Discussion Practicum

GOALS

1. To practice being in charge of the learning experience of a group of students. Just the experience of standing before the mock class with responsibility for leading the discussion is half of the value of the exercise.

2. To practice some of the repertoire of strategies to use in planning, starting, and leading a discussion developed in the "Leading Discussions" session. The scientific content is not important in this exercise; the process of discussion leading is important.

KEY CONCEPTS

• A discussion is distinctly different from a lecture. The students should do more talking than the discussion leader, who should just direct and catalyze the students’ comments.

• The discussion leader should have a clear idea of what subject matter content he/she wants to students to come away with at the end of the discussion. The students should leave the discussion knowing what material from the discussion they are responsible for.

• The discussion leader should have a clear idea of what discussion techniques he/she will use to convey the desired subject matter content and why.

• There is no substitute for practice when learning to lead discussions.

PROCEDURE

1. You will be assigned to groups of four. Each participant will take one turn as the discussion leader and three turns as a mock student.

2. Plan your time carefully--discussions usually proceed more slowly than you think they will. Lead a discussion on your topic for 15 minutes, keeping track of time (the facilitator may need to step in otherwise).

3. The final 15 minutes are to be spent analyzing the discussion. First report what you thought worked well in the discussion and what you might have done differently. Then your "class" and the facilitator will state what they thought worked well in the discussion and what they thought you might have done differently.

STRATEGY

1. Your discussion group will consider the discussion topic below. This "open-ended" question is intended to explore multiple points of view and opinions, and the evidence supporting them, such as might be assessed using essay questions or a term paper.

2. The topic is broken down into four sub-topics (listed below). The day before the practicum, you will choose one of the sub-topics for the portion of the discussion you will lead. A couple of short articles are provided to provoke discussion. Read these overnight and use them to help get your portion of the discussion started.

3. At the start of this session, assemble into the previously selected groups, each in a separate room, with one or more facilitators. Proceed in the designated order of sub-topics, each of which has a set of questions. These are provided to help guide your discussion of the sub-
topic. You should make an effort to coax the mock class members to respond to all of these questions, but you can be flexible about accommodating other responses as well.

4. Reminder: You are not presenting a lecture or research seminar at which you answer questions. The goal of your session is to guide the "class" to do the talking and fully elaborate the important issues and viewpoints.

**DISCUSSION TOPIC: How to teach the origin of the Earth & life in public schools?**

1. Introductory questions
   - What is the “creationist” viewpoint?
   - What is the “intelligent design” viewpoint?
   - What is the “Darwinist” viewpoint?

2. Exploratory questions
   - For each viewpoint, how well does it accommodate the others?
   - What are the points of agreement among the three viewpoints?
   - What are the points of disagreement among the three viewpoints?

3. Analysis questions
   - What are the arguments that proponents use in favor of teaching creationism or intelligent design in public schools?
   - What are the arguments that opponents use against teaching creationism or intelligent design in the public schools?
   - What are the different approaches to “teaching” that could be used for handling the issues of origins in a public school classroom (science or other)?

4. Conclusion questions
   - Are there any other resources you would like to have to help you decide how to handle this issue in the public school classroom?
   - For each participant, what would you do in your science classroom and why? How would you defend your choice against the counter-arguments?
   - Suppose that you are the public school principal and need to get all teachers to agree on a single policy about teaching origins in the classroom. Forge a consensus on how the subject of origins should be taught in your school.

**Bush Remarks Roil Debate on Teaching of Evolution By ELISABETH BUMILLER**

*Nytimes.com August 3, 2005 Correction Appended*

WASHINGTON, Aug. 2 - A sharp debate between scientists and religious conservatives escalated Tuesday over comments by President Bush that the theory of intelligent design should be taught with evolution in the nation's public schools.

In an interview at the White House on Monday with a group of Texas newspaper reporters, Mr. Bush appeared to endorse the push by many of his conservative Christian supporters to give intelligent design equal treatment with the theory of evolution.

Recalling his days as Texas governor, Mr. Bush said in the interview, according to a transcript, "I felt like both sides ought to be properly taught." Asked again by a reporter whether he believed that both sides in the debate between evolution and intelligent design should be taught in the schools, Mr. Bush replied that he did, "so people can understand what the debate is about."

Mr. Bush was pressed as to whether he accepted the view that intelligent design was an alternative to evolution, but he did not directly answer. "I think that part of education is to expose people to different schools of thought," he said, adding that "you're asking me whether or not people ought to be exposed to different ideas, and the answer is
On Tuesday, the president's conservative Christian supporters and the leading institute advancing intelligent design embraced Mr. Bush's comments while scientists and advocates of the separation of church and state disparaged them. At the White House, where intelligent design has been discussed in a weekly Bible study group, Mr. Bush's science adviser, John H. Marburger 3rd, sought to play down the president's remarks as common sense and old news.

Mr. Marburger said in a telephone interview that "evolution is the cornerstone of modern biology" and "intelligent design is not a scientific concept." Mr. Marburger also said that Mr. Bush's remarks should be interpreted to mean that the president believes that intelligent design should be discussed as part of the "social context" in science classes.

