THE BEACON

THE QUARTERLY NEWSLETTER OF THE CENTER FOR TEACHING AND LEARNING

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In this issue

Upcoming Events

Faculty Development Luncheons hosted by the Center for Teaching and Learning. Guest presenters from the Fischler School of Education and Human Services.

January 20 - Shelley Victor and Soledad Arguelles *"Small Group Instruction"*
February 24 - Marcelo Castro and James Pann *"Assessment of Student Learning"*
March 24 - Shelley Victor and Soledad Arguelles *"Alternative Assessment"*
April 21 - Marcelo Castro and James Pann *"Grading"*

Stats Boot Camps hosted by the Statistical Consulting Group.

January 13 - Patrick Hardigan "*Measurement"*
February 11 - Wallace Marsh *"Reliability and Validity"*
March 9 - Manuel Carvajal *"Least Squares, Linear, and Multiple Regression"*
April 14 - Jay M. Fleisher *"Small Clinical Trials"*

RSVP to Kathleen Hagen at extension 1235 or khagen@nsu.nova.edu no later than 3 days before each session.

TWENTY WAYS TO MAKE LECTURES MORE PARTICIPATORY

Derek Bok Center for Teaching and Learning, Harvard University

Lectures play a vital role in teaching. There will always be a place for lectures in the curriculum; to give technical material or factual information, to provide structure to material or an argument, to display a method or example of how one thinks in a given field, or even to inspire and motivate students to explore further. At the same time, your presentation of the material and students' learning when students are able to participate in some way. When students engage actively with material, they generally understand it better and remember it longer.

Asking for student participation highlights the distinction between faculty covering material and students learning it. Student participation often results in covering less material during a semester. Yet it also can mean that students learn more material than in a traditional lecture course, because they truly grasp the fundamentals and have more chances to clear up confusion. Large numbers of students in class does not preclude interaction. The following list of ways to open up lectures to student participation have been used in classes of up to 1200 students, as well as in smaller groups.

Note: If you decide to invite student participation in lectures, consider beginning with the very first lecture, when norms and expectations for class are being established. It is more difficult to engage students in a large lecture class later if they are accustomed to being silent. If you decide to ask students to participate in lectures later in the term, give a short introduction or explanation about your change in strategy.

Twenty ways to make lectures more participatory

Beginning the lecture (or course)

1. Begin the course or the lecture with a question or questions which help you to understand what students are thinking. "What are some of the differences between clinical medicine and public health?" "How do we interpret medical research findings? For example, the response rate for one regimen is 23% and another treatment showed a 40% response rate. How can we interpret these numbers? What other information would we want to know?" "What would be a feminist perspective on contraceptive research?" "What are some examples of marginalized populations?" "What image do you have of people who have HIV or AIDS?"

2. Begin the course or the lecture by posing a problem and eliciting several answers or solutions from the students. The lecture can then go on to explore and build on the suggestions that emerge from the discussion. For example: "When you think about the definition of epidemiology, what possible applications of this methodology come to mind?" "What are some underlying biological factors for poor health status?" "What are some reasons people may not have health insurance?"

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The Beacon is a quarterly publication of The Center for Teaching and Learning. Contact information:

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ASK THE EXPERTS:
"THE IMPACT OF CLASSROOM ATTENDANCE ON ACADEMIC PERFORMANCE"

by Patrick Hardigan, Ph. D.

Q: Does attendance affect, positively or negatively, academic performance?

College faculty often complain about poor classroom attendance, telling us that it demonstrates a lack of respect and that attendance is a prerequisite for good grades. As this is a large topic let me focus on two facets, academic performance and reasons why students do not attend class.

