Wednesday
February 16, 2011

SUCCESS IN THE CLASSROOM: SHARING PRACTICES THAT WORK

The Sixth Annual UNM Community Conference for Teachers by Teachers

Abstracts listed alphabetically by first author's last name; not all presenters provided an abstract

Office of Support for Effective Teaching (OSET)

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Methods and Tools to Promote Learning

Fiesta

Session Chairs: James Burbank, English, and Andrea Polli, Art & Ecology

9:00-9:30	Jonathan Eldredge, School of Medicine, Health Sciences Library & Informatics Center, *Our Better Non-Profit Angels: Understanding and Teaching with Open Access Journals*
9:35-10:05	Karla Kingsley, Teacher Education, and John Unger, Transitional Studies (UNM-Gallup), *Increasing Student Motivation and Engagement with Web 2.0 Tools*
10:10-10:40	Samantha Tetango, English, *Teaching Without a Net: An English 101 Blogging Experiment*

Successful Teaching and Learning in Large Classes

Isleta

Session Chairs: Dan Wolne, Religious Studies, and Gabriel Sanchez, Political Science

Dan Wolne, Religious Studies, *Large Class Instruction: Classroom Management, and the Pros and Cons of an Enforced "Quiet Class" Policy*

Gabriel Sanchez, Political Science, *Integrating Active Learning Exercises In Large Sections of Social Sciences Courses*

Gordon Hodge, Psychology, *Use of Undergraduate Students (Peer TA's) as Learning and Teaching Assistants*

10:40-11:00 **COFFEE BREAK – *Acoma A & B***

11:00-11:30	James Burbank, English, *Use the Physics of Sentences to Teach Writing in Your Class!*
11:35-12:05	Howard Waitzkin, Sociology, *Recognizing the Stranger in Paradise*

Aurora Pun, Earth & Planetary Sciences, *Multiple Uses of Clickers Integrated into a Learning Activity Sequence in Introductory Physical Geology*

Robert Tepper, Accounting, *Teaching Coordinated Classes*

12:15-1:30 **LUNCHEON - *Santa Ana A & B***

Keynote Address, Orphaning of the Affective Domain: Our University Tradition of Teaching to Half of the Brain

Dr. Ed Nufer, California State University Channel Islands

1:30-2:15 **Poster Session, Acoma A & B—**see poster titles on the right

Methods and Tools to Promote Learning

Fiesta

Session Chairs: Deana Richter, Teacher & Educational Development, and Laurie Schatzberg, Marketing, Information & Decision Science

2:15-2:45	Lisa Whalen, Chemistry & Chemical Biology, *Impact of Extracurricular Review Sessions on Exam Performance in Organic Chemistry*
2:50-3:20	Laurie Schatzberg, Marketing, Information & Decision Science, *Embedding Authentic Project Work in a Graduate Course*
3:25-3:55	John Unger, Transitional Studies (UNM-Gallup), and Karla Kingsley, Teacher Education, *Video Cameras as Tools for Transitioning from Informal to Formal Writing*
4:00-4:30	Barbara Rousseau, Transitional Studies (UNM Valencia), "*What's Love Got to Do With It?" Teaching Strategies for Lowering the Affective Filter*

Successful Teaching and Learning in Large Classes

Isleta

Session Chairs: Dan Wolne, Religious Studies, and Aurora Pun, Earth & Planetary Sciences

Sushilla Knottenbelt, Chemistry & Chemical Biology, *Incorporating Active Learning into a Large Enrollment First Semester General Chemistry Class: Successes and Challenges*

Monica Cyrino, Foreign Languages and Literature, *Persona & Performance in a Large Lecture Class Setting*

Nancy C. Martinez, English, and Joseph G.R. Martinez, Teacher Education, *Creating Authentic Learning Environments for College-level Courses in Writing and in Teaching Mathematics*

Joseph G.R. Martinez, Teacher Education, and Nancy C. Martinez, English, *Universal Design for Learning as a Model for Teaching Mathematics*

Poster Presentations

Acoma A & B

Margo Collier, Educational Specialties, ***Creating Labs within the College Classroom***

Kevin Comerford, University Libraries, ***Open Access at UNM: How Moving from Print-Based to Electronic Publishing Can Extend the Reach of Your Research***

Laura Crossey, Earth & Planetary Sciences, ***Modeling to Learn: Classroom Use of Complex Models to Stimulate Learning***

Jonathan Eldredge, School of Medicine, Health Sciences Library & Informatics Center, Toby Palley, Ellen Cosgrove, and Cynthia Arndell, School of Medicine, ***Integrating Evidence-Based Practice (EBP) Knowledge and Skills into a Medical School Curriculum through a Credit Course***

Charlotte (Lani) Gunawardena, Heather Mendoza and Linda Barril, Educational Leadership & Organizational Learning, ***Transitioning to Online Teaching: Two Instructional Design Models for Open-Ended and Structured Learning Outcomes***

