# Educational Reform: Why The Academy Doesn't Change

*by Mark Benvenuto*

In recent years the broad idea of improving the education of college and university students—specifically, by overhauling the traditional lecture—has been been at the center of numerous discussions about the future of the academy.[1-3] The intensity of those discussions might lead one to believe that traditional lectures were on the cusp of vanishing. But this is hardly the case. The traditional lecture is alive and well, the pace of change so slow as to be almost undetectable.[4,5]

What we now think of as the traditional lecture—an instructor stands and speaks, while the students sit, listen, and take notes—has a notably long history. In 1809 the *Edinburgh Review* waxed eloquent about this accepted student-teacher arrangement: "(T)he beauty of the system," it wrote, "is that nothing is trusted to the (student) himself: he does not merely repeat the lesson before a superior, but he learns before a superior."[6]

Sadly, this dynamic has remained virtually static over the centuries. Though numerous studies have shown that actively involving students in discussions helps them better retain information and develop higher-

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order thinking skills, a majority of faculty in this country still utilize the traditional lecture as their primary instructional strategy.[7] Indeed, despite new classroom technologies that could dramatically energize the student/professor exchange, despite volumes that have been written on a host of innovative ways to improve teaching generally, the traditional lecture hangs relentlessly on.

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This is distressing. It is also alarming, because for at least three decades, government organizations have been funding projects—it appears futilely—that have been designed to turn the tide. Consider the efforts by the National Science Foundation (NSF). Nearly 30 years ago it awarded grants for research projects by faculty interested in developing and promoting a more innovative science curriculum, along with new ways to teach it. A snapshot of some of these noble research goals was evident in several summaries of research done in 1974.

- "The primary purpose of the…award was to provide the catalytic agent needed to expedite the development of existing and projected programs in scientific and related areas by means of renewed faculty interest in advanced study and research, development of undergraduate capability for research and teaching, new areas of study, contact with off-campus scientists, and improved laboratory facilities."[8]
- "The purpose of this project was to develop new curricula, to design new and revise old courses, to further the training of certain staff workers…"[9]
- "The scope of the science program…was broadened and given new dimension by concentrating improvement efforts on the development of a cross-disciplinary curriculum…"[10]

In 2002, it appears, the same work was being pursued, as evidenced by these abstracts by these grants winners:

- "The objective is to restructure physical chemistry laboratory courses by creating a set of real-world, inquiry-based experiments that reflect current practice…"[11]
- "The modules will utilize interactive computer visualization and molecular modelling techniques, will emphasize discovery and active learning and will be adaptable for both beginning and advanced students."[12]

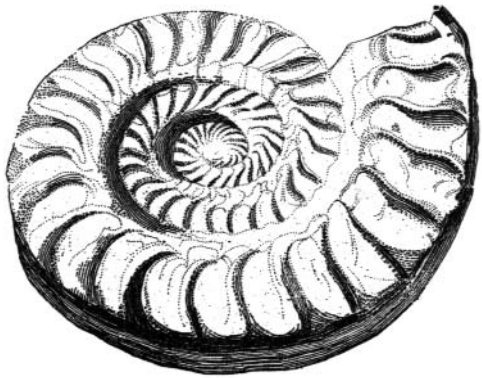
- "There is a critical need to engage introductory science students in an experimentation mode that will lead to student-driven inquiry. This project aims (1) to allow students to use active experimentation to learn abstract topics, (2) to incorporate scientifically realistic modes of inquiry into instructional technology, (3) to build a library of experiments that is adaptable to any curriculum…"[13]

Apparently, educational reform is either remarkably slow, or simply not catching on. Why? Mainly, because formidable roadblocks exist—in the form of students, teachers, and administrators. And though the problems manifest across disciplines, they are particularly evident in my area of study—science and engineering—where creativity and innovation often fall victim to the faculty impulse to serve up "just the facts."

In this article I explore these impediments to reform, but the analysis is in no way meant to be exhaustive. It is based in large part on studies, but mainly on personal observations and experiences as a professor for many years, and on numerous conversations I have had with faculty and students across the country.

