

CTE Today

A Newsletter for Teachers at USMA

Center for Teaching Excellence

November 2007

"If I had six hours to chop down a tree, I'd spend the first hour sharpening the ax."

-- Abraham Lincoln

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Preparing Content Effectively, by Dr. Mark D. Evans, CTE Director

There are times when all teachers need to prepare material for presentation to students. The question arises as to how well one should prepare — and can one prepare too much or too little? The answer is Yes... and No.

Classical Greek orators prepared so thoroughly that their performances were flawless yet appeared spontaneous. Joseph Lowman (2000—see p4 of this newsletter) suggests that teachers could take a page from that book. Preparation is essential, yet it is also essential that cadets feel that the class is spontaneously unfolding and that they are “part of the performance”, if you will — not mere observers of the show.

“The actual delivery should have a sense of immediacy, as if the speaker were having for the first time many of the thoughts he or she is sharing with the students.” (Lowman, 2000). Teaching should involve a dialog *with* the students, not *at* the students.

Consider the classroom time that you have with cadets as your most precious commodity. Give great thought to how you will best use that time interacting with them. Consider the lesson and where it fits into the course. Will your 55 minutes together be best spent ...

..describing the intricacies of new content?
..problem solving in groups, individually, as a class?
..taking boards?
..having a group discussion?
..taking a quiz or a WPR or other assessment?
..showing and describing interest material?
..writing or building something?
..with a teacher or cadet led Q&A session?

“[Classroom presentations] should have a sense of immediacy, as if the speaker were having for the first time many of the thoughts he or she is sharing with the students.”

The list goes on and on — the point is that every minute of every lesson is yours to plan and execute.

The better prepared a teacher is, the more spontaneous the class will appear. Think about it. You don't want your class to appear overly rehearsed and

stifling — so to overcome one should prepare more? Sure. Picture Teacher A walking in with notes in hand, not well

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rehearsed. Which way will the lesson go — exactly as laid out in the notes. Now picture Teacher B, so well prepared that, while he prepared notes, he does not carry them in, or does not refer to them. This teacher has prepared so well so as to allow the class go in the direction the cadets take it, yet he is vigilant to keep them focused on the topic material.

Heed Lincoln's advice; spend time “sharpening your ax” and it will serve you better.



Upcoming Conferences

2007 Annual Conference of the Middle States Commission on Higher Education, In Plain Sight: Making the Higher Education Story Clear, December 8 – 11, Philadelphia, PA, <http://www.msche.org>

94th Annual Meeting of the Association of American Colleges and Universities, Intentional Learning, Unscripted Challenges: Knowledge and Imagination for an Interdependent World, January 23 – 26, 2008, Washington DC, www.aacu.org

7th Annual Conference on The First-Year Experience, February 15-19, 2008, San Francisco, California, <http://www.sc.edu/fye/>

Annual Conference for the Society for Research on Educational Effectiveness, March 2 – March 4, 2008, Crystal City, VA, <http://www.educationaleffectiveness.org/conferences/2008/>

2008 American Education Research Association Annual Meeting, March 24 - March 28, 2008, New York, NY, <http://www.aera.net/>

5th annual Teaching Professor Conference, May 16 – 18, 2008, Kissimmee, FL, <http://www.teachingprofessor.com/conference/index.html>

2008 Textbook and Academic Authors Association Conference, June 20-21, 2008, Las Vegas, NV, <http://www.taaonline.net/TAAConference/index.html>

20th Annual World Conference on Educational, Multimedia, Hypermedia, & Telecommunications, June 30 – July 4, 2008, Vienna, Austria, <http://www.aace.org/conf/edmedia>

The Science of Education: Sorting Fact from Fiction in Cognitive Neuroscience and its Implications for Teaching, *By Dr. Kimberlee Bonura, CTE*

A recent trend in education is the focus on what advocates call Brain Based Education. Pop psychology texts (for instance, Eric Jensen's *Teaching with the Brain in Mind*) provide guidelines for improving the classroom experience, but renowned scholars suggest that educators approach with caution. "Although there is a growing body of peer-reviewed literature ... that provides clear and accurate summaries of progress in the cognitive neurosciences of learning, there are at the same time questionable media reports and numerous other claims about 'brain-based learning' that ... often oversimplify, misrepresent, and allow for 'neuromyths' to flourish" (Ansari & Coch, 2006, p. 147).

