succeed with using problem-based learning. The book has six chapters and eight problem-based learning contexts for use in the classroom. The first two chapters define many terms and give background for those terms and ideas. Chapters 3 and 4 deal with implementation and different types of problem-based learning. Chapter 5 deals with assessment and Chapter 6 deals with partnerships as a way of gaining outside of school support for problem-based learning.

Visit TE-MAT at http://www.te-mat.org/ or follow the link from AMTE's welcome page (www.AMTE.net) to access the full reviews and to keep up with the latest additions to the database. Feel free to alert us about mathematics professional development material that you use or are aware of that might not be in the database. Email David Pugalee at David.Pugalee@uncc.edu. We welcome your feedback and assistance.

A SPECIAL OPPORTUNITY in ORLANDO
TeachME Mathematics: Teacher Training in Multiple Environments

Organizer/Presenter: University of Central Florida Academy for Teaching, Learning, and Leadership
Time: 9:00 a.m. – noon, Thursday, February 5, 2009
Description: The TeachME (Teaching in Mixed-reality Environments) experience is a mixed-reality virtual environment in which the students are virtual and the teaching is real. TeachME is housed at the University of Central Florida (UCF) and provides a unique method of teacher training in an environment which does not put actual children at risk while allowing teachers to hone their skills. Come experience this environment for yourself and participate in break out sessions examining learning environments for fostering mathematical knowledge for teaching at either the elementary or secondary levels. Note: participants must provide their own transportation from the hotel to the UCF campus.
To register: Go to: http://education.ucf.edu/mathed/AMTE2009PreConference. The registration deadline is January 26, 2009.
PLEASE NOTE: This opportunity is not part of the Annual Conference and will be held on the UCF campus. Complete details are available on the AMTE website.

AFFILIATE NEWS

The New Jersey Association of Mathematics Teacher Educators (**NJAMTE**) co-sponsored a conference in February on articulation between two-year and four-year colleges, in collaboration with the NJ MAA Section and the NJ AMATYC affiliate.

NJ AMTE also held its Second Annual Conference on May 13th at The College of New Jersey. The program included a presentation by Bob Riehs of the New Jersey Department of Education on state initiatives, including high school reform, standards revision, and changes in assessment. It also included a presentation by Sharon Sherman on survey results concerning mathematics and mathematics education course requirements for preservice undergraduates across the state, with a discussion led by Cathy Liebars of mathematics content requirements to propose to the state for preservice K-5 teachers. The conference concluded with a business meeting chaired by Janet Caldwell, President. **The Third Annual Conference will be held on May 14, 2009**.

NEW AFFILIATE ESTABLISHED IN TEXAS

In July 2008, a group of mathematics teacher educators met to establish a new AMTE affiliate in the state of Texas. AMTE-Tx will receive official recognition of affiliate status during the business meeting of the annual conference of AMTE in Orlando, Florida. The newly elected officers are Sandi Cooper, President; Colleen Eddy, President-Elect; Sylvia Taube, Secretary; Trena Wilkerson, Treasurer; and Suzanne Nesmith, Barba Patton, and Connie Yarema, Board Members. The goal of this new affiliate is to better organize mathematics teacher educators in the state of Texas to discuss and address issues related to preparing effective mathematics teachers. During this next year, AMTE-Tx will host a special strand of sessions for mathematics teacher educators during the Conference for the Advancement of Mathematics Teachers (CAMT) in Houston, Texas. For more information, contact Dr. Sandi Cooper at 254.710.3246.

PENNSYLVANIA ASSOCIATION OF MATHEMATICS TEACHER EDUCATORS

Membership efforts were underway this summer headed by Lynn Breyfogle in an attempt to recruit new members. This campaign was successful and resulted in total current membership at 68. Also many thanks to Jim Preston, our webmaster, for the redesign of the organization's website this summer (it can be viewed at www.pamte.org). Also, finishing touches are being put on our fall newsletter by our editor, Mary Lou Metz. Many thanks to Mary Lou and those PAMTE members who contributed articles to the newsletter. And Jason Silverman has set up an electronic discussion board at Googlegroups in order to further engage our members in discussion on the research brief provided in the newsletter.