Majeed Hayat, Electrical & Computer Engineering, and Gary A. Smith, Office of Support for Effective Teaching, ***Small Group Instructional Diagnosis: Generating Reflective and Meaningful Feedback from Students When it Counts***

Holly Hitzemann, Organizational Studies, ***Achieving Course Objectives via Engaging Interactive Virtual Technologies, Assets, and Assignments***

K. Joseph Ho, Wilson Ngambeki William, Chemistry & Chemical Biology, ***An Experience and Analysis of Using Calibrated Peer Review™ (CPR) in the General Chemistry Laboratory Course***

Christopher Holden, Alyssa Conscha, and Kaylyn Peters, Honors Program, ***Local Games in Albuquerque: Studying the City Using Place-Based Mobile Game Design***

Vicky Kauffman, Mathematics & Statistics, ***Projects in Life Science Calculus***

Troy Lovata, University Honors, ***Successfully Walking Out of the Classroom: Notes on Integrating Hiking into the Curriculum***

Heidi Roeber Rice, Internal Medicine-Epidemiology, ***The Utility of a Wiki in Creating Enduring Resources to Enhance Graduate Medical Education***

Gary A. Smith and Shannon Belle Bermea, Earth & Planetary Sciences, ***Using Concept Sketches to Recognize Student Misconceptions Persisting from Prior Instruction***

Stephen Wood, Cell Biology / Undergraduate Medical Education, ***Use of Confidence Based Marking to Improve Learning in Medical School***

An Interactive Learning Approach: Exploration of the Classroom as Laboratory

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The use of clickers in college has been growing over the past decade. The use of this technology in higher education has taken place primarily in large undergraduate lecture classes. Extensive studies have been done on clicker-enhanced pedagogies in large introductory science classes. However, little research has been done on the effects of clicker potential in small, non-science graduate courses.

Peer instruction is a student-centered approach to teaching that has demonstrated effectiveness in university settings. When contrasted with traditional lecture methods, students' conceptual understanding and problem solving skills showed significant increases through research done at Harvard University. Peer instruction provides the opportunity for students to engage their peers in active-learning strategy far more than passive-learning strategies such as lectures. Posing "clicker questions" that require that all students commit an answer can increase student investment in subsequent discussion. Discussion with classmates of clicker questions gives students a chance to construct knowledge through debate and discussion with their peers.

An existing assessment course has been redesigned into a laboratory of exploration using peer instruction. The course trains graduate-level student teachers to administer K-12 classroom tests. This project integrates interactive technology of classroom response systems ("clickers") and the pedagogical strategy of peer instruction to enhance student conceptual understanding of course material. Comparison will be conducted between a class taught in the spring semester without the use of clickers and the same class taught in the fall with the use of clickers. Results will determine whether peer instruction using clickers increases learning outcomes.

For students, clickers are easy to use and offer a quick way to give the instructor feedback about their learning. The immediate feedback that clickers provide can assist students to identify areas that they do not fully understand and would like further explanation. Clickers can facilitate student participation through a concrete method of interaction. The value of enhancing students' cognitive and affective engagement through this technology is potentially profound, and the scope of impact will be among the results assessed.

For faculty, the use of clickers in the classroom is a relatively easy technology to adopt. It provides rapid evaluation of student mastery on course content. Due do the immediate feedback that clickers provide, instructors can identify misunderstandings of concepts and present instruction in an alternate way to enhance increased learning. The use of clicker technology can assist instructors to pinpoint areas in their instruction that require further development, thereby assisting them to make adjustments and fine-tune their course in a timely fashion and enhance the quality of their teaching on an on-going basis.

Transitioning to Online Teaching: Two Instructional Design Models for Open-ended and Structured Learning Outcomes

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As the demand for online courses continues to grow at UNM, many instructors who have no prior experience with distance learning are being asked to adapt their courses to an online learning environment. This poster session presents two instructional design models that can be used to develop online courses that either meets the needs of more open-ended, or structured learning outcomes.

The WisCom instructional design model that we developed (Gunawardena et al. 2006) and used to develop online graduate courses at UNM, can be adapted to build a learning community online if the learning outcomes are open-ended and require the exchange of multiple perspectives, problem solving, and knowledge construction. Based on socio-constructivist and sociocultural theories of learning and distance education principles, WisCom specifies three components that must be facilitated to create a wise community: (1) a cohesive learning community; (2) knowledge innovation - providing opportunities for reflection, sharing of perspectives, knowledge construction and preservation within the community, and (3) learner support and mentoring to achieve learning goals. The Cycle of Inquiry module design mirrors authentic learning, and starts with a learning challenge, which can be a question/issue/problem/case to be addressed, moving the learner through a process of exploration, gathering and sharing resources to address the question, discussing them with peers to learn from multiple perspectives, and concluding with the creation of a knowledge artifact (such as a summary or concept map), that addresses the question/issue/problem/case, or a personal reflection of the learning experience in a journal. We will demonstrate UNM courses that have been designed using this model.

