

Essay for the 2006 Excellence in Teaching Award
David L. Wilson, Department of Biology, University of Miami

Teaching Passion

I intend both interpretations of the above phrase--I am very passionate about teaching but also try to develop a passion in my students about the subjects that I teach.

Biology 150

Stimulating passion is especially important in my fall-semester, introductory-biology class, which is filled mostly with premedical students. They need a sense of the importance of the material, both for their future and to help stimulate the major effort required to do well in the course. My end-of-semester reviews are filled with praise for me from most and complaints about the amount of material and its difficulty from many. I have struggled to make as many students successful as possible. Beyond my personal enthusiasm for the material, I read them poems about science, play songs about science, and come to class dressed as Dracula to tell them about blood. My style, and “nerdy humor” keep them listening and learning.

Each year, I have a number of students come to see me in tears, or near-tears. Each has had a career in medicine as a life-long goal, and my course is their first real stumbling block. These are stressful and emotional meetings for the students and for me. While some just may not have the necessary talent for success, others are talented but have inadequate backgrounds in high-school science, or were not well advised about courses to take. Some are very bright, bright enough not to have developed good study skills. And, always, a few have trouble coping with their new level of freedom from parental control.

Through the years, I have tried a number of ways to increase my students' chances of success. I developed a course, Foundations of Biology, and pulled weak students from the intro course after they failed to do well on the first exam, allowing them a fresh start in a new course that provides them an opportunity to build a foundation of math, physics, and chemistry for the life sciences.

Mike Gaines, Charly Mallery, and I developed peer-led, team-learning workshops for the students. During the semester, I meet once a week to review problem sets with a group of 30 to 40 juniors and seniors. They are workshop leaders, each leading groups of about 6 students enrolled in Biology 150 through the problems. I also have presented my experiences and ideas about peer-led team learning at two national conferences. I have learned that the workshops especially benefit weaker students in Biology 150, who learn more, and the workshop leaders who gain valuable experience and a good review of material before undertaking the Medical College Admissions Test.

I have written a book of lecture notes and problems for the Biology 150 course that was published by Blackwell Science. It is used by students around the globe, especially as there now is a Chinese translation of the book.

Although my Biology 150 class usually has in excess of 200 students, I have always given a combination of multiple-choice and short answer/problem solving/short essay exams. After ten years of asking, I was finally assigned a T.A. to help with the grading. I think it is important that our students do more than just bubble-in answers. In my upper-division courses, taught in the spring semesters, typically to 40 or more

students, I emphasize communication skills as well as knowledge development by requiring essays and class presentations from each student. We owe our students the best possible education, and that includes development of a variety of skills as well as new insights and knowledge.

Learning Communities

I have always loved interdisciplinary efforts because they force one to think about how areas of knowledge interact. That is why I remain enthusiastic about learning communities, even as they decline in number at our University. Every fall Lynn Durel and I teach a learning community that links some of the students in my Biology 150 class to her Psychology 110 class. We have about thirty students who meet with us one afternoon each week to talk about almost anything. It is a chance to make learning more intimate for science majors and premeds who seldom see a tenured or tenure-track professor in a class with fewer than 100 students before their senior year.

Another of my learning communities involved Steve Sapp in a combined course on the cultural and biological aspects of aging. Perhaps my favorite learning community effort is one on science and humanities, taught three times so far with Zack Bowen. We combine seniors who are majoring in English with those who are majoring in the biological sciences and attempt to bridge the two cultures. I provide more details on this effort in the second part of the essay.

Administrative Efforts

My love of teaching is reflected as well in some of my administrative efforts specifically related to teaching. In recent years, these include the following: from 1999-2004 I was associate provost for instructional advancement, working to improve undergraduate teaching at the University with faculty awards, meetings, lectures, and encouragement. From 2001-03 I served as the founding director (2001-03) of the new neuroscience major, a success story with more than 150 majors enrolled. I also chaired a recent attempt to improve our general education requirements, but this effort was not as successful as I would have liked. I still think we do need to do a better job of general education, and risk losing our better students if we do not develop something like the first-year seminars and capstone experiences recommended by the general education committee.