Intelligent design, advanced by a group of academics and intellectuals and some biblical creationists, disputes the idea that natural selection - the force Charles Darwin suggested drove evolution - fully explains the complexity of life. Instead, intelligent design proponents say that life is so intricate that only a powerful guiding force, or intelligent designer, could have created it.

Intelligent design does not identify the designer, but critics say the theory is a thinly disguised argument for God and the divine creation of the universe. Invigorated by a recent push by conservatives, the theory has been gaining support in school districts in 20 states, with Kansas in the lead.

Mr. Marburger said it would be "over-interpreting" Mr. Bush's remarks to say that the president believed that intelligent design and evolution should be given equal treatment in schools.

But Mr. Bush's conservative supporters said the president had indicated exactly that in his remarks.

"It's what I've been pushing, it's what a lot of us have been pushing," said Richard Land, the president of the ethics and religious liberties commission of the Southern Baptist Convention. Dr. Land, who has close ties to the White House, said that evolution "is too often taught as fact," and that "if you're going to teach the Darwinian theory as evolution, teach it as theory. And then teach another theory that has the most support among scientists."

But critics saw Mr. Bush's comment that "both sides" should be taught as the most troubling aspect of his remarks.

"It sounds like you're being fair, but creationism is a sectarian religious viewpoint, and intelligent design is a sectarian religious viewpoint," said Susan Spath, a spokeswoman for the National Center for Science Education, a group that defends the teaching of evolution in public schools. "It's not fair to privilege one religious viewpoint by calling it the other side of evolution."

Ms. Spath added that intelligent design was viewed as more respectable and sophisticated than biblical creationism, but "if you look at their theological and scientific writings, you see that the movement is fundamentally anti-evolution."

The Rev. Barry W. Lynn, the executive director of Americans United for Separation of Church and State, called the president's comments irresponsible, and said that "when it comes to evolution, there is only one school of scientific thought, and that is evolution occurred and is still occurring." Mr. Lynn added that "when it comes to matters of religion and philosophy, they can be discussed objectively in public schools, but not in biology class."

The Discovery Institute in Seattle, a leader in developing intelligent design, applauded the president's words on Tuesday as a defense of scientists who have been ostracized for advancing the theory.

"We interpret this as the president using his bully pulpit to support freedom of inquiry and free speech about the issue of biological origins," said Stephen Meyer, the director of the institute's Center for Science and Culture. "It's extremely timely and welcome because so many scientists are experiencing recriminations for breaking with Darwinist orthodoxy."

At the White House, intelligent design was the subject of a weekly Bible study class several years ago when Charles W. Colson, the founder and chairman of Prison Fellowship Ministries, spoke to the group. Mr. Colson has also written a book, "The Good Life," in which a chapter on intelligent design features Michael Gerson, an evangelical Christian who is an assistant to the president for policy and strategic planning.

"It's part of the buzz of the city among Christians," Mr. Colson said in a telephone interview on Tuesday about intelligent design. "It wouldn't surprise me that it got to George Bush. He reads, he picks stuff up, he talks to people. And he's pretty serious about his own Christian beliefs."
In Explaining Life's Complexity, Darwinists and Doubters Clash By **KENNETH CHANG** (Excerpted by RS)

*New York Times August 22, 2005*

At the heart of the debate over intelligent design is this question: Can a scientific explanation of the history of life include the actions of an unseen higher being?

The proponents of intelligent design, a school of thought that some have argued should be taught alongside evolution in the nation's schools, say that the complexity and diversity of life go beyond what evolution can explain.

Biological marvels like the optical precision of an eye, the little spinning motors that propel bacteria and the cascade of proteins that cause blood to clot, they say, point to the hand of a higher being at work in the world.

In one often-cited argument, Michael J. Behe, a professor of biochemistry at Lehigh University and a leading design theorist, compares complex biological phenomena like blood clotting to a mousetrap: Take away any one piece - the spring, the baseboard, the metal piece that snags the mouse - and the mousetrap stops being able to catch mice.

Similarly, Dr. Behe argues, if any one of the more than 20 proteins involved in blood clotting is missing or deficient, as happens in hemophilia, for instance, clots will not form properly.

Such all-or-none systems, Dr. Behe and other design proponents say, could not have arisen through the incremental changes that evolution says allowed life to progress to the big brains and the sophisticated abilities of humans from primitive bacteria.

These complex systems are "always associated with design," Dr. Behe, the author of the 1996 book "Darwin's Black Box," said in an interview. "We find such systems in biology, and since we know of no other way that these things can be produced, Darwinian claims notwithstanding, then we are rational to conclude they were indeed designed."

It is an argument that appeals to many Americans of faith.

But mainstream scientists say that the claims of intelligent design run counter to a century of research supporting the explanatory and predictive power of Darwinian evolution, and that the design approach suffers from fundamental problems that place it outside the realm of science. For one thing, these scientists say, invoking a higher being as an explanation is unscientific.

"One of the rules of science is, no miracles allowed," said Douglas H. Erwin, a paleobiologist at the Smithsonian Institution. "That's a fundamental presumption of what we do."