Courses that have more structured learning outcomes can be designed adapting the OnCourse instructional design model that we developed. Through the use of modeling, coaching, exploration, and assessment, the OnCourse model provides an instructional design framework that can be used by instructors to translate their face-to-face, traditional classroom courses into online course management systems. The OnCourse Model draws upon cognitive apprenticeship theory and multimedia theory to provide an effective guide to online course development. This model can also be utilized by instructional designers seeking to create online courses based on content originally developed for a face-to-face classroom setting.

Gunawardena, C. N., Ortegano-Layne, L., Carabajal, K., Frechette, C., Lindemann, K., Jennings, B. (2006). New model, new strategies: Instructional design for building online wisdom communities. *Distance Education*, 27(2), 217–232.

Small Group Instructional Diagnosis: Generating Reflective and Meaningful Feedback from Students When it Counts

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Small Group Instructional Diagnosis (SGID) is an interactive method for performing assessment of students' learning by actively engaging students to help their instructor improve their course. The key features of SGID are the following. First, it protects the privacy of both students and the instructor; second, the feedback is the result of group discussions amongst students; and third, the process is performed early in the term when there is time for the instructor to make changes to improve the course. SGID has been used since the 1980's by many instructors in many institutions nationwide. This paper aims to show the benefits of this effective method for assessment in hopes of promoting and widening its use by all instructors at UNM.

The SGID process involves a facilitator, a colleague from a different department than that of the instructor, who presents (upon the request of the instructor) three questions to the class: (1) what do you like most about this class and class instruction? (2) what do you like least about this class and class instruction? and (3) what suggestions do you have for your instructor to improve your learning? What is different about SGID from traditional end-of-the-term evaluations is that the process actively engages students in small-group discussions addressing the three aforementioned questions. The fact that students have a chance to discuss their thoughts amongst each other is extremely effective in generating meaningful and constructive feedback. Since SGID is typically conducted before the midpoint of the term, the instructor will have ample time to learn from the feedback and improve his/her instruction in the very same course! It is not surprising that we have found students to be very appreciative of the effort that the instructor puts in getting and addressing their concerns.

Another key feature of SGID is that it allows students to provide extensive, consensus-based feedback while protecting their privacy fully. The process calls for the facilitator to write a summary of the comments that result from the SGID discussions. All other written documents or forms generated during the SGID process are destroyed by the facilitator. Meanwhile, the privacy of the instructor is equally protected: under no circumstances the results of SGID are made available to any person other than the instructor. SGID is simply a means to assist the instructor in improving the effectiveness of his/her teaching and it is not intended for use as a tool to evaluate the instructor by his/her peers or superiors.

All in all, it has been our experience that students are often impressed that their instructor is making a genuine effort to listen to their views and is seeking to make meaningful changes to improve the course and their learning. SGID gives students a chance to participate in their own learning and enhances their level of trust in the professor and the course.

Achieving Course Objectives via Engaging Interactive Virtual Technologies, Assets, and Assignments

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Achieving course objectives and pinpointing areas of specific student learning is challenging in all environments – but particularly in large classroom settings. Specific enhanced learning outcomes utilizing interactive virtual technology and assignments can be achieved through team assignments and on line discussion. The poster presentation authors portray three successful assignments used in marketing and management courses. A fourth assignment model utilizing new interactive quizzes which self evolve to each student was also shown. This new on-line tool will be available in Spring, 2011.

Sell That Car

"Sell That Car" employed the mail feature in a web enhanced course to simulate a virtual sales experience. The students were required to respond to an initial email requesting auto information, and had three email chances to commit the potential customer (the instructor) to a test drive. All students participated, and the tactics used demonstrated their grasp of selling techniques. 90% of students employed at least three relationship building tools in their approach – a key learning outcome in the Sales course. The assignment also provided a personalized assessment of each student in lieu of a multiple choice final exam.

Watch the World

"Watch the World" asked teams of students to research a current event, and report either online or in class on the relevance of this event to two course concepts. In a very large classroom setting, this activity resulted in 100% class participation, bonding of students into working groups, instructor classroom assessment of concepts grasped, and overall excitement by the students for the course content. 100% of the presentations were timely, relevant, and revealed grasp of at least two course objectives. An additional outcome of this activity was to encourage student reading outside the classroom and enhance awareness of current events.

Ice Cream Dream

Students were directed to the Ben and Jerry's web site and use a preset product development model to create a new flavor. All students enthusiastically and creatively participated, and demonstrated a solid grasp of the product development process and the nuances of mass customization, brand, and product differentiation.