A significant amount of research has looked at the relationship between academic performance and attendance and clearly a link exists between students' attendance and achievement at the all levels of schooling (Kindergarten through graduate school). Depending upon the course and discipline of study the correlations ranged from r= .29 to r = .75. As a reminder, correlation is a measure of association between two variables. It measures how strongly the variables are related, or change, with each other. If two variables tend to move up or down together, they are said to be positively correlated. If they tend to move in opposite directions, they are said to be negatively correlated. Attendance shows a positive correlation with grades, telling us that higher attendance usually means better grades. Interestingly enough, though, this is not necessarily a causal relationship. Let me diverge for a moment to explain this. We must be very careful in interpreting correlation coefficients. Just because two variables are highly correlated does not mean that one causes the other. In statistical terms, we say that correlation does not imply causation. There are many good examples of correlation that are nonsensical when interpreted in terms of causation. For example, centuries ago, Galileo invented the barometer. But since he used water rather than mercury in the tube, his barometer was much larger than the later mercury barometers, because the atmosphere supports a much taller column of water than of mercury. Galileo's barometer went all the way up through the roof of his house and came outside. In order to be able to tell how high the water was on a given day, Galileo floated a wooden figure of a red devil on the water. That way he could keep track of whether the atmospheric pressure was going up or down. Galileo's neighbors began to notice that the red devil came up out of the house on bright sunny days, and went back down inside on rainy days. Having no idea about how atmospheric pressure changes with the weather, the neighbors attributed this correlation to sinister goings-on with the devil. What really set them off was that the red devil kept behaving this way when there was nobody home. He just kept coming out on sunny days, and going back inside on rainy days, on his own. That did it! They broke into Galileo's house and destroyed the barometer.

Now, back to the causal effects of poor attendance. A great amount of research has examined why students do not attend class. Students generally list, in no particular order, the following reasons for not attending class:

- A poor teacher
- Boring class
- Had work due in another course
- They knew the material already
- They felt that they were not learning
- Class size (larger class usually correlates with poorer attendance)
- Self-efficacy or the students' belief that they are unable to complete the work
- The student does not see the relevance of the material

Mandatory attendance policies will increase the number of students attending class; however, in order for students to succeed academically they need to be motivated. And the simplest expression of student motivation is class attendance. The reasons why students do not attend class are not necessarily earth shattering, as I suspect most professors are aware of the rationales. But what should be emphasized is that both the student and instructor share a responsibility for "improving" learning motivations.

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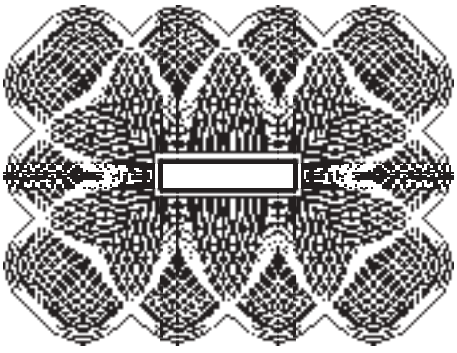

Stan's Soap Box

The lights are dim, the focus is on the screen, there is a passive learning mode, and all of these make a perfect environment for hypnosis. When PowerPoint presentations were first made available, we saw them as a supplement to instruction and they were a great improvement over the old 35 mm slides. The software to make the presentations was quickly learned and we had great results. However, as with all visual aids, the intent was to support instruction, not to replace it.

All of the old-fashioned, traditional teaching tasks like verbally clarifying difficult concepts, relating slide material to the real world, telling good stories that apply to the subject matter, drawing pictures on the overhead to illustrate ideas, and using humor; are all valuable in keeping a balance between PowerPoint technology and older, well-tested teaching techniques.

Students don't need our help to read the slides. They often need help in making good sense out of the material. They need appropriate textbook references. A week before class begins they need well developed handouts with some blank spaces to fill in ideas as the slides are clarified in class. PowerPoint slides that come with medical texts are often well done and comprehensive. Sometimes there is overkill and the slides need to be edited and tailored to the content you stress in your course. Avoid the hypnosis of PowerPoint by using only a few slides to introduce a topic or to summarize at the end of instruction. Sixty minutes of instructional time devoted to viewing slides will put many into a deep hypnotic state. If you see those blurry, glazed-over eyes, beware. Turn off the machine, turn on the lights, throw out a good question and you can reinstate the learning curve.