Evidence of a Lasting Passion

This semester I volunteered to teach an additional course—and a new prep for me—introducing biology majors to scientific research. I know that it is unusual for a faculty member to take on more teaching when it is not required, but the Department of Biology needs all-hands-on-deck right now—we have over 800 majors and fewer than 20 tenured or tenure-track faculty. I was pleased to be able to fill a gap and give our students at least one more course.

Of course, efforts do not end with the classroom. I tell my students that, during my office hours, I am like the Maytag repairman--I get lonely if they don't show up. Some take me up on the offer, and I get to know a number of them, even in the large lecture class. I also join with Lynn Durel in weekly meetings with the student group Solutions, which organizes intellectual activities on campus, and the two of us have lively

lunch discussions with 6-20 undergraduate students weekly during each semester. In a typical semester, I also give talks to one or two student groups, from Stanford scholars to minority pre-health student groups.

I estimate that I have taught about 7,000 students in my 34 years at the University. Last year (2005) alone, I wrote recommendation letters, sometimes more than one, for 48 students.

Where does the passion come from, and how does one make it last during a long career? I love learning. I want to know of the world and our place in it, and I love sharing what I know. I have changed research interests a number of times during my career and that has kept me constantly learning. It also prepares me to draw on a broader base of subjects and knowledge as I teach. I am constantly experiencing what my students do—learning and struggling with new ideas. As a graduate student I spent my days doing molecular biology in a laboratory and my evenings reading philosophy of mind. I have not slowed since. I have worked on bacteria, viruses, rats, sea slugs, nematodes, frogs, and garfish. I have studied molecular biology, cell biology, neuroscience, aging, and biology of consciousness. I usually have two or three research projects, on vastly different subjects, going at any time. I pepper my lectures with items from the news, recent movies, and medically relevant tidbits. While my lectures appear “unrehearsed yet thorough,” I can assure you that they are so well rehearsed that I can make them appear spontaneous. It’s part acting and mostly hard work in preparation—a lifetime of preparation that contributes to teaching being fun.

I want to thank the six students who independently took the time to nominate me. The brief quotes above came from those nominations. It is especially gratifying when students take time from their busy schedules to let one know that they do care. Teaching award or no, I love my job. Below I present a teaching practice which I have been developing and polishing for a few years.

Teaching Practice

With a couple of colleagues, I’ve been refining cross-disciplinary team teaching at the University of Miami. Cross-disciplinary team teaching is a variant on team teaching that is enriching for faculty and students. It has little in the way of costs, while offering considerable benefits for both faculty and students. Of course, team teaching is nothing new, but normal team teaching can work against students—they see a parade of faculty who give a few lectures and then are heard no more. While this may be appropriate for some specialized courses, and I participated in such teaching regularly at the School of Medicine, what I will describe is quite different.

Cross-disciplinary team teaching consists of two (or more) faculty members from different departments agreeing to teach a course together. Each has a course, typically upper division, listed in the home department (sometimes using experimental course numbers, sometimes an already listed course), so that all enrolling students gain credit within their major for the course. Although each course is listed separately in its department, the courses meet at the same time and place. Both faculty members are present for each class meeting, and share the teaching, often offering point-counterpoint lectures and responses, sometimes with students joining in for broader discussions. While I cannot claim to be the first to use this form of team teaching, I have participated in its development and promotion at the University of Miami.

After some experience with more traditional learning communities, teaming up with Lynn Durel to link introductory biology and psychology (an annual effort that is ongoing), my first attempt with cross-disciplinary team teaching was in a 1997 course with Steve Sapp from Religious Studies. We combined the cultural and biological sides of aging in a class that merged Masters of Arts in Liberal Studies students with juniors and seniors majoring in Religious Studies. Dr. Sapp introduced religious and social issues related to aging, while I presented why and how humans age, from demography to molecular biology. The combination of older MALS students and younger undergraduates gave us the extra advantage of a range of aging perspectives within our joint class of students.

With Zack Bowen, I perfected the approach in 1998, 2002, and 2004 with three offerings of a course on science and literature. We explored the interface between science and humanities as we attempted to bridge C.P. Snow's two cultures. Not only were we both present for each class, but each of us graded all of the papers and exams for all the students (typically, a combined enrollment of about 40 students).

The cross-disciplinary team-teaching approach affords students the opportunity to develop interdisciplinary understanding and allows inter-departmental communication barriers to be broken. Within the present university structure, students tend to learn discipline-specific information, and often fail to learn how to think across disciplines and take into account the implications that observations in one discipline have for others. Cross-disciplinary team teaching offers the opportunity for interdisciplinary interactions and skills development among our students.