Feasibility Studies of Using Calibrated Peer Review™ (CPR) in the Large General Chemistry Laboratory Courses

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In a chemistry laboratory course, we expect our students not only to learn lab techniques, but also to practice technical writing and critical thinking. The pedagogical principles of Calibrated Peer Review seem to address the need of these objectives of our lab courses. In addition, engaging students in peer reviews for their laboratory reports can reduce the burden of grading for instructors or TA in a large laboratory course. This report is the result of three semester's investigation for the feasibility and effectiveness of introducing CPR in large introductory chemistry lab course (CHEM 123L). The effectiveness of using CPR to improve students' performance in the report writing was studied between two randomly selected groups by giving a CPR assignment to the CPR group and no CPR assignment to the control group. The performance was analyzed by comparing the differences of the grades from post-lab reports between the two groups throughout the semester. It was found that students in the two groups showed significant performance difference in post-lab report writing after the implementation of CPR assignment, indicating CPR might have been one of the factors causing improvement in student's report writing. However, the study also found CPR is difficult to manage for large courses because of the long problem lists and poor instructor's controls. The students found the review process frustrating because they could not have confidence to give and receive proper and consistent reviews after a short training from the calibration. The instructors had to manually review large portion of students' reviews and override students' ratings to make grades fair, defeating the purpose of reducing instructor's grading burden. In our conclusion, although the pedagogical objectives of CPR are useful for improving students' writing skills, the current CPR program needs to be redesigned to make the peer review more effective and beneficial for our students.

Use of Undergraduate Students (Peer TAs) as Learning and Teaching Assistants

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General Psychology (PSY105) has an annual enrollment of more than 2,800 students (including 200 online students) and three instructors. Five graduate TAs ably assist us, but the nature of the course and the number of students who take it would overwhelm us without help from undergraduate Peer TAs.

The course requires students to master 3 weekly sets of multiple, randomly generated WebCT quizzes, which upon satisfactory completion, allow them to take corresponding chapter tests; there are 48 sets of quizzes and 16 chapter tests per semester. Although most students master the technical demands of the course, 20 percent (600 students) run into problems. Over a semester, we receive over 10,000 emails, virtually all of which deal with procedural questions (e.g., where are the quizzes?). And this same population of students has problems learning course content, as well.

To assist instructors in answering emails and improving student performance, near the end of each semester I recruit 20 or so “A” students to assist us in the upcoming semester. I interview prospective Peer TAs that accept the invitation and outline what they will be asked to do: attend an orientation meeting before classes begin and, thereafter, weekly 2-hour meetings; hold 5 office hours per week, during which they meet with students who are struggling in the course; proctor all lectures; and, significantly, respond to student email. Peer TAs sign up for PSY250 or 450 Special Topics sections (Teaching of Psychology) and receive 3 hours of credit.

Having performed well in the course previously, Peer TAs—representing diverse populations—understand the procedures required and, more importantly, have a desire to help other students. Nevertheless, they typically are not prepared to interact with students who often have very different reasons for taking the course than they had. During weekly meetings, we discuss issues that have come up the previous week and review techniques for helping students improve performance. The feelings of Peer TAs toward students often arcs between wanting to help everyone, to resentment toward all those students who say they’re going to come in and then don’t (or are going to change but don’t), to an appreciation that the personal rewards of this type of service usually come down to a few students who improve, and the recognition that it was their direct involvement and efforts that helped bring about the improvement. In a larger sense, the Peer TAs help many students in many ways.

I expect a great deal from our Peer TAs and each semester I am routinely amazed at their level of commitment and professionalism. They learn something about what it takes to influence other people for the better, and because of the active involvement of these remarkable students we are able to continue teaching the course.

Local Games in ABQ: Place-based mobile game design as research method

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> "The brainstorming process was just as important as the games that we produced, one of the best parts of the class. It got me thinking in new ways that I had never really had the opportunity to before. Now that I have those skills I realize how valuable they are. I don't doubt that I'll continue to hone them."
>
> —Alyssa Concha

In this class, students used place-based game design as a lens to focus on important issues within their surroundings, and ARIS open-source software to create interactive place-based content on mobile devices. Students pushed themselves to reach out to new and larger audiences beyond the classroom, also becoming part of an international community of ARIS authors, exploring the frontiers of mobile media. They contributed to the software itself, enabling the community to produce new and better designs.

Students worked through an iterative and collaborative production process including creative brainstorming, trial and error, and good old library research. Students considered not only the logistics of creating a game, but also the challenge of creating content appealing to their audience. The class offered many new ways to understand, perceive, and portray places and issues that were important to the students.

Some designs have potential to make an impact outside this course. They represent partnerships between the students and diverse stakeholders. Some started large, while others grew out of simple design scaffolds, a familiar context for the technical and cognitive challenges of mobile game design. Working for a client outside the classroom on a dynamic project that could live beyond one semester increased motivation; several of the students are now committed to continued work with ARIS and have already introduced it to new potential designers.

A few characteristics of this design-based pedagogy:

- Learning directed to high-end goals.
- Just-in-time instruction distributed among participants.
- Learners' previous experiences never assumed but always leveraged.
- Work reaches outside the classroom.
- Many types of expertise needed.
- Student driven: Course content created not covered.
- Strong collaboration among a distributed team of interested participants.

Increasing Student Motivation and Engagement with Web 2.0 Tools

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In this workshop we describe a variety of Web 2.0 tools we have used as teacher educators and have seen effectively used by teachers in K-20 classrooms. We provide concrete examples of how these tools have helped our students create knowledge to meet academic outcomes while working together to investigate complex ideas through the application of higher-order thinking skills. These technology-mediated tools can provide the basis for lessons drawn from real-life situations that require students to apply skills in practical reasoning, critical thinking, and research.

