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The Faculty Development Program

The Faculty Development Program supports faculty at Santa Clara University as teaching scholars. Programs and services promote two general goals:

- To enhance the professional development of Santa Clara University faculty.
- To explore how students learn and to support faculty in cultivating student learning.

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In This Issue

Getting Your Students Beyond Google in Research Assignments: Ten Tips for Using SCU's Library Databases

Gail Gradowski, University Librarian and Diane Jonte-Pace, Associate Provost

For many students Google is the "default" search engine. Google always produces results although it rarely leads to scholarly material. Some professors have developed assignments in which students in groups conduct a search using both Google and a library database. Students then compare and evaluate the information gathered in the two searches. Not only does the assignment help students learn course content, but it also promotes information literacy, alerting students to the limitations of Google as a research tool.

Many students, however, do not know how to use SCU's library databases. Here are ten tips for searching these library databases and getting beyond Google in research assignments. Please feel free to use, adapt, or share these tips with students.

1. Start at the Library Homepage, www.scu.edu/library/ Select "Electronic Databases" and choose a database in your subject area.

2. Typically you'll see three boxes (a 3 search box grid). You don't have to use all three boxes. Using two will give you more information. Using three will narrow the search.

3. Put one idea or keyword into each box (one word or one phrase). Don't use a phrase when a word will suffice (*media* is better than *mass media*).

4. If this produces no results, simplify your search by using two boxes instead of three, or try different (but similar) keywords (*automobile* instead of *car*, *adolescent* instead of *teenager*).

5. If your search produces too many results, look at your limiting options in the database—dates, languages, formats (just search for journal articles, for example)— or use all three boxes. You can also use the pulldown menus adjacent to the search boxes to search in the SUBJECT field only.

Continued on page 3

Zen and the Art of Teaching: Critical Thinking and the Uncritical Mind

Sarita Tamayo-Moraga, Lecturer, Religious Studies

As a practicing Catholic who has meditated in the Soto Zen tradition for eight years, I try to bring awareness of the present moment into my life through attention to breath and body, and through the cultivation of "*not-knowing*" and "*not-attaining mind.*" Recently I've begun to apply these practices to my teaching. Doing so has had unexpected pedagogical results: deep learning and critical thinking for my students, and relief from perfectionism for me.

Observing my breath while simultaneously speaking, writing on the board, and listening to students, seemed jerky and artificial at first. However, the practice soon became more fluid, and I began observing sensations more precisely and mindfully: the feel of a sheet of paper with my lecture notes, the muscles I use to write on the board, the sound of my voice in my chest, and the sound of my students' voices.

Through these practices I began to create a tolerant, uncritical awareness in the classroom that I now identify as a key ingredient in teaching critical thinking: ironically my own *uncritical thinking* enhanced the teaching of *critical thinking*.

Students often exhibit resistance and hostility in the classroom when asked to think critically about religion. Analyzing their own religious worldviews and those of others from a scholarly perspective can produce emotional discomfort. As a new teacher I had to find a way to give students a structure to enable us all to pass through these emotions. The Zen emphasis on *not-knowing* and *not-attaining* provided the structure I needed. In Zen, *not-knowing mind* lets go of ideas and concepts in order to allow one to experience the present moment directly.

Continued on page 4

Services and Programs

Teaching Support
- Confidential Classroom Visits
- Open Classrooms

Research Support: Grants
- Internal University Grants
- Faculty Student Research Assistant Program

Groups and Teams
- Mentoring groups or partnerships
- Faculty Study Group Grants

Resources
- Website: www.scu.edu/facultydevelopment
- Small resource library of books, videotapes, and articles

Programs
- Pedagogy in Perspective brown bag discussions
- Teaching Scholar Symposia
- Research Colloquia
- New Faculty Orientation, Workshops, and Retreat

Training versus Education? The Challenge of Teaching First Year Students

Peter Ross, Senior Lecturer, Mathematics and Computer Science

In recent years mathematics and science educators at the national level have become increasingly concerned with pedagogical questions. They are asking *What is the best balance between rote-learning and problem solving in higher education?* Some put it more strongly: *Should students be spoon-fed or challenged?* Important data from the recent Third International Mathematics and Science Study (TIMSS) video study, reported in the February 2004 newsletter of the Mathematical Association of America, *FOCUS*, showed that "teachers in the United States, unlike every other country, always convert problem-solving opportunities into procedural tasks and teach their students to do them that way. Somehow, in our college and university courses perhaps, these teachers have learned that mathematics is all about recalling, and performing procedures to the exclusion of thinking, conjecturing and problem solving." The TIMSS project also documents how poorly American students perform when compared with students in the other 41 countries that participated on common test questions involving reasoning and problem-solving skills (http://4brevard.com/choice/international-test-scores.htm).