Leading scholars in the field, such as the Harvard faculty who founded the International Mind, Brain and Educational Society (IMBES), use the term Mind, Brain, and Education (MBE). They affirm that neuroscience research **does** have implications for educational practice, **but**, according to Elsbeth Stern, professor of cognitive and edu-

research with functional Magnetic Resonance Imaging (fMRI) indicates that there are at least two neural systems involved in processing mathematical information (Dehaene, 1999). Future research may therefore impact how math teachers approach different learning situations. Other fMRI findings demonstrate that the emo-



tional context of a situation impacts which aspect of memory is activated in learning (Erk, 2003) and that the brain region emphasized in language learning is impacted by the nature of the language – with transparent writing systems (i.e., systems where the written language closely reflects the spoken language, such as Italian), non-transparent writing systems (such as English), and character-based writing systems (such as Chinese) leading to activity in different areas of the brain (Goswami, 2006). MBE research may even allow education to expand to individuals currently underserved by the educational system – in one study with a brain-machine interface, a patient with Amyotrophic Lateral Sclerosis (ALS, commonly known as Lou Gehrig's disease) was able to answer questions by producing different brain images for "yes" and "no" – allowing the individual to communicate for the first time in two and a half years!

Current Application – The Take-away for Your Classroom

More isn't always better. The brain can reorganize itself for learning through our lifetimes, and we learn through interaction with complex environments (Bruer, 1998). However, Bruer points out that we must

distinguish between *complex* environments (a scientific term describing a wild or natural environment or a laboratory approximation of one) and *enriched* environments (often a value laden term) – we don't have to make every class a juggling act of activities.

Learning takes work. "All evidence, from the laboratory and from extensive case studies of professionals, indicates that real competence only comes with extensive practice" (Anderson, Reder, & Simon, 2000). Students need to practice basic skills and memorize key concepts, in order to succeed at more complicated tasks such as problem solving and critical thinking.

Attention to the task at hand matters – in other words, we have to increase our student's attention to the learning we want them to do, and reduce the distractions around them. To reduce distractions, we need to think about classroom structure, lesson organization, etc – have a consistent plan and routine that cadets expect, so that you don't waste classroom time or cadet attention on non-learning tasks. Increasing attention to the learning task, of course, is the complicated and critical issue – we have to make it interesting and relevant, to keep students engaged.

"Learning takes work ... real competence only comes with extensive practice."

Key Resources

<http://www.imbes.org/> IMBES, and their new journal *Mind, Brain, and Education*, have a mission to "facilitate cross-cultural collaboration in all fields that are relevant to connecting mind, brain, and education in research, theory, and/or practice."

<http://act-r.psy.cmu.edu/papers/misapplied.html> Full-text for Applications and Misapplications of Cognitive Psychology to Mathematics Education by Anderson, Reder, & Simon, at Carnegie Mellon University.

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"We need to be as critical and educated about teaching as we are about our subject matters..."

cational psychology at the Max Planck Institute for Human Development in Berlin, "we need to scale down unrealistic expectations." Key, then, is for us to be informed consumers of educational materials. We need to be as critical and educated about teaching as we are about our subject matters – assessing the source, the strength of the research cited and the theoretical foundation upon which the argument was built, whether or not the article was peer-reviewed, etc.

Cutting Edge MBE Research

The literature indicates that experience interacts with genetics and chance to shape the human brain – and that "the process of education is inextricably linked to neural change" (Ansari & Coch, p. 146). Recent

Technology in the Classroom: When the Afghans Get IT Right, *By*

MAJ Richard Gash, C&ME

Last month my colleague, Major Paul Stanton, used his experiences at the National Military Academy of Afghanistan (NMAA) to reflect on the use of technology in the classroom. When compared to our infrastructure, the Afghan academy's information technology (IT) environment is at best austere. This being said, Paul was impressed by the ability of NMAA's instructors to react to the windstorm knocking out the satellite or the rat eating the network cable. They were prepared to execute each lesson with or without IT. But, even in Afghanistan, IT doesn't fail all the time. Thanks to a lot of hard work by Paul and his predecessors, IT is failing less and less...and when IT works, the Afghans are making the most of IT!



Cadets at NMAA hard at work on the West Point Bridge Designer

During my time at NMAA I was very impressed by the innovative ways the Afghan faculty have leveraged technology in their classrooms—especially considering the level of computer proficiency of the average cadet upon arrival to the academy. Cadets at NMAA come from all over Afghanistan. They represent thirty-three of the nation's thirty-four provinces. Before they enrolled, many had never used a computer. I am sure some had never even seen one. Now they all have Gmail addresses and thumb drives. To them, computers are new and exciting. They provide a window to the wider world and point the way to a prosperous future. The Afghan instructors are able to harness this energy to get their students excited about learning. Interest-

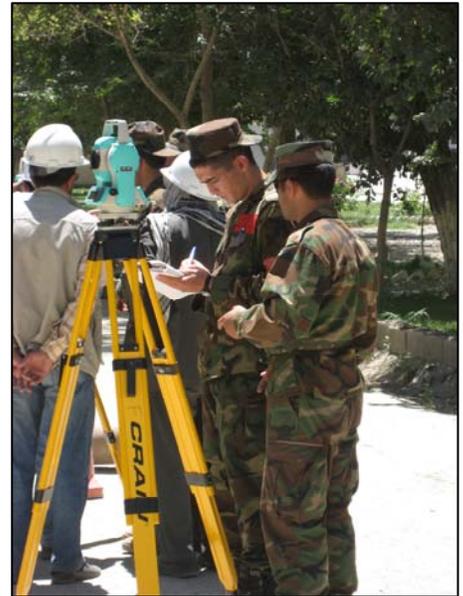
ingly, in the Civil Engineering department, the two tools that are working the best are not expensive software packages. Instead both programs, the West Point Bridge Designer and Google's Sketch-Up can be downloaded off the internet for free.