Web 2.0 is a collection of online tools that let users create, edit, share, discuss, engage, collaborate, and communicate in meaningful ways. This workshop introduces attendees to free open-source Web 2.0 tools to enhance teaching and learning in the content areas, including wikis, blogs, social networking, screen casting, and digital storytelling. Workshop attendees will learn about technology tools for assessing students' understanding, while learning ways to share information, collaborate, and communicate. Handouts and ideas for classroom integration will be provided.

Bibliographic information

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Kingsley, K.V., & Brinkerhoff, J. (in press) Web 2.0 for authentic instruction, learning, and assessment. *Social Studies and the Young Learner*.

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Solomon, G., & Schrum, L. (2007). *Web 2.0: New tools, new schools*. Eugene, OR: International Society in Education.

Incorporating Active Learning into a Large Enrollment First Semester General Chemistry Class: Successes and Challenges

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Chem121 has earned the dread-inspiring label of 'killer course', one having drop-fail-withdraw rates consistently higher than 20%, and often above 40%. Within the department, there is ongoing discussion on why students find this class so challenging, and considerable motivation to find solutions. Traditionally, the class has been taught in a large enrollment lecture setting, often with a component of online homework. After attending the OSET Course Redesign Institute, I became convinced that student learning could be improved by actively engaging the students, using class time to work through problems that required a higher level of thinking. The Institute suggested a set of methods and tools that would enable this active learning, even in a large class.

The structure of the redesigned course: To make time in class to tackle higher order thinking problems, first contact with the material, and acquisition of the basic facts and simple concepts was moved to before class.
Before class: a reading assignment from the textbook and/or weblinks which I assessed by a low stakes reading quiz, administered in WebCT. I coupled this with a 'muddy point' question, requiring the students to identify the most difficult or interesting concepts in the reading, to guide my lecture, the next day.
In class: Class time consisted of traditional lecture, in-class exercises and clicker questions with peer instruction. During the in-class exercises, the learning team (myself, TA, SI leader and the three Peer Learning Facilitators (PLFs funded through a Walmart/Title V grant)) worked with groups in the class.
After class: an artificially intelligent online homework system ALEKS was used to give the students extra practice. Help sessions and office hours were provided.

The challenges: Designing in-class exercises of an appropriate level of difficulty proved to be a big challenge in this large ability range class. Some students managed to avoid working in groups at all, decreasing the efficiency of the method. The pre-class assigned work was often more difficult for students than I expected, and often required attention in class, slowing the pace.

The successes of the implementation: I observed a significant shift to higher grades between my spring 2010 121 class (taught in traditional lecture style) and my fall 2010 class, although an identical drop rate. There are significant other factors that may have contributed to the difference: most importantly, the implementation of a 'parachute' course to help students with insufficient background, but also student differences between spring and fall semester. In a survey, the student response was very positive, despite the large amount of prescribed work. The students strongly preferred a class structure with more interaction (clickers etc), and recognized the benefit of the pre-class work.

Universal Design for Learning as a Model for Teaching Mathematics

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Universal Design for Learning (CAST, 2009) has provided a model for teaching just about any topic from any discipline and making those topics more accessible for all learners. We have developed a version of the model called Universal Design for Learning Mathematics (Martinez & Martinez, 2007). This version expands the traditional UDL guidelines and proposes developing curricula and pedagogy that make assessment an integral part of our model.

This model provides a framework for learning based on multiple means of engagement, multiple means of representation, multiple means of expression, and multiple means of assessment. We have used our model to develop lessons in sports math and other areas for Grades 6-12 and at the college level to apply the Principles of UDLM (Universal Design for Learning Mathematics) to developing mathematics pedagogies for teachers. We focus on how to apply the 7 Principles of Universal Design (Burgstahler, 2009) and our UDLM model for teaching mathematics including teaching specific concepts.

Overall the Universal Design model broadens the "what," "why," and "how" of learning without changing objectives or performance standards. It can assist us as educators to "reduce barriers to learning and provide robust learning supports to meet the needs of all learners" (CAST, 2009, p. 2).

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Creating Authentic Learning Environments for College-level Courses in Writing and in Teaching Mathematics

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The importance of creating authentic learning environments has been well established (see Long, 2009). When learning parallels or impacts real-world situations, students will examine problems from multiple perspectives, commit a significant amount of time and resources to complete tasks, and produce a finished product or draw conclusions that have significance outside the classroom.

Much of the research about authentic learning has emphasized science and mathematics, but the approach is also valuable to teach writing. Specific examples are drawn from mathematics methods, college writing, and technical and professional writing courses. In mathematics methods classes, students measured circular objects in a hands-on activity to discover pi and experimented with containers of water to solve the classic water-jar problem. In a college writing course students analyzed audience and rhetoric in extended definitions of patriotism written by competing presidential candidates. In the technical and professional writing class, students researched and produced brochures and travel articles that promoted events, products, organizations, or attractions throughout New Mexico.