The next PAMTE event will be held in conjunction with the PCTM Annual Meeting in the Pocono Mountains, Split Rock Resort to be held November 5-7, 2008. In the late afternoon of November 5, there will a PAMTE program free to PAMTE members which will include an informal reception sponsored by Texas Instruments, followed by a choice of three roundtable discussion sessions: Restructuring of programs for the new PDE certification guidelines in elementary/middle level teacher education; Including special needs and ELL requirements in secondary level math education programs; and Preparation/professional development efforts of in-service math teachers. A PAMTE strand of sessions will be offered during the remainder of the conference November 6-7 open to all math educators registered for the PCTM conference. One session in particular on November 7 is a panel addressing Best Practices in Mentoring Student Teachers. A panel of university supervisors (Nina Girard, University of Pittsburgh at Johnstown; Tom Evitts, Shippensburg University; and Jim Preston, Slippery Rock University) and their cooperating teachers will discuss successful strategies that can be utilized with student teachers, as well as how to best deal with challenging student teachers. Time for discussion and sharing will provided so that experienced and new cooperating teachers can exchange ideas and engage in conversation. In addition, PAMTE is helping to sponsor a pre-service teacher day as part of the conference on November 6. The planned activities will attempt to engage pre-service teachers as much as possible in the learn/reflect process. The overall goal is to expose them to the importance of professional organizations and attending conferences for continued professional development, as well as make them feel welcomed as beginning professionals. If you are interested in registering your pre-service teachers for this event, please contact Dr. Mike Long at malong@ship.edu.

We continue to be energized with the growth and activities of the affiliate, and we welcome any questions or suggestions. Feel free to contact President Nina Girard at nina@pitt.edu.

Thanks to Texas Instruments for supporting this issue of AMTE *CONNECTIONS*

AMTE Affiliate Connections Committee News

There will be tables set aside during breakfast at the 2009 AMTE Conference in Orlando for Affiliates to meet! Bring a sign to advertise your Affiliate and invite new members to join your table for breakfast. Also bring membership forms!

Let anyone on the Affiliate Connections Committee know if there will not be a contingent from your organization at convention – and we can stand in for you!

Jane Ries Cushman, jcushman@math.buffalostate.edu

Dr. Nadine Bezuk Continues her Service to AMTE

The AMTE Board of Directors is pleased to announce that Dr. Nadine Bezuk has agreed to continue her service to the Association by serving another term as AMTE Executive Director.

Dr. Bezuk is a founding member of AMTE and has served in many leadership roles, including as Executive Director since 2001. During her tenure she has witnessed rapid growth in membership, services, and national visibility of the Association. Past presidents and members of the Board of Directors of AMTE are unanimous in their praise for her efforts and leadership. Jenny Bay-Williams, who served as AMTE secretary from 2001-2005 and as president-elect/ president from 2006-2008 shared, "Among Nadine's many strengths are her uncanny ability to remember what the organization has decided and to pull related documentation within minutes of the issue arising, her gift for knowing when particular tasks need to be done and kindly and persistently making sure they happen, and finally, her innovative and forward thinking ideas that benefit AMTE." Dr. Bezuk works tirelessly and often behind the scenes to ensure that the organization serves its members and contributes to national conversations regarding the improvement of mathematics teacher education.

AMTE to Benefit from New Dues Process at NCTM

Beginning June 1, 2008, the Affiliate Rebate Program was revised to centralize the collection of NCTM dues payments and redirect the efforts of NCTM Affiliates towards promotion of the program, rather than administrative and financial management. NCTM now encourages Affiliates to promote the availability of the online application and renewal form for NCTM membership and to discontinue the collection of NCTM dues payments.

How It Works:

- Any individual who joins or renews membership online will be given the option to select an Affiliate to receive the rebate.
- Only one Affiliate may be selected on the form for the rebate. The list shows only those Affiliates in the individual's state, as well as multi-state and at-large Affiliates.
- Affiliates will not be required to verify an individual's membership status in the Affiliate for this program. Rebates will be provided to Affiliates from any individual who selects them on the online application or renewal.
- Rebate amounts: $3 for renewing full and e-members; $5 for new full and e-members.
- Existing business rules will apply to lapsed members who return to NCTM. Currently, an individual is considered new after one year of non-membership in NCTM.
- Multi-year rebates will be provided on multi-year memberships (i.e., a three-year membership renewal will result in a $9 Affiliate rebate).
- No rebates will be provided for Emeritus, Student, Institutional, or K-8 school memberships.

Rebates will be submitted to Affiliates on a quarterly basis. NCTM will discontinue rebates for any dues collected directly by NCTM Affiliates.

Information on how this works is available at http://www.nctm.org/uploadedFiles/About_NCTM/Affiliates/Resource_Center/benefits/ReadytoPrintRebateAd.pdf

Online at
http://www.amte.net

Membership/ Renewal Forms

Position Papers

Position Listings

Resources

Forum for Members

Conference Information

Other Opportunities

Upcoming Conferences

2008

November 6—7	NCTM Regional	Reno, NV
November 13—15	SSMA	Raleigh, NC
2009		
January 5—8	AMS-MAA Joint Mtg	Washington, DC
April 13—17	AERA	San Diego, CA
April 22—25	NCTM Annual	Washington, DC
July 19—24	PME 33	Thessaloniki, Greece
August 6—8	Mathfest	Portland, OR
September 23—26	PME-NA	Atlanta, GA

Reminder: The date on the label indicates the month that your membership is due to expire.

Libby Knott, AMTE *Connections* Editor
Department of Mathematics
Washington State University
PO Box 643113
Pullman, WA 99164-3113

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