That students themselves could be a hindrance to a better classroom experience is ironic, considering they are the ones who would benefit from improvement the most. They often pay exorbitant fees to attend college, and so would logically want only the best. Why, then, would they eschew an interactive or group learning experience that ensures better comprehension and retention of their course material?[14]

First, there's familiarity—a powerful factor. Traditional aged students simply appear more comfortable with the two-century old model of the teacher standing in the front of a class and giving information, usually orally, often with some visual aids—even if that aid is nothing more complex than a chalkboard. Non-traditional students, who are usually older, are no different; if anything, they're even more attached to this model. It is not surprising why. All these students have survived high school, where this model of teaching is still used, and where they may



well have flourished with its practice. They prefer the status quo because change is often uncomfortable. It moves students into the unknown, and importantly, may result in them not performing quite as well.

I have presented ideas for educational reform on numerous occasions,[15] and have asked audiences to guess which students might be the ones to complain the loudest about a new teaching method. From audiences not composed of teachers and faculty, the answer that comes back repeatedly is: "The student who is receiving an 'F.'" But from audiences of high school and college faculty, the answer is always: "The student who is receiving a 'B.'"

In my experience the latter answer is usually the more accurate one. It's not a fear of complete failure that rattles students who are introduced to a new method; it is the fear of losing a letter grade. There are, however, plenty other incentives for students to embrace the familiar.

One is that the traditional lecture is passive—and this means it is easy. The most usually demanded of students in this format is that they answer a couple of broad, often rhetorical questions from the instructor. A large lecture format offers the comfort of anonymity, and the assurance that if students arrive unprepared for the lecture, there will be no punishment for their lack of preparation. In a format where they must interact with the instructor or their classmates, whether it is answering pre-assigned questions from a textbook, or presenting information for the class, it is much harder to get away with attending class unprepared.

It is difficult to precisely measure how this element of passivity ranks as a factor in student's embrace of the traditional lecture. But based on samplings of course evaluations across disciplines, it appears to be a significant one.[16] Through conversations with students enrolled in a chemistry lab class taught by myself, as well as with students in liberal arts classes taught by others, I've found that students actually like having the opportunity to mask their disengagement. Even in liberal arts lectures, where the professor insists on some level of discussion, students who have not prepared boast that they can often sail through a class without consequences simply by agreeing with or embellishing the comments of a prepared student. No such delicate dancing is even required, they say, in traditional science or engineering lectures—precisely because the lecturer spends almost the entire period doling out large volumes of information, usually with few questions. No punishment is handed down for a student who has done no preparative work.

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One former student commented that for most lecture classes, he did not study at all in advance. Rather he said, "I take really good notes, then read the sections from the book, then do the problems. Most teachers don't ask anything harder on the test." This comment, incidentally, was made while complaining about my expectation that he be able to solve problems on exams that happen to be more than just slightly modified text questions. Doing anything out of the norm, then, can raise student ire. Particularly in the science and engineering disciplines, the slightest change in format can be seen by some students as "radical." Requiring small groups to present lecture material while the faculty member acts as a moderator and a "safety" to ensure the accuracy, for instance, can be heresy—even though experienced educators know that such a change is really only the adoption of a well-established, liberal arts discussion model.

Recently, in one such circumstance in which I insisted that student groups shoulder portions of the class material for presentation to their peers, one student wrote on a mid-term course evaluation, "I feel that I pay to come to college so that I can learn from a professor. I don't feel that I should have to teach everything to myself and that is what is happening." The previous year in a similarly taught class, one student put it far more bluntly, when he scrawled in huge letters on a course evaluation, "Get up to the f*cking board!" These students and others like them see the process of receiving an education only in terms of a professor speaking and students listening while taking notes. They don't want to have to do more.

A third reason students may not want to change from the traditional lecture format is sheer laziness. They are aware that in the standard lecture they can opt not to attend class and still get good notes from a friend or the course textbook. If a faculty member teaching in the traditional manner allows absenteeism—and many faculty believe that students should be responsible enough that taking attendance is unnecessary—what incentive is there for a student to attend a lecture that might be considered boring? Or, why should a student attend a class in which they feel they already are getting the information satisfactorily from a text, or from the notes of a classmate?

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I have encountered many instances in which students who admittedly do not attend class then complain they are doing poorly on weekly quizzes, even though they are reading the text. One student went so far as to sign up for another class at the exact same time as my own, with intentions of attending my class only for the tests, because her previous grade point average was so high. To her a class meant a traditional—probably boring—lecture she felt entitled to miss, even though my syllabus clearly stated class attendance was expected and participation would be figured into a student's grade.