The example activities encourage students to integrate content from different disciplines and result in a diversity of outcomes—key characteristics of authentic-learning experiences (Harrington, Oliver & Reeves, 2003). Students develop the flexibility needed to apply learning in a variety of contexts, the ability to recognize patterns in unfamiliar situations, and the patience to work through complex and multi-step problems (Oblinger, 2007).

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Oblinger, D. G. (2007, May). Authentic learning for the 21st Century: An overview. Retrieved January 23, 2008 from the Educause web site: http://www.educause.edu/ir/library/pdf/ELI3009.pdf.

Multiple Uses of Clickers Integrated into a Learning Activity Sequence in Introductory Physical Geology

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Clickers are part of a learning-activity sequence (LAS) (Pun & Smith, 2010) that integrates in-class instruction with structured out-of-class learning in introductory nonmajors physical geology classes (enrollments 90-130). The LAS combines online and in-class learning and assessment: Reading quizzes before, active learning during, and learning assessments after class.

The key learning principles on how students learn (Bransford et al., 2000) indicate that knowledge is associative. What students hear and learn in a classroom is linked with what they might already know and understand and this includes any prior misconceptions. Learning that is productive is also constructive, indicating that it requires mental effort and that most humans require some social interactions in order to learn deeply and effectively. Lastly, learners must develop metacognition to take control of their own learning. I link the key learning principles with the LAS and the use of clickers.

The pedagogy of clicker use is multi-modal, with varied uses serving different purposes within the LAS and link to the key learning principles while providing variety to classroom activities for students. Clickers are employed in three ways during class. (1) Questions assess fundamental learning from assigned reading that is applied during an upcoming lecture tutorial (in-class, small-group or individual assignment). This use of clickers provides an incentive for reading before class (because of low-stakes grading of responses) and permits the instructor to employ just-in-time instruction to strengthen student understanding of poorly-grasped concepts. (2) Questions following a lecture tutorial assess individual learning from the small-group assignment and remove the need to collect and review large numbers of papers as a formative assessment of student learning. (3) Peer instruction (Mazur, 1997) is utilized during lecture segments to engage students with presented material and assess their understanding before moving on. Peer-instruction is sometimes used with approaches 1 and 2 when the initial percentage of correct student answers is unsatisfactory.

The effectiveness of clicker use cannot be isolated from the overall LAS approach. Nonetheless, 80.5% of 379 students anonymously surveyed over 5 semesters indicate (strongly agree, agree) that clickers help them understand a concept. A large majority (81.8%) claim that they would attend class to use clickers and participate in other in-class activities even if these activities had no point value because of the learning value associated with their use. Success may also be indirectly measured as these course sections had the highest percentage of students receiving a grade of C or higher (80% overall) among all of the sections offered. Students also demonstrated 73-96% competency in achieving stated learning outcomes for the course.

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"What's Love Got To Do With It?" Teaching Strategies for Lowering the Affective Filter

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Purpose: Traditional teaching methodology advocates a lock-step delivery of content, student practice, and checking for cognitive understanding. This type of instruction truncates the practice of integrating the affective component of learning. Classrooms in which students feel unacknowledged, unsupported, and unheard are stressed, to varying degrees, in their learning process. The affective filter blocks the emotional and mental propensity for learning. When this "safety filter" is lowered, the capacity for learning expands. Simply, students learn more readily when they feel comfortable, sense that it is safe to take risks, and know they are accepted (Krashen, 1987).

These findings coupled with Robert Marzano's (2001) effective teaching strategies provide a dynamic instructional combination for student engagement. Rich classroom environments are further enhanced by the instructor's supportive nonverbal cues.

Results: When integrating affective and cognitive domains within the lesson (content) and approach (context), instructional relevance is enhanced. In a rural New Mexico alternative school struggling to meet the mandated federal goals of Adequate Yearly Progress, the speaker implemented a cognitive/affective integrated instructional approach. Dramatic observable results with these at-risk, special needs students, and English Language Learners demonstrated higher retention and academic improvement.

Conclusion: This presentation showcases an example of an effective lesson plan blending cognitive and affective content within the context of interpersonal and empathetic instruction. Educators need only slightly adapt existing lesson plans to incorporate affective relevance and intentional empathy for a richer classroom climate.

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Embedding Authentic Project Work in a Graduate Course

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An academic course in project management faces the dual challenge of imparting foundation concepts and principles while providing a meaningful context within which students can experience projects in real time. Like many skills-based disciplines, project management is a combination of science and art; the science can be mastered by traditional academic study, while the art is much more challenging to develop in the artificial structure of a 16-week course.

In Fall 2010, we introduced two new techniques to Anderson's MBA course in project management: simulation and professional mentoring. SimProject®, the simulation software, includes eleven simulated weeks of a web-site prototyping project. Students worked in small teams to plan, make decisions, and respond to periodic "uh oh's" presented to them during each of the simulated weeks. They also wrote brief reflection papers throughout this period.