At SCU first year students come into our mathematics and science courses with expectations that the courses will focus primarily on memorization and lower-order procedural skills, and that practice tests and review sessions will be used as drills for tests that are similar to the practice tests. In my own courses students have requested on our departmental narrative evaluations that I "teach to the tests," give "better examples of what will be on quizzes (specific problems) and test on the same basic problems," and "don't teach material that is not on the quizzes."

This situation is compounded by a consumer mentality, a focus on student satisfaction, and a simplistic evaluation system. The consumer mentality and heavy emphasis on student satisfaction prevent faculty from challenging their students, thereby obstructing students' intellectual growth and problem-solving skills. And in the evaluation of teaching, busy chairs and administrators focus primarily on easily quantified data like numerical course evaluation forms rather than asking what students have actually learned.

Faculty would do well to seek a better balance of higher-order cognitive skills and critical thinking with the lower-order procedural skills and regurgitation of information, especially in technical fields like math, engineering and the natural sciences, and especially with first year students.

Continued on page 4

Chaos Theory, Metamathematics, and the Limits of Knowledge: Developing a New Course in Science and Religion

Alex Zecevic, Professor, Electrical Engineering

Over the past ten years my understanding of the role of a university professor has changed considerably. I continue to believe, of course, that we should teach our students to think critically, and that we must ensure their competence in specific areas of knowledge. But if we fail to give them at least a hint of what it is that we are passionate about as individuals and as scholars, we have missed something very important. More often than not, it is precisely this interactive element that makes the university experience special for our students. The rest they can get from books.

This kind of reasoning prompted me to develop a new course for engineering students combining my main intellectual interests. I called it "Chaos Theory, Metamathematics and the Limits of Knowledge: A Scientific Perspective on Religion." I taught the course for the first time in the spring of 2006. The course currently counts as a technical elective for engineering students and it satisfies the third Core Curriculum requirement in religious studies. One challenge I faced in developing the course was how to present some very difficult mathematical concepts in a way that undergraduate students could understand. Chaos theory, for example, is usually treated as a specialized topic for advanced graduate students, and teaching it to engineering seniors is very much like navigating through a mathematical minefield.

Continued on page 3

Schedule of Events

Winter and Spring 2007

All Events are 12:00 - 1:00

Tuesday, January 16 Wiegand Room Pedagogy for the First Year Student
Wednesday, January 17 Kennedy Commons Flexibility in the Faculty Life Cycle: An Open Discussion
Monday, January 29 Wiegand Room Applying for Promotion to Full Professor
Monday, February 5 Kennedy Commons Promoting Academic Integrity: Designing Assignments to Prevent Plagiarism (and What to do When Students Cheat)
Wednesday, February 21 Wiegand Room How I Write: Strategies of Successful Scholars
Tuesday, April 10 Wiegand Room Educating for Empathy
Monday, April 23 Wiegand Room Finding a Middle Ground Between Overteaching and Underteaching
Wednesday, May 16 Wiegand Room Supporting Research in the Academy: What are the Models that Work?

Chaos Theory, continued

It is a risky enterprise, it requires a good map. The map, in this case, was a textbook I wrote specifically for the course.

A larger challenge, however, was how to approach key theological questions. When I first started reading this literature, I found myself longing for a set of formal tools that would clarify some of the more difficult concepts. In the past I had relied on mathematics to help me accept esoteric ideas (such as curved space-time, or particle-wave duality), but there was no such "safe haven" when it came to religion. Without analytical models I turned to analogies with mathematics and science. This shift seemed to work: it turned into a useful technique for "translating" religious teachings into a language of analogies that was natural to me and my students.

Student response to the course took me by surprise. I knew many of the students from earlier engineering courses, and therefore had a pretty good idea of how much math they knew. What I did not know, however, was how they perceived religion and what was important to them personally. My experience with scientists and engineers suggested that I should be prepared to face a somewhat skeptical audience whose primary interests were of a technical nature. What I found instead was a group of young people who were remarkably open-minded, curious, and genuinely concerned with questions of meaning. Grading their final essays was actually a pleasant and uplifting experience. And that, I think, says it all! ■

Getting Students Beyond Google, continued

6. You are likely to find abstracts of articles. Abstracts are summaries of articles, usually one paragraph long. Be prepared to read lots of abstracts. You can often obtain the complete article or "full text" through the database. (Click the "full text" icon.)

7. If a complete article is not available in the database, you can search the online journals list to find out if we have it in print (request it from the ARS) or full text in a different database. If SCU does not have the journal it can be ordered for you through the interlibrary loan system. Many print journals are now available through online journal archives to which SCU subscribes such as JSTOR.

8. When you are using a database, do not use browser navigation keys at the top of the screen like "Back" or "File-Print." These keys may cause the database to malfunction. Instead, use the database's own function keys and buttons.

9. Punctuation can be risky in a database. Although some databases require quotation marks around words in a phrase, most punctuation should be avoided. It may have a special meaning in the code of the database.

10. If you have unsuccessfully tried several searches for your topic in one database, you may need to try a different database. Go back to www.scu.edu/library/ and start a new search. Don't hesitate to ask a librarian for help.