FOCUS ON EDUCATIONAL RESEARCH:

Expert Performance: Its Structure and Acquisition

K. Anders Ericsson and Neil Charness, American Psychologist August 1994 Vol. 49, No. 8, 725-747.

In nearly every field of human endeavor, the performance of the best practitioners is so outstanding, so superior even to the performance of other highly experienced individuals in the field, that most people believe a unique, qualitative attribute, commonly called innate talent, must be invoked to account for this highest level of performance. Although these differences in performance are by far the largest psychologists have been able to reliably measure among healthy adults, exceptional performance has not, until recently, been extensively studied by scientists.

The study of expert performance has important implications for our understanding of the structure and limits of human adaptation and optimal learning. In the last decades, interest in outstanding and exceptional achievements and performance has increased dramatically. Many books have been recently published on the topic of genius (for example, Gardner, 1993a; Murray, 1989a; Simonton, 1984, 1988b; Weisberg, 1986, 1993), exceptionally creative individuals (D. B. Wallace & Gruber, 1989), prodigies (Feldman, 1986; A. Wallace, 1986), and exceptional performance and performers (Howe, 1990; Radford, 1990; Smith, 1983). Of particular interest to the general public has

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Quotes to Brighten Your Day

Nine Promises That Can Bring Happiness

1) Promise yourself that you will talk health, happiness, and prosperity as often as possible.

2) Promise yourself to make all your friends know there is something in them that is special and that you value.

3) Promise to think only of the best, to work only for the best, and to expect only the best in yourself and others.

4) Promise to be just as enthusiastic about the success of others as you are about your own.

5) Promise yourself to be so strong that nothing can disturb your peace of mind.

6) Promise to forget the mistakes of the past and press on to greater achievements in the future.

7) Promise to wear a cheerful appearance at all times and give every person you meet a smile.

8) Promise to give so much time to improving yourself that you have no time to criticize others.

9) Promise to be too large for worry, too noble for anger, too strong for fear, and too happy to permit trouble to press on you.

John Wooden with Steve Jamison, *Wooden: A Lifetime of Observations and Reflections On and Off the Court*

TWENTY WAYS TO MAKE LECTURES MORE PARTICIPATORY

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3. An interesting way to introduce topics you will cover in a course and to find out students' assumptions is to ask students to jot down answers to some questions on their own and then combine answers in a small group. Examples from a pre-course survey: "List up to 10 major environmental disasters. Name up to 10 health disorders in which environmental agents are causative; list the 10 etiologic agents. Identify up to 10 national (U.S. or other) environmental laws and the problems they address. Identify the kinds of data needed to characterize an environmental health hazard. List the steps in quantitative risk assessment. Which steps require both epidemiology and biostatistics."

Inviting participation

4. Create an atmosphere that encourages student participation by using a conversational tone and not criticizing student questions or comments in front of the class. Students take a risk when they talk; you need to deal tactfully with their contributions. Your body language; whether you hold yourself in a stiff or relaxed manner; also influences student participation. Consider moving closer to the students rather than speaking from behind the podium. Explain your reasons for varying the traditional lecture style. Students more willingly participate in class if they understand the rationale behind an approach that may be unfamiliar.

5. If you want students to talk, look at them. Some teachers call on students. (Some teachers never call on students; this is a matter of strong personal preference.) Asking students to speak in class is easier to do if they use name cards or if you have learned their names. This will encourage them to use each others' names as well; people are more likely to talk when they know each other. Some students will be too shy to speak in a large group, at least at first. If speaking in class is the norm and everyone is expected to do it, you can call on everyone in good faith (perhaps calling on better prepared; and bolder; students first, and asking easier questions later of the quieter students).

6. Invite challenges to your ideas. This can lead to lively debates and shows that students are thinking and engaging with the material. Also, invite questions. You may have to help students new to a field know how to challenge or question. One way to do this is to present different points of view on any given topic, and then state why you believe a certain view best accounts for the evidence. (Decide whether you are comfortable with interruptions or whether you want to have a question time at the end.)

