

# Jim Davies: Teaching Statement

## Teaching Statement

To be a teacher and researcher in a university setting means being a mentor in and out of the classroom. For classroom students, my goals are to not only teach what they need to learn, but to inspire them about education and learning in general. For graduate students, my goal is to be a role model and mentor, showing the graduate students how a life of science is done, and how rewarding it can be. I think many people, not only scientists, were inspired to go into their fields because of an influential teacher. I have good reason for hope to be an inspiring teacher.

Pedagogically, I value engendering encouraging enthusiasm for the field, improving students' skill in communication, critical thinking, and problem-solving.

In graduate school I had three years of experience with research addressing the educational process. Both groups I was with worked on problem-based learning. The philosophy of PBL is that by giving students open-ended projects, they learn how to work in groups, how to deal with difficult problems, and are more motivated to learn the subject matter. I am currently working with a research group that studies learning in biomedical engineering laboratories. Thanks in part to my anthropological work in these labs, our group has discovered some contributing reasons for the lab's success: new lab members are immediately put to work on unsolved yet manageable problems. I believe that PBL is an excellent framework for teaching graduate classes because scientific research is also inherently problem-based. Even if the student project "fails" in terms of finding a solution to the problem, students learn about the subject matter as well as how to find the needed knowledge.

Undergraduate classes are more structured and knowledge-oriented. Undergraduates are not being specifically trained for research careers. However, PBL has been shown to be effective even for middle-school students. My undergraduate classes will be a mixture of lecture, discussion, and student topic and project presentations.

Realistically, teachers cannot give the same amount of attention to individual projects in large undergraduate classes. But a problem-based approach can be taken even with large groups in the forms of occasional discussions about how certain problems are best solved. I also have a plan to build a collaborative web-based Artificial Intelligence textbook. In conjunction with student class presentations, students will be assigned to contribute entries regarding specific AI topics. Entries can include text, algorithmic demonstrations, quizzes, code, corrections to previous entries, presentations, and of course paper summaries. Successive classes can continue to add to it.

I have led several three-hour discussions for classes where the instructor was not present, and received positive feedback for this work. Also I was a teaching assistant for a computer ethics class that was entirely discussion-based— I attended every class and helped facilitate. I believe it is important to get the students talking, finding for themselves as much as possible the mistakes and misconceptions, as well as the good ideas. Since a great deal of knowledge taught in classes is forgotten, it is more important to reinforce general critical thinking, creativity, and communication in classroom situations.