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Librarians will come to classes, speak with students in the library, and consult with faculty. They will give advice on which databases are most useful for your field. They know how to combine keywords with Boolean logic and how to narrow and reformulate search strategies. They will look over a syllabus and give recommendations on directing students to appropriate library resources. They can be contacted by email. Find your department's Library Subject Specialist at www.scu.edu/library/info/contact/liaison Librarians are eager to collaborate with faculty in supporting student learning. ■

Undergraduate Research at SCU: An Experiment in Integrating Faculty Research and Student Learning

With funding from the Doelger Charitable Trust Santa Clara University initiated a "Faculty Student Research Assistant Program" (FSRAP) three years ago. This year, thanks to an additional gift from the Doelger Trustees, the program has been expanded.

This innovative program integrates faculty research and student learning through undergraduate research opportunities. The brainchild of the University Research Committee, the program pairs undergraduate students in the federally funded Work-Study program with SCU faculty. Faculty serve as mentors, students serve as research assistants. Some projects involve interdisciplinary teams of faculty. Several faculty-student teams from earlier years are now publishing co-authored articles; others are presenting at national conferences.

Sample FSRAP research projects:

Chris Bachen and Chad Raphael, Gender and the Design of New Civic Media for Youth

Rich Barber and Brian McNellis, Polymer-based Photovoltaic Devices

Elsa Chen, Race, Ethnicity, and California's Criminal Justice System

Janice Edgerly-Rooks, The Evolution of Web-spinners

Bob Senkewicz and Rosemarie Beebe, The Writings of Father Junipero Serra

We invite new FSRAP proposals for the 2006-07 academic year by January 12; proposals for the 2007-08 academic year will be solicited in April. And we thank the Doelger Charitable Trust for its support of integrated education at SCU. See www.scu.edu/provost/facultydevelopment/universitygrants.cfm for more information. ■

Zen, continued

Practically speaking, *not-knowing mind* allows me to let go of the idea that anyone, including me, holds all the answers. Such a mind-set is very useful for teaching critical thinking. It allows me to present concepts and categories as tools for analysis that must constantly be challenged and critiqued but can never be threatened or threatening because they are only a partial view: they do not fully capture reality. Students find this perspective alien at first, but typically they begin to see that critical analysis is not a personal threat but rather a tool for deeper inquiry.

In Zen, *not-attaining mind* is about effort for its own sake that continually lets go of the outcome. Although I understand and appreciate my department's focus on "student learning outcomes," I also find it useful to let go of my concern for achieving the outcome. As a new teacher, this mind-set was imperative: when I fixated on my concern for success in the classroom to the exclusion of everything else, I could not maintain a tolerant, uncritical awareness. *Not-attaining mind* helped me be fully in the moment with my students. I think my pedagogy also helped the students experience and learn, letting go of the grasping mind that wants the grade rather than the critical understanding.

Zen practice in the classroom can enhance critical thinking, deepen learning, ease discipline problems, and take the charge out of grading conflicts. My students are more relaxed and less fearful, as am I. With an uncritical mind, with breath and body awareness, and with attention to *not-knowing* and *not-attaining* I can simply witness my students' transformation into critical thinkers (or not) rather than struggling to force them to change. Teaching has become a spiritual practice. ■

Training vs. Education, continued

What to do? Like most serious questions in education there are no simple answers. But I've found it helpful to remind my first year students of the following:

* University courses are not (or at least should not be) high school courses or even continuations of them: the expectations and goals in good universities like SCU are significantly higher than those for high schools.

* Tests and assignments should have a modest component that challenges even the best students, to let the A students show that they really are A students.

* Students are not expected to get 100% on assignments. A mastery-learning model is simply not appropriate for higher mathematics and many other disciplines.

* An important goal of education is the ability to transfer learning from one type of setting or problem to another. Asking students to transfer knowledge to new contexts will promote reasoning and problem solving.

* Another useful technique for weaning first year students from the overly modular approach they've likely had in high school and also the reliance there on weekly quizzes, is to test them slightly more frequently than by using just one or two midterms a quarter. I use three 45 minute "midterm quizzes."

What not to do? This question is easier, in my opinion. We should not water down our courses into high school level courses, even if by doing so it makes new students feel more comfortable. Some years ago an astute mathematician from New Zealand taught here for a year. Near the end of his visit he observed that our students were conditioning him into becoming a high school teacher! Faculty need to be aware of such subtle pressures, accommodating them when appropriate, but never at the expense of the loftier goals of higher education. ■

Open Classrooms

Six SCU Faculty serve as Open Classroom Professors:

- Jerry Burger, Psychology
- Phil Kesten, Physics
- Eileen Elrod, English
- Silvia Figueira, Engineering
- Brad Joondeph, Law
- Andy Tsay, OMIS

All faculty are invited to visit the classrooms of these professors at any time (with advance notice please).