

Fostering Deep Learning

People Learn Best and Most Deeply When:

- They try to answer questions or solve problems they find interesting, intriguing, important, or beautiful;
- They can try to answer the question or solve the problems then receive feedback and try again before anyone "grades" them on their efforts;
- They can work collaboratively with other learners struggling with the same problems;
- They have lots of opportunities to speculate about possible answers or solutions even before they know much about the subject, and to receive feedback on those speculations;
- They face repeated challenges to their existing fundamental paradigms;
- They can get support (emotional, physical, and intellectual) when they need it;
- They care that their existing paradigms do not work;
- They believe that they are in control of their own learning, not manipulated;
- They believe that their work will be considered fairly and honestly;
- They believe that their work will matter, that it will have significant consequences for themselves and/or their world;
- They believe that intelligence and abilities are expandable, that if they work hard, they will get better at it;
- They believe other people have faith in their ability to learn;
- They believe that they can learn;
- They have an opportunity to "do the discipline" before they fully "know the discipline; in other words, they have an opportunity to learn by doing;
- They have an opportunity to learn inductively moving from specific example and experience to general principles, rather than from the general to the specific.

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For additional ideas see Ken Bain, *What the Best College Teachers Do*. Harvard University Press, 2004.

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Promising Syllabus

The Promising Syllabus

Question: Can a change in the syllabus stimulate deeper and more enthusiastic student learning? What kind of syllabus do highly effective teachers use?

We studied teachers who have enormous success in helping and encouraging their students to achieve remarkable learning and found that they usually produce a certain kind of syllabus.

If the syllabus didn't exist and you wanted to invent one based on what we think we know about human motivation and learning, what kind of syllabus would you produce?

Answer: The same kind that highly successful teachers already use.

How so?

Human beings tend to be naturally curious animals, but that love of learning can actually decrease with extrinsic motivators that appear to manipulate the learner. In short, we all like to control our own learning.

The problem, of course, is that professors usually control the questions that are raised and the material to be learned, and rightly so. But that leaves students with little sense of influence over their own education. The typical syllabus accentuates this problem, emphasizing "requirements" and "assignments" that the professor has devised.

Not surprisingly, working under such a syllabus even many good students become strategic learners, learning to follow orders and do what is necessary to make the grade but avoiding deeper learning. We can

begin to reconstruct the environment in which our students learn with a syllabus that makes promises rather than demands, inviting students to a deliciously provocative intellectual or artistic feast.

Here's how:

Elements of A Promising Syllabus:

In addition to the standard information about the professor and TA's the syllabus a promises contains three elements.

I. The Promises:

Example:

In the 1970's and 80's, Former Senator William Proxmire awarded what he called the "Golden Fleece" Award, a sarcastic recognition of what he thought were projects that wasted public funds. Some of the recipients of this dubious honor were scientists whose studies appeared to the senator to be examinations of ridiculously small questions that had no value.

Was Senator Proxmire justified in his criticism? What do research scientists do? Why do they sometimes spend years studying extremely small questions? What kind of research takes place at this university? Is it worthwhile? Some projects funded with public dollars may be ridiculous, while other strange- sounding endeavors may actually have enormous value. How do you tell the difference?

In this course, you will have an opportunity to explore some of the exciting research being done on biological clocks. In the process, you will develop considerable insight into the

nature of science and the research lives of scientists. You may or may not become a research scientist, but you may some day have to decide about funding for a research endeavor. This course will help you make those decisions wisely. It will also help you understand more about how your own internal clock and the clocks that exist in every animal work. Why do college students often like to stay up late while their parents are "early to bed and early to rise" people? Why do people suffer from jet lag? How do we find out about how Biological Clocks work? How do scientists draw conclusions? How certain are those conclusions?

II. Ways to Fulfill Those Promises

(formerly known as requirements and assignments but carefully avoiding the language of "requirements" and "assignments"). The activities appear to flow naturally from fulfilling the promises.

Example:

To realize these promises you must take responsibility for your own learning and participate as an active learner. The best way to learn what scientists do is to spend some time with one. We have arranged for each student to spend at least eight hours with a research scientist. That person will tutor you in the ways of science, explaining their project to you and helping you understand the process of science. At the end of your experience in the tutoring program, you will write a five page paper about your experience. This paper will help you get more out of the experience and it will help us evaluate your learning, providing

The Promising Syllabus

you with more accurate feedback. During class lectures, we will provide you with more explicit information on how to write this paper. During class, we will also provide you with lectures on key concepts and information that will also help you learn.

Reading, Writing, and Thinking in the Course

To take charge of your own education, you must be willing to read. We will provide you with some reading material that you will read, analyze, and think about between each class. We will distribute this material to you electronically.

You will also pursue a topic of special interest to you and write a paper about that topic. The writing of the paper will help you refine your thinking and understanding. If you do not learn to communicate in words, you cannot formulate fully developed thoughts and will, instead, live by the vague impressions and emotions that often substitute for ideas.

By the end of the course, you should be able to {brief list or description of the major learning objectives}.

III. The beginning of a conversation about how the teacher and student will best come to understand the nature and progress of the students learning and thinking (formerly known as grading policy, but far more than that).

Example:

The final grade will assess each student's ability to draw and defend historical conclusions and to think historically. To evaluate your

progress in reaching these goals (and to provide you with feedback on your learning), we will look at the following items:

Example Two:

We want to help you think about and understand your own learning and thinking so that you can better take charge of that learning. In the course of the semester, By the end of the semester, you should be able to assess your own work and make an argument about where you are in your learning (remember, an argument is not just conclusions but evidence offered in support of conclusions). Here are some guidelines for the self-assessment that will help you make that argument.