Another advantage of cross-disciplinary team teaching for students is the combined expertise of two faculty members and the stimulating interactions between them and among students. Students gain insights into the limitations of knowledge as they develop arguments and critical thinking skills. The combining of students from two departments, especially in "majors' courses" at a senior level, allows them to gain new perspectives that would not have been easily available in single-major classes.

As concrete examples of the success of the cross-disciplinary team teaching, student reviews from our Spring 2004 offering of Science and Literature included the following comments: "Great class. If this class isn't offered at least once a year, you will be depriving students of an amazing class and experience." "Course was excellent. It really changed the way I look at things." "I think this is a wonderful apex to my college education. I thoroughly enjoyed the merging of the two fields and took away a wealth of knowledge from the course." "This is the first class that has forced me to actually think and has enabled me to be creative."

For faculty there is the advantage of an ongoing interaction with a colleague. We learn from each other's teaching styles and skills. This kind of team teaching breaks barriers normally present because of our departmental organization and promotes interactions that can lead to further collaborative efforts in teaching and research. Zack Bowen and I co-authored a book, *Science and Literature: Bridging the Two Cultures* (University Press of Florida, 2001), which grew directly from our experiences in the Science and Literature course. The book includes details about how we developed and taught the course, in effect announcing the process to a national audience. We also made presentations at two national conferences (American Association of Colleges and Universities and Sigma Xi) concerning our experiences, which resulted in some inquiries

by others interested in the approach. We also used the book as one of the texts for the 2002 and 2004 offerings of the course.

There are costs and savings with this kind of team teaching. The most major cost is in the additional time needed for designing and planning the course. For the Science and Literature class, Zack Bowen and I met for weekly lunches during the semester preceding the first offering of the class to map out the content and select the readings. Devoting the extra time was critical to having a well-organized course. There also are some time savings, since one is directly responsible for only about half of the classroom time, in terms of lectures or discussion leading. I have found it pretty much a break-even proposition. I think I work about as hard, when all is taken into account, in this kind of team-teaching class as I do in a class I am teaching alone. I know of no monetary costs, and classroom space actually is more efficiently used since what would have been two classes are merged into one classroom, often coming close to filling the room, but without changing the student/teacher ratio.

One possible obstacle that has not arisen in the four times I have taught such courses concerns the credit given to each faculty member for the teaching of this kind of a team-taught course. There was no problem convincing our chairs that each of us deserved credit for teaching a full course, even with the team teaching. While we might have had only half of the class-presentation time, we had more in the way of preparation and grading, and we each were present for, and participated in, all of the classes. Even the bean counters will realize that, since we merely combined the students who had enrolled in two separate courses in two departments, there was no loss of teaching coverage compared to each of us teaching a course to our majors alone.

I have found the experience of cross-disciplinary team teaching to be stimulating and enriching for all. It could be used as an aid in the development of teaching skills by younger faculty who collaborate with more senior faculty, and it could encourage senior faculty to expand and update their knowledge in new areas. I do not claim any deep originality with this teaching method, but have tried to perfect it and to think about how to spread its use.

A university education should be about gaining new knowledge, stimulating interchanges, and the development of new perspectives. Cross-disciplinary team teaching offers a cost-effective way of aiding in the achievement of these goals. With minimal encouragement from the administration, much more in the way of collaborative interchanges could occur on this campus using this approach, which could enrich both teaching and research. I'd like to start by bringing together faculty members who have previously been involved in learning communities and encouraging them to identify and contact faculty from other departments with whom they might create cross-disciplinary courses. Such an effort might be part of my teaching-award-related workshop or seminar, sharing the practice with other faculty members.

Already there are some other examples of more recent courses at the University that reflect some aspects, but not all, of the model described above. With Don Spivey, Zack Bowen has developed a variant of the model with their 60's class, which has been offered twice, and I am pleased to have participated as a minor player in both of these offerings. I also was a member of the committee that organized the Graying of America course, a interdisciplinary effort offered in 2003, which again reflected some aspects, but not all, of the model described above. Such offerings are suggestive of the range of

possibilities available for collaborative teaching that reaches beyond the normal boundaries of departments and schools.