That does not mean that scientists do not believe in God. Many do. But they see science as an effort to find out how the material world works, with nothing to say about why we are here or how we should live.

And in that quest, they say, there is no need to resort to otherworldly explanations. So much evidence has been provided by evolutionary studies that biologists are able to explain even the most complex natural phenomena and to fill in whatever blanks remain with solid theories.

This is possible, in large part, because evolution leaves tracks like the fossil remains of early animals or the chemical footprints in DNA that have been revealed by genetic research.

For example, while Dr. Behe and other leading design proponents see the blood clotting system as a product of design, mainstream scientists see it as a result of a coherent sequence of evolutionary events.

Early vertebrates like jawless fish had a simple clotting system, scientists believe, involving a few proteins that made blood stick together, said Russell F. Doolittle, a professor of molecular biology at the University of California, San Diego.

Scientists hypothesize that at some point, a mistake during the copying of DNA resulted in the duplication of a gene, increasing the amount of protein produced by cells.

Most often, such a change would be useless. But in this case the extra protein helped blood clot, and animals with the extra protein were more likely to survive and reproduce. Over time, as higher-order species evolved, other proteins joined the clotting system. For instance, several proteins involved in the clotting of blood appear to have started as digestive enzymes.

By studying the evolutionary tree and the genetics and biochemistry of living organisms, Dr. Doolittle said, scientists have largely been able to determine the order in which different proteins became involved in helping blood clot, eventually producing the sophisticated clotting mechanisms of humans and other higher animals. The sequencing of animal genomes has provided evidence to support this view.
For example, scientists had predicted that more primitive animals such as fish would be missing certain blood-clotting proteins. In fact, the recent sequencing of the fish genome has shown just this.

"The evidence is rock solid," Dr. Doolittle said.

Intelligent design proponents have advanced their views in books for popular audiences and in a few scientific articles. Some have developed mathematical formulas intended to tell whether something was designed or formed by natural processes.

Mainstream scientists say that intelligent design represents a more sophisticated - and thus more seductive - attack on evolution. Unlike creationists, design proponents accept many of the conclusions of modern science. They agree with cosmologists that the age of the universe is 13.6 billion years, not fewer than 10,000 years, as a literal reading of the Bible would suggest. They accept that mutation and natural selection, the central mechanisms of evolution, have acted on the natural world in small ways, for example, leading to the decay of eyes in certain salamanders that live underground.

Some intelligent design advocates even accept common descent, the notion that all species came from a common ancestor, a central tenet of evolution.

Although a vast majority of scientists accept evolution, the Discovery Institute, a research group in Seattle that has emerged as a clearinghouse for the intelligent design movement, says that 404 scientists, including 70 biologists, have signed a petition saying they are skeptical of Darwinism.

Nonetheless, many scientists regard intelligent design as little more than creationism dressed up in pseudoscientific clothing. Despite its use of scientific language and the fact that some design advocates are scientists, they say, the design approach has so far offered only philosophical objections to evolution, not any positive evidence for the intervention of a designer.

….Intelligent design proponents are careful to say that they cannot identify the designer at work in the world, although most readily concede that God is the most likely possibility. And they offer varied opinions on when and how often a designer intervened.

Dr. Behe, for example, said he could imagine that, like an elaborate billiards shot, the design was set up when the Big Bang occurred 13.6 billion years ago. "It could have all been programmed into the universe as far as I'm concerned," he said.

But it was also possible, Dr. Behe added, that a designer acted continually throughout the history of life. Mainstream scientists say this fuzziness about when and how design supposedly occurred makes the claims impossible to disprove. It is unreasonable, they say, for design advocates to demand that every detail of evolution be filled in.

U.S. Constitution Bill of Rights Amendment I
Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievances.

www.law.cornell.edu/constitution/constitution.billofrights.html
DISCUSSION STRATEGIES (from “The Art of Discussion Leading”)

• Make personal contact. Treat your students as individuals. Help the students feel at ease in the classroom.
• Get there early and set the place up. Read every signal you can get.
• Proceed with a series of three types of questions: 1) A general overview; 2) Analyzing & explaining in greater depth; 3) Elaborating alternative explanations. (These move roughly up the scale of Bloom’s taxonomy of cognitive skills).
• Restate the students’ remarks in your own words to clarify their statements and stimulate more responses.
• Respectfully request the students to participate, rather than demanding (if possible).
• A strength of discussion over lecture is the ability to share multiple points of view.
• Thank the students for participating. Give positive reinforcement. Lower the anxiety level.
• Create a safe environment in which students can express themselves, even their "incorrect" ideas or lack of understanding.
• Be aware of the students as well as of the narrative. The discussion is as much process as content.
• There is great value in the ability to read your students using very brief signals and subtle cues.
• Students learn more by thinking for themselves and by verbalizing their thinking than by passive listening.
• Students learn from your conduct as well as from the course content.
• It’s about the students, not about you.

REFERENCES


“The Art of Discussion Leading” (Derek Bok Center for Teaching and Learning, Harvard, 1995) available on loan from UWCIDR.