A final reason students may dislike moving from the standard lecture, especially to a group learning model, relates to the varying paces at which people learn. The students who do grasp the material quickly recognize that those who don't grasp material as quickly hold back the larger group. But while this can be irritating and frustrating for the student who already has understood an idea, in the standard lecture, this student only needs to wait—not work—while the instructor repeats information to those students who need to hear it again).

The slower students prefer this approach, too, for with a more interactive method their gaps in knowledge are exposed—painfully. It is a sad truth, but years of teaching have proved to me that students would rather fail an entire course in the long run than admit to their classmates that they do not know something. I have asked students about this in lecture and lab and received an oft-repeated answer: They don't like to be embarrassed. As one student put it, "If I miss the discussion class where I'm not ready, I won't be embarrassed in front of my friends. Plus, I can always tell myself I'll learn it by test time."

Faculty resistance to change has roots in many places, and I cannot begin to tackle them all here. But I will explore a few—some of which, perhaps not surprisingly, parallel reasons for student resistance.

First, for many faculty members, the traditional lecture method appears to be working just fine. Their measure is the success of their graduates. If the students are being placed successfully in jobs, or are moving on to professional or graduate schools at the same rate or a higher rate than the graduates of neighboring universities, why change pedagogical techniques? In other words, "If it ain't broke, don't fix it!"[17]

Of course, this assumes—illogically—that these college or university graduates can do no better academically than they are doing. It also suggests a comfort level with the standard teaching approach similar to the students': Where the student is comfortable receiving the same old lecture, the faculty member is comfortable giving it. Innovation, then, gives way to reticence, even laziness, and everybody remains happy in their roles.

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Another reason faculty may be loathe to change the standard lecture is money. This issue takes on different manifestations depending on the focus of the college or university in question. In universities where a faculty member is expected to generate extramural funding and publish in peer-reviewed journals, teaching is a secondary function, and therefore one should spend as little time as possible on it. The lecture doesn't require exhaustive preparation for a faculty member, especially after the first time teaching the course. But to assign students into groups, meet with them outside of regular class hours, work with them on out-of-class assignments, create class discussion questions—all this takes time that could be used for research or proposal and paper writing. After all, research is what garners notice for the institution and attracts students.

One of the most riveting personal examples of this "research and grants over all" mentality came in an exchange with a respected colleague at a large, research institution. This person first congratulated me for winning a university science teacher of the year award, which was determined by student votes. Then he noted that if one of the untenured faculty members at his university had won such an award, the rest of the faculty would wonder why he or she was wasting so much time on teaching.

The money issue manifests differently when examined from the smaller school's point of view. Instructors who use a technique other than the traditional lecture run the risk of chasing away students who may want to

declare a major within a particular department. The logic here is that if students are content with the standard lecture, then making them work harder could spur their exit to another department, or even another institution. Even if the new technique imparts more information to the students by way of out-of-class projects, small group discussion sessions, or interesting homework assignments, such innovations can be viewed as a detriment to the department if the overall number of majors ultimately dips, because this equates with a dip in tuition revenues.

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Another roadblock for faculty is their inability to judge how well a new technique is working, because there are so few benchmarks against which to measure it. It doesn't matter that peer reviews may be positive, tests still are widely considered the definitive measure of how well students have learned. But exams, particularly in science and technology, are by-and-large quantitative. Science and engineering majors, for example, must take the MCAT, DAT, and ABET examinations[18]—essentially multiple choice tests—for entrance into professional schools, or for professional licensing. Special, preparatory classes for those exams are loaded with multiple-choice exams, too. It is easy, then, to judge performance on such tests and compare results nationally. It is a wholly different proposition to quantify how much an interactive teaching technique helped students—unless there is some direct, measurable link to an increase in test scores.

Although faculty seem to take a certain amount of joy in complaining about their administrators, it is probably fair to say both that most university administrators do want their faculty to be excellent teachers—and that faculty know this. Further, most administrations will support novel teaching techniques (though the cynical faculty member might comment that support comes far more quickly when it involves no financial outlay on the part of the college or university.

The two main administrative resistances to removing or radically modifying the standard lecture are, first, that the administration is often uncomfortable trying to evaluate a new technique, and second, that many of these newer teaching techniques work best when applied to smaller class sizes.

This first point is significant because once an administrator can no longer gauge how well students are learning, the job of running a college or university becomes pointless.