Purpose: I understand that the purpose of this activity is to assess my own learning. If successful, the reader will grasp explicitly what I have and have not learned in the way of thinking abilities. I will display critical thinking about my thinking. I will begin by stating the grade which I believe that I have the evidence to support. I will build a case for my grade using the criteria below and excerpts from my own work as support. (Note: Ironically, a well-reasoned case for you to get a low grade may well justify you getting a higher grade, while a poorly-reasoned and weakly-supported case for getting a high grade will certainly guarantee a lower grade. The most impressive response will be an accurate assessment of your strengths and weaknesses leading to a well-substantiated conclusion).

Overall Course Goals and Objectives: The goal of the course is to develop thinking abilities and the knowledge and understanding that result from

their use in the study of questions and issues.

My areas of strength: I am best at the thinking abilities listed below. I will attach evidence from my work along with accompanying analysis and commentary.

My areas of weakness: I am weakest at the thinking abilities listed below. I will attach evidence from my work along with accompanying analysis and commentary.

If the course grade is to be based on how well I develop thinking abilities and the knowledge and understanding that result from their use in answering questions, my grade should be a _____.

Attached is a summary of the reasoning on which I base my judgment.

See Ken Bain. *What the Best College Teachers Do* (Harvard University Press, 2004) for more discussion of how to create a Natural Critical Learning Environment.

Edited by Ken Bain Emma Rossi, and Whitney Steen

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Transforming Lectures

Transforming Big Classes (and some small ones too)

Question: How can you help students learn more deeply in large lecture classes?

Transforming Lectures:

When we studied outstanding lecturers (people who could engage their students and help them learn deeply) as part of the Best Teachers Project, we noticed that their lectures nearly always contained five elements. We say "elements," because while those parts often came in the order we list below, they also came in different orders and sometimes even overlapped one another.

- **A question or problem.** People learn best and most deeply when they are trying to solve problems that they have come to regard as important, beautiful, and/or intriguing. They also love stories, so good lecturers often tell stories to raise a question or problem.
- **Help for students in adopting the question or problem as their own.** People learn best and most deeply when they are trying to solve problems that *they* have come to regard as important, beautiful, and/or intriguing. Good lecturers help students see the significance, beauty, and intrigue of the problem. Sometimes they do that with a good story, or by connecting the question or problem to some larger question or problem.
- **Engagement of the students in higher order thinking (applying, analyzing, synthesizing, evaluating) about the question or problem (using active learning).** People learn best by doing and getting feedback on their efforts; if you want them to learn to think critically, they must have opportunities to do so. Highly effective lectures engage students in thinking critically through the problem or questions; they don't just ask students to remember information or memorize procedures.
- **A tentative answer or solution.** When people learn deeply, they construct their own understanding of what something means, how it might be applied, what its implications are, and so forth. Outstanding lecturers help students construct, apply, analyze, synthesize, and evaluate meaning. They don't just try to

pour information in students' ears.

- **A new question or problem.** How do we understand the problem or question now? What's the next question? What problems arise once we solve this one?

While the lectures of outstanding teachers nearly always contained these five elements, many ineffective lectures contained only the fourth element, an answer to a question nobody had raised.

Ironically, some outstanding lecturers sometimes leave out the fourth element. They help students understand and buy into a question, engage them in higher order thinking about the question, and send them off to pursue the question, now understood in a whole new way (thus, a new question).

Delivering the Great Lecture

The five elements shape the great lecture, but effective delivery helps too. How can you deliver the lecture more effectively? Here are some hints we heard from highly effective lecturers:

- **Have good intentions.** When we asked highly effective lecturers what they intended when they lectured, they said they wanted to help students understand, provoke them to think differently, apply their understanding, analyze, synthesize, and evaluate. When we asked not so successful lecturers, they often said they wanted to cover the material. In contrast, great lecturers wanted to uncover the material. At best, less successful lecturers said they wanted to help students remember or "to pick out the key information" they were supposed to remember, but these teachers seldom if ever said they wanted to help students think. Let good intentions guide everything you do: the eye contact you make with students, the little pauses you use to let key points land, the questions you ask, the rhetorical questions you employ, the clear and provocative explanations you utilize, the posture you assume. Help students begin to build their understanding, but also provoke them to think critically and creatively, and give them some time and space to do so. [While students have the most difficulty with higher order thinking, traditional lecturers, at best, concentrate only on the lower order abilities: remembering and understanding].
- **Treat the lecture as a conversation,** even if you are doing most of the talking. People learn deeply by engaging in a conversation with themselves. Encourage that

conversation. Look into students' eyes. Read their reactions and change pace or explanations when appropriate. Engage students in thinking with you. Don't just "cover" the material. Engage them in two-way talk. Listen and respond to students.

- **Recognize that the lecture has some performance qualities.** Fill the room with your presence. Make sure everyone can hear you and see any illustrations. Don't hide behind the podium. Repeat key points. Change pace every ten minutes. Allow time for students to answer and think about the material presented. Entertain by provoking thought, showing a sense of humor, and displaying enthusiasm. Create an inner tension, a sense of anticipation or curiosity. Show your interest in the material and in the students. Show you are interested in what they learn. Try to end with an intellectual bang.

Stop Delivering the Lecture

Remember, however, the purpose of the lecture is not for you to perform, but for the students to learn. Stop frequently, pose problems, get students to work on them individually, in pairs, in small groups, and then to report back. Listen and respond. Let students respond to one another.

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