For professional mentoring, we identified certified project managers from the Rio Grande Chapter of Project Management Institute. These professionals volunteered their time to mentor the same small teams of students. Mentoring included discussions, tours, and meeting participation whereby students gained a deeper understanding of the application and limitations of their textbook and case study materials.

In this presentation, we'll consider the faculty perspective on the strengths and weaknesses of these approaches as well as the feedback from the students and the community mentors.

Using Concept Sketches to Recognize Student Misconceptions Persisting from Prior Instruction

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Plate tectonics, a fundamental theory in geoscience, is taught at various times in K-12 curricula and in first-year college courses. Should instructors assume that certain basic conceptual knowledge exists by the time students reach a second college geoscience course? We used concept sketches (Johnson and Reynolds, 2006) to investigate students' conceptual understanding of plate tectonics in EPS 201L, Earth History. Concept sketches are simple student-drawn sketches that are concisely annotated with processes and labels of features. Over the course of five years, 149 students completed an in-class assignment where they drew concept sketches of plate boundaries with required annotations. Analysis of the sketches revealed eight common misunderstandings about essential aspects of plate tectonics. Rather than assuming students have a correct understanding about plate tectonics after their introductory course(s), most students demonstrate incomplete or incorrect understanding of the most fundamental processes and features explained by plate tectonics. Identifying misconceptions about plate tectonics allows for adjustment in instruction to address weaknesses in student's conceptual knowledge before moving forward with applications of the theory.

We hypothesized that variability in the frequency of misconceptions among students corresponded to general geosciences conceptual knowledge, nature of prerequisite course work, or both. We evaluated general conceptual knowledge by students' scores on the Geoscience Concept Inventory (GCI; Libarkin and Anderson, 2005), which students completed at the beginning of EPS 201L. We also compared misconception frequencies to whether students previously completed EPS 101, ENVS 101, or both as a prerequisite to EPS 201L; EPS 101 classes typically include more time for and more rigorous instruction of plate tectonics theory. For 7 of the 8 concepts, students who completed both courses had the fewest misconceptions, followed by those who only completed EPS 101; students who only completed ENVS 101 demonstrated the most misconceptions. Although consistent with the hypothesis, most of these differences are not statistically significant. However, students who completed only EPS 101 scored significantly higher on the GCI than students who completed only ENVS 101. In addition, for all 8 concepts the students who demonstrated misconceptions also scored significantly lower on the GCI than those that did not. Therefore, variability in conceptual understanding of the most fundamental geological theory is related to overall mastery of geosciences concepts, which is partly related to preceding course work.

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Teaching Coordinated Classes

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Which instructor should I take? It might make less of a difference than students think. Many large-enrollment, undergraduate courses are taught using a coordinated approach: a coordinator develops a common syllabus, exams, and supplementary materials, and oversees all of the sections which are taught mostly by others. Since 1992, the first financial accounting class at the Anderson School of Management has been coordinated. The primary advantages attributed to coordination are an emphasis on course design, procedural consistency among sections, coverage of the same material, and a consistent level of difficulty. This presentation addresses the coordinated approach both from the perspective of a department considering adopting a coordinated approach for a course as well as from the perspective of the coordinator. For departments considering a coordinated approach, it discusses the advantages and disadvantages of coordination, the steps in implementing coordination effectively, and the potential pitfalls in the implementation process.

From the perspective of a coordinator, the presentation then moves to ideas that have been used most successfully in the coordinated program and how to make changes. Finally, it addresses common frustrations experienced by coordinators (and how to minimize them). The presentation concludes that a coordinated program can offer significant advantages and contribute to student satisfaction with large classes.

Teaching Without a Net: Blogging in English 101

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UNM's English Department emphasizes the importance of the rhetorical situation in any given piece of writing. In the past, I've had students write for hypothetical newspapers, magazines, publishers and more, all as an attempt to have them write for a world outside of the classroom. But students are not stupid. No matter what you tell them (you are a reporter for the *Daily Lobo*, you are a prospective student looking for a job, you are an alien from Mars trying to make contact with an earthling, etc.), they never forget that the scenario is a fabrication. I may say their audience is the entire UNM student body, but no one ever forgets they are writing for me, their teacher.

In my experience, students who write for the teacher are often writing only for a grade. Often this means doing the minimum required to get the work done and their effort level is reflected in truncated language with truncated thoughts, the "I am writing this because I have to" evident from every quickly scribbled sentence and incorrectly spelled word. Furthermore, they had difficulty grasping the idea of writing for a specific audience. Enter the blog. A genre that can be both written and read by just about anyone.

Due to Facebook, youTube, Twitter, and other popular forums, the language of our current freshmen is the language of the internet. It is short, it is visual, and it blossoms under a wide, communal audience. All of these are components of the blog where students have the freedom to gauge their level of disclosure as they share their insights and opinions, provide links to videos or photographs, and receive feedback from friends, classmates, and—most importantly—complete and total strangers. While addressing an open audience provided an added teaching challenge, I found that my students' writing exponentially improved. (After all, their friends, parents, and even future employers might read it!) In the end, many of my students came to understand that, like a fancy suit, the words we write can and are a reflection of who we are. As a result, they generated the best freshmen writing I had ever seen.