It is quite easy to evaluate a professor standing and delivering a traditional lecture; most administrators have taught that way themselves. One can determine quickly, for example, if the professor is speaking clearly, whether student questions get answered or assignments are clear. Change the lecture into a teach-ing/learning situation in which, say, the professor poses a question, stops the lecture while the students discuss it, circulates among student groups, then compares and discusses the student answers, and assessment necessarily must takes a different form. If the professor purposely makes a portion of the class ambiguous in order to make students think, evaluation methods really have to be overhauled.

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I have often designed experiments with intentionally vague instructions on how to manipulate the chemical materials involved. I have found this forces students to think more seriously about how to approach lab work—not simply read directions that walk them through every specific piece of glassware to pick up and so on. Unfortunately, when students evaluate the lab, they often mark a low score for the part which asks whether "directions were clear and concise." This, in turn, lowers the overall course evaluation number. And that suggests to the administration that I am not teaching the course well.

The second reason for administrative resistance to reform is financial in nature. The large lecture format remains an unbreakable, economic champion for universities large and small. Because many teaching reforms work best with smaller groups of students, they become costly to institute. When faculty ask their administration for smaller classes, the same number of students ultimately will be taught, but more faculty have to be employed. That, in turn, means considerably more financial outlay. Why, then, would a university or college want to turn a lecture hall of 300 students and one professor into 10 sections of 30 students with one professor and nine teaching assistants—or worse, to 10 professors? From an administrator's point of view, such a switch simply costs too much in additional salaries—and renders dubious, unproven rewards.

It would hardly be proper to discuss some of the impediments to a more effective learning experience without making some suggestions about how to overcome them. The following may not be a solution that can be fully implemented at any one college or university, but it encompasses starting points from which many faculty should be able to work.

1. Begin now. Initiate one change or reform that you have heard about, without waiting for the perfect time, place or situation to arise. Add more reforms, even if they are only small ones, as one semester ends and another begins. There will never be some "perfect time" for improving the classroom experience. We as educators must make the present our own "perfect time."

2. Emphasize to the students how the new technique will improve the class to lessen their fear of the unknown.[19] By inviting faculty, colleagues, and administrators to sit in and review a new technique, they, too, lose some of their fear of the unknown, and have the opportunity to buy into and become part of the new idea or method.

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3. Build in "safety nets" or practices that encourage student participation in innovative classroom activities without fear of punishment for poor results. An example would be having groups turn in answers to a discussion question anonymously. Wrong answers could then be discussed without exposing a specific group or person's ignorance.

4. Look at your existing assessment mechanisms and determine how they can be adapted before the end of your first "reform semester." By showing how an existing assessment tool, such as a course evaluation, can still be used with a new technique, administrators and other faculty may become more comfortable with the new technique. And students still have a means to provide feedback.

Teaching reform has proceeded in fits and starts for decades. In some academic disciplines, we have already moved away from traditional lectures to a large degree. In others, the lecture format disappointingly remains the norm. The move to a more interactive mode of teaching—whether through group learning, group discussion, teacher-student question and answer sessions, or some other method, needs to occur in all disciplines to ensure that each student receives the best education she or he can. Elements of risk are involved in such change. But we as faculty must take those risks to ensure that educational reform doesn't become an endless discussion—with no results. nea

# ENDNOTES

[1] AAAS, 1990.

[2] Advisory Committee to the National Science Foundation, 1996, 1998.

[3] Tobias, 1992.

[4] Benvenuto, 1999.

[5] Barrow, 2000, including Author's Postscript.

[6] Schwab and Brandwein, 1961.

[7] Gardiner, 2000.

[8] National Science Foundation, 1974, 53.

[9] Ibid, 57.

[10] Ibid, 75.

[11] http://www.fastlane.nsf.gov/servlet/showaward?award=9752195.

[12] http://www.fastlane.nsf.gov/servlet/showaward?award=9752577.

[13] http://www.fastlane.nsf.gov/servlet/showaward?award=9816444

[14] AAAS, 1990.

[15] Project Kaleidoscope, 2000.

[16] Daley, 1999.

[17] Believed to have first been uttered by a Greek sergeant upon completion of the Trojan horse.

[18] MCAT is the Medical College Admission Test, DAT is the Dental Admission Test, ABET is the Accreditation Board for Engineering and Technology.

[19] Ellsworth, 1999.

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