7. When a student asks a question, instead of answering yourself, ask for an answer from other members of the class. In a large group, always repeat a question or paraphrase a response before going on, so that all students can hear and understand (this is especially important when students in the class do not speak English as a native language).

Punctuating the lecture with questions

8. Ask questions throughout the lecture, so that the lecture becomes more of a conversation. Asking students to raise their hands (for example, "What is the direction of the data: increasing? decreasing?") is easier than asking them to speak. Questions with surprising answers can engage students' interest (for example, "What is the probability that two people in this room have the same birthday?") Generally, questions are more evocative if you are not looking for one right answer. The most fruitful questions are thought-provoking and, often, counterintuitive. For example, when comparing health indicators of different countries, ask students to guess where the U.S. or their country of origin ranks. Discuss the link between socioeconomic status and health; ask students to predict changes over time. For example, "Do you think it has gotten better or worse in your country over the last twenty years?"

9. Pause in the lecture after making a major point. Show students a multiple-choice question based on the material you have been talking about. (Example: "If the incidence rate of tuberculosis (TB) increased due to an increase in immunocompromised AIDS patients, but the duration of tuberculosis infections remained the same, the prevalence of TB would a) increase, b) decrease, or c) not change.") Ask students to vote on the right answer, and then turn to their neighbors to persuade them of the answer within the space of two minutes (talking to a few people is easier than speaking up in a large group). When time is up, ask them to vote a second time. Usually far more students arrive at the correct answer when voting the second time.

10. If readings have been assigned for a class, refer to them so their purpose is clear. You may ask questions about the readings from time to time; individuals or groups might be asked ahead of time to prepare short presentations of their interpretations of the readings.

11. When using slides, maps, or handouts, ask students what they see before you tell them what you see. Use these devices to help students think about a problem as you introduce it. For example, show a map of where cases occurred during an epidemic. Ask the students, "As an investigator of the outbreak, what questions might you want to ask?" Show a table of data about a country (birth rate, death rate, population, per cent of population with heart disease, number of nurses per capita, money spent on health per capita, G.N.P., etc.) Ask, "What do these data tell us? Where would you begin to explore? What kinds of

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questions could we answer and how?"

Varying the format

12. To vary the traditional lecture format, ask students, by section, to make presentations, do role plays, illustrate a position dramatically, debate a point. Or, ask TAs to give short presentations on areas of their expertise. Then invite the whole class to discuss the points illustrated.

13. For debates in a large group, divide the room into two or four groups, assigning one role or position to each group. Have the groups caucus separately to develop their positions before the debate begins. For example, in discussing the positive and negative aspects of a policy approach or community health intervention, divide the room in half for split brainstorming sessions; one group focusing on the positive and the other focusing on the negative. If there is time, have the groups switch positions. Or use the format of public hearings, with one group representing those who have called the hearings, and other groups representing the different protagonists.

14. Use cases to exemplify the issues you want to convey, and conduct the class as a case discussion rather than as a lecture. Cases are particularly useful for practical, how-to teaching situations; for problem-solving or showing how experts solve problems; for situations in which there are a number of right answers; for integrating and applying complex information. In public health, cases can demonstrate policy and management problems, stimulate discussion of various ethical issues in health care, or provide realistic examples of the application of theory and particular methodologies of health care practice.

15. Stop the lecture and ask students to write for one or two minutes in response to a particular question. Then ask them to discuss the question. The writing will give everyone a chance to think about and articulate a response, and may enable broader participation.

16. Let students go to the board to write the results of work in a small group. For example, in the first part of class ask for the strengths and weaknesses of an intervention study. Then divide the room into groups, each with the task of designing a better study with the same exposure and outcome. Groups can go to the board (preferable to asking one student at a time to be at the front of the room) and a spokesperson can present the group's ideas.

Closing the lecture

17. Allow time for questions at the end of lecture. Ask if there are any questions or if students would like to have a point clarified. If your schedule permits, come early to lecture or stay late to answer questions and engage in discussion with students. If you are available five or ten minutes before and after class, some students will talk with you more readily, and you will get to know them and their thoughts. If beginning early and ending late creates a conflict for other colleagues assigned to lecture in the same room, talk with students in the halls before and after class.