This presentation will discuss this blogging experiment, the problems I encountered over the course of the sequence, and the writing the blog generated from my students.

To view the blogs, please visit: http://samandsusan.wordpress.com/

Video Cameras as Tools for Transitioning from Informal to Formal Writing

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In this session participants will learn to use flip-video cameras to produce brief (one to two minute) presentations of main idea and supporting details from academic text. Transition words and phrases to explain the relationships between main ideas and supporting details will be emphasized. Participants will engage in hands-on work with flip video cameras, poster paper and marker pens as they learn strategies to enhance students' ability to make sense of academic text structures and subject area information. Participants will receive handouts outlining appropriate assessment procedures for the activity. Participants will also be provided with online resources to assist them in adapting the entire process for their own educational contexts and students.

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Recognizing the Stranger in Paradise

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This presentation addresses two questions that grew from my life experiences as a student and teacher:

- How does a teacher cope with a sense that she is a stranger in educational institutions?
- How does a learner learn best when he feels like a stranger, in an educational environment where one longs to thrive and to make a mark?

These questions focus on the needs of learners who feel alienation within academia, partly due their roots in families and communities characterized by poverty and limited educational opportunities.

In trying to answer these questions, I describe six principles that guide my work:

- The first principle is safety. The safety that I emphasize comes from a realization that a person can express her or his deepest and most private experiences, ideas, ideals, and aspirations and can receive support, recognition, and constructive feedback, rather than criticism, belittlement, or ridicule.
- The second principle involves connection to passions. When learners request advice, I ask, "How is that connected to what you feel passionate about?" I try to guide people along a path determined by their passions, rather than by opportunities, requirements, or standard procedures.
- A third principle is fostering voice and vision. I encourage learners to find their own unique voices and to develop a tentative vision of their paths in life and work.
- Fourth, I try to push the boundaries of customary expectations. This principle suggests raising the bar for students' performance beyond usual expectations about what is possible at a certain age.
- A fifth principle involves hands-on creative experiences in communities. I have encouraged or required students to leave the somewhat artificial environment of the campus and to immerse themselves in activities that help them understand the "real-life" challenges that people face, living and working in our society.
- The sixth principle is learning from learners. Teaching is a tremendous privilege. I try to take advantage of this opportunity with every learner I encounter.

(The Presidential Teaching Fellowship at the University of New Mexico, the University's highest teaching award, provided partial support for this presentation at the conference.)

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Seven Principles for Good Practice in Undergraduate Education

(excerpt from, Seven Principles for Good Practice in Undergraduate Education, by Arthur W. Chickering and Zelda F. Gamson *AAHE Bulletin,* Mar 1987)

Good practice in undergraduate education:

1. Encourages Contact Between Students and Faculty

Frequent student-faculty contact in and out of classes is the most important factor in student motivation and involvement. Faculty concern helps students get through rough times and keep on working. Knowing a few faculty members well enhances students' intellectual commitment and encourages them to think about their own values and future plans.

2. Develops Reciprocity and Cooperation Among Students

Learning is enhanced when it is more like a team effort that a solo race. Good learning, like good work, is collaborative and social, not competitive and isolated. Working with others often increases involvement in learning. Sharing one's own ideas and responding to others' reactions sharpens thinking and deepens understanding.

3. Encourages Active Learning

Learning is not a spectator sport. Students do not learn much just by sitting in classes listening to teachers, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences and apply it to their daily lives. They must make what they learn part of themselves.

4. Gives Prompt Feedback

Knowing what you know and don't know focuses learning. Students need appropriate feedback on performance to benefit from courses. When getting started, students need help in assessing existing knowledge and competence. In classes, students need frequent opportunities to perform and receive suggestions for improvement. At various points during college, and at the end, students need chances to reflect on what they have learned, what they still need to know, and how to assess themselves.

5. Emphasizes Time on Task

Time plus energy equals learning. There is no substitute for time on task. Learning to use one's time well is critical for students and professionals alike. Students need help in learning effective time management. Allocating realistic amounts of time means effective learning for students and effective teaching for faculty. How an institution defines time expectations for students, faculty, administrators, and other professional staff can establish the basis of high performance for all.

6. Communicates High Expectations

Expect more and you will get more. High expectations are important for everyone -- for the poorly prepared, for those unwilling to exert themselves, and for the bright and well motivated. Expecting students to perform well becomes a self-fulfilling prophecy when teachers and institutions hold high expectations for themselves and make extra efforts.

7. Respects Diverse Talents and Ways of Learning

There are many roads to learning. People bring different talents and styles of learning to college. Brilliant students in the seminar room may be all thumbs in the lab or art studio. Students rich in hands-on experience may not do so well with theory. Students need the opportunity to show their talents and learn in ways that work for them. Then they can be pushed to learn in new ways that do not come so easily.