



# The Missing Link?



*A course design study on the possible disconnect between the scientific community and the general public on the socially, controversial issue of evolution.*

Jevin West, Kathy Hall

Department of Biology, University of Washington, Spring 2007

## Abstract

Despite the nearly unanimous acceptance within the scientific community, evolution is one of the most widely misunderstood concepts among the general public. The social controversy associated with the teaching of this subject suggests that there may be a failure in an aspect of basic science education. The group of individuals that will have the greatest impact on improving upon this problem are high school biology teachers. Therefore, we propose a course geared towards high school biology teachers that will provide the resources to better communicate what evolutionary biology is, how it is conducted and what it provides for society. Using various assessment tools, we will collect data from the teachers that will be used to help identify and understand the reasons behind the disconnect between the general public and the scientific community. We will also use the data to construct better methods for teaching this concept and others like it.

The first part of the study will include a two-day class that will be used to collect preliminary data on what pedagogies are most effective. The class will include all the soon-to-be teachers in the Masters of Science in Biology for Teachers Program here at the University of Washington. The second part of the study will incorporate what is learned from these two classes to create a quarter-long course on this subject geared for current and soon-to-be high school biology teachers. This poster focuses on the first part of the study.

## Class Format

### Pre-class survey

This survey will be conducted before the class starts. Questions will address issues like apprehensions in teaching evolution, previous class time on this subject and general feelings about the issue. This will give the teachers an opportunity to reflect on the issue. The data will be used for assessment following the completion of the class.

### Post-class survey

This survey will be conducted following the completion of the two classes. Questions will be similar to the questions asked in the pre-class survey to see if there were changes in the answers after completing the classes. The data will be used to construct the class next year.

### The Three Questions

The classes will center around three questions: What is Evolution? Why bother teaching it? Why is it uniquely controversial? By addressing these questions through individual responses, small-group discussion and class discussion, the teachers will have a chance to refine and clarify their thinking on this topic.



### Scientific Community (Evolution)

### Academia

Socio-political  
Ideological  
Cultural

What is science?

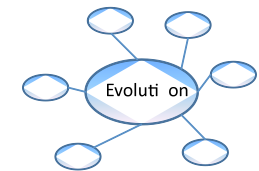
### HS Teachers

### HS Students

## Questions

### What is evolution?

We will ask each teacher to identify the six most important aspects of evolution. This will lead us into the discussion of what evolution is and how evolution should be taught. This will be done individually and at the group level. We will compare the teachers responses to this question to evolutionary biology professor responses. This comparison will be our first look at possible disconnects in basic evolutionary understanding.



### Why bother teaching Evolution?



Agriculture and pesticide resistance



Drug development and medicine



Global warming and conservation

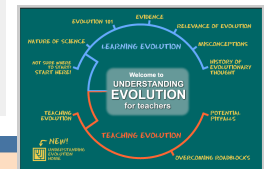
Why do we have to learn evolution?



After small-group discussions, the class will construct a concrete response to this question. We think that part of the answer to this question involves practical applications of evolution. We will use this question to expand on this idea of teaching evolution as an applied science.

### Why is evolution uniquely controversial?

For this question, we will provide the teachers with resources to explore this issue. For example, we will use the vast resources available at Berkeley's Understanding Evolution website. The teachers will then write a paper on why this science topic gets so much attention by the general public. The class, as a group, will then design lesson plans to deal with this controversy. These lesson plans and responses will be used in further studies of this issue.



## Future directions

We will use what we learn from this two-day class to design a quarter-long class that deals with the issue of evolution for high school biology teachers in more depth. We will look at effective lesson plans for specific subject areas. We will address questions like the following:

- Are teleological and anthropomorphic explanations appropriate for high school biology?
- How valuable is the lab experience for evolutionary biology?
- Is constructivism and engagement of a student's preconceptions an effective way to teach evolution?
- Is teaching evolution as an applied science an effective way of introducing this area of biology?

The scientific community continues to have difficulty communicating to the general public what scientists do. The social controversy surrounding evolution provides a platform by which the deeper issues can be addressed like what science is and the methodologies behind it. Once these issues are clearly communicated, questions like whether evolution should be taught in high schools will have a much clearer answer.

## Thanks

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