18. Use lectures to set up problems or propose study questions for discussion that students are expected to prepare for lab or section. End the lecture with a provocative question. Ask the TAs to begin lab with a discussion of that problem or issue.

19. At the end of your lecture, or at any other appropriate stopping point, give students a one-question "quiz," based on the material just covered in the class. Ask them to answer the question collectively. Leave the room so that they can discuss the question for ten or fifteen minutes. Then return and have them report their answer; discuss with them the reasons for their choice.

20. Do a one-minute paper at the end of class. In this exercise, students write down what they consider (a) the main point of the class and (b) the main question they still have as they leave. You can use some of these questions to begin the next lecture, or students can be asked to bring them to section or lab. One advantage of this technique is that students may listen more carefully and review their notes thoughtfully.

Adapted from *Participatory Lectures*, Derek Bok Center for Teaching and Learning, 1992. Revised for distribution at the Harvard School of Public Health, 1994. Comments and suggestions are welcome. Ellen Sarkisian (617-495-4869; ESARK@FAS.HARVARD.EDU)

Contributing faculty and teaching assistants for their suggestions about questions related to public health: Iain Aitken, Paul Catalano, Marlene Goldman, Lynn Marshall, Marcello Pagano, Sherri Stuver, Ann Scheck, Harvard University.

FOCUS ON EDUCATIONAL RESEARCH

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been the remarkable ability of idiot savants or savants, who in spite of a very low general intellectual functioning display superior performance in specific tasks and domains, such as mental multiplication and recall of music (Howe, 1990; Treffert, 1989). The pioneering research comparing the performance of experts and beginners (novices) by de Groot (1946/1978) and Chase and Simon (1973) has generated a great deal of research (Chi, Glaser, & Farr, 1988; Ericsson & Smith, 1991b). A parallel development in computer science has sought to extract the knowledge of experts by interviews (Hoffman, 1992) to build expert systems, which are computer models that are designed to duplicate the performance of these experts and make their expertise generally available. These efforts at artificial intelligence have been most successful in domains that have established symbolic representations, such as mathematical calculation, chess, and music (Barr & Feigenbaum, 1981-1982; Cohen & Feigenbaum, 1982), which incidentally are the main domains in which prodigies and savants have been able to display clearly superior performance (Feldman, 1980, 1986).

Counter to the common belief that expert performance reflects innate abilities and capacities, recent research in different domains of expertise has shown that expert performance is predominantly mediated by acquired complex skills and physiological adaptations. For elite performers, supervised practice starts at very young ages and is maintained at high daily levels for more than a decade. The effects of extended deliberate practice are more far-reaching than is commonly believed. Performers can acquire skills that circumvent basic limits on working memory capacity and sequential processing. Deliberate practice can also lead to anatomical changes resulting from adaptations to intense physical activity.

The study of expert performance over the life span of the performers is still needed though. This perspective is quite likely to provide new insights into the plasticity of the structure of human performance as a function of different developmental phases. Through investigation of focused sustained practice, it may be possible to determine which aspects can and, at least with the current training methods, cannot be modified to enhance current and future performance. Of particular practical and theoretical interest are those factors that enable experts to retain and maintain superior performance into old age.

Reminders

The next session of the Stats Boot Camp series is:

Friday, February 11, 2005 12:00-1:30p.m.

Wallace Marsh

"Reliability and Validity"

The next session of the Faculty Development series is:

Thursday, February 24, 2005 12:00-1:30p.m.

Marcelo Castro & James Pann

"Assesment of Student Learning"

Chancellor's Dining Room, 5th Floor Terry Building
RSVP: Kathleen Hagen ext. 1235 or khagen@nova.edu

Ideas for our next issue

If you have a great teaching technique, let us know and we'll share it with your colleagues.

Caught in the act - tell us good things you've seen faculty do!