During their first lessons in engineering the Afghan cadets are introduced to the West Point Bridge Designer. Developed by our own Colonel Stephen Ressler, the program allows users to design and test virtual bridges. The program automatically assigns each design a score based on performance and cost. West Point Bridge Designer's primary target is high school students in the United States. Each year hundreds of kids compete for scholarship money. The program exposes them to engineering and serves as a great recruiting tool for our Academy. If the West Point Bridge Designer is a hit with American high-schoolers, it is a block-buster with the Afghans. The cadets love it and their teachers know it. It's the perfect hook.

The Afghan cadets use Google's Sketch-up in their site engineering class. Sketch-up is a relatively user friendly three-dimensional design and modeling program. I say relatively because it gives me fits. Not so for the Afghans. They quickly master the program by creating graphical models of everything from mosques to their barracks. Once they realize they can draw to scale with the aid of their surveying equipment they need little encouragement for their final project: A virtual model of the NMAA's entire campus. On several occasions I caught the cadets proudly showing Afghan contractors working at the Academy how to use their total station theodolites.

Why are these two computer software packages so successful in Afghanistan? Two reasons: They both have great graphical user interfaces and they are both easy to learn and use. In short, they are fun! The Afghan cadets are hungry for technology. They want an education that will make them relevant in the modern world. Unfortunately their computer skills, and the tech-

nology architecture of NMAA, are not quite ready for professional-quality computer aided drafting platforms. Sketch-Up and the West Point Bridge Designer are a great first step. The Afghan cadets are so excited to use them that may not even realize they are not only forming a foundation for computer literacy but are also doing engineering along the way!



Cadets at NMAA collecting survey data for their Sketch-up model of NMAA

West Point Bridge Designer and Google Sketch-Up are part of our curriculum here in the Department of Civil and Mechanical Engineering. Undeniably, we have cadets who create Sketch-Up models that amaze me every time I see them. Likewise, our top West Point Bridge Designers probably score much higher than the top Afghans. Both programs certainly enhance our cadets' learning. But, they don't seem to have the same shock value here as they do in Afghanistan. Why? I think our cadets expect them. American students have grown up around computers. Information technology has been a part of their education since grade school. It's on us to add the excitement!

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The Science of Education, *continued from p.2*

<http://www.gse.harvard.edu/academics/masters/mbe/index.html> Harvard University scholars founded the IMBES, and Harvard offers a Master's degree in Mind, Brain, and Education. Contains current research projects and articles/interviews from the faculty.

<http://www.teach-the-brain.org/> A comprehensive website about teaching and learning. This site is said to be one of the few legitimate sources of accurate and clear research in cognitive neuroscience and education research.

<http://illinoisloop.org/brain.html> This link is for the Brain-Based Learning page of the website – thoughtful analysis and critique of the pop science articles.

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Additional Reading

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The CTE has 1 new copy of "Lowman" for sale: \$20
(proceeds go to G. Corbari)

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Technology in the CE Classroom, *continued from p.3*

Check out West Point Bridge Designer and Sketch-Up at: <http://bridgecontest.usma.edu/> and <http://sketchup.google.com/>.

MAJ Richard Gash served at NMAA last summer from 19 May to 1 August. His responsibility there was to help develop the CE program. He currently teaches Concrete Design and Soil Mechanics at USMA and next year he will serve as the Dean's XO.

Center for Teaching Excellence
West Point

TEACHING-RELATED REFERENCES FOR ALL FACULTY TO CONSIDER

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Newsletter Submissions

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Submissions to *CTE Today* are welcome and encouraged. When submitting, please keep these guidelines in mind:

- ..We are interested in a wide range of teaching and learning topics.
- ..We are interested in innovative strategies, techniques, and approaches that facilitate learning

..We are interested in reflective analyses of educational issues of concern.

..Write with the understanding that your audience includes faculty in a wide variety of disciplines and in a number of different departments.

..What you describe must be relevant to a significant proportion of USMA faculty.

..Write directly to the audience, remembering that this is a newsletter, not a journal publication.

..Keep the article short; generally between 1 and 3 double-spaced pages.

..If you'd like some initial feedback on a topic you're considering, you're welcome to share it electronically with the editor.