# FACULTY DEVELOPMENT: GETTING THE SERMON BEYOND THE CHOIR

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A reform movement has been active in higher education for several decades. The proponents of change argue that the traditional teacher-centered approach to classroom instruction, which emphasizes lecturing, individual effort, and competition for grades, is not particularly effective for promoting learning and skill development. They claim that a more balanced approach incorporating active, inductive (discovery), and cooperative learning improves the chances of achieving almost every conceivable educational objective, including depth of learning, length of information retention, development of problem-solving, communication, and teamwork skills, attitudes toward subjects and increased motivation to learn them, and self-confidence. They offer an impressive array of learning theory-based and classroom research results to support these claims.

These efforts notwithstanding, if you walk down the corridor of all but a handful of engineering schools and look into classrooms, you would see little different than you would have seen forty years ago. Most engineering professors are still exclusively lecturing in all their classes and assigning exclusively individual homework. They may have heard about some of the alternative instructional approaches that a few of their colleagues have been carrying on about, but they dismiss these approaches as impractical, excessively time-consuming to implement, or "spoon-feeding."

There are a number of reasons for this faculty resistance, most of which have at their base the inescapable fact that time is generally faculty members' scarcest and most precious resource: there is never enough of it to do the things we have to do and want to do. First-class research— writing proposals and doing the things necessary to get them funded, supervising graduate students, attending and presenting at conferences, writing papers, and actually planning and carrying out the research—is a full-time job. First-class teaching—planning and updating lessons, creating appropriately challenging but fair homework assignments and examinations, learning about, importing, and implementing new instructional methods and materials, doing classroom research and curriculum development and presenting and publishing the results, and dealing with the myriad of problems that students routinely present (classroom management, cheating, emotional problems, etc.)—is also a full-time job. There is a limit to how many full-time jobs one individual can hold down.

Faculty members find different ways of dealing with this dilemma.

1. *The superhuman professors.* Some faculty members manage to put in the time needed to do excellent jobs of both research and teaching, but there are not nearly enough of them to populate our faculties.

2. *The pre-retirement retirees.* Some manage to get tenure and thereafter do little or no research and poor to adequate teaching. Fortunately, there are not too many of this type either.

3. *The researchers.* These faculty members—a few at some institutions, a large number at others—have no real interest in teaching. They joined a faculty to pursue their research in an environment that grants them almost complete autonomy, and the only reason they teach is because it is required. They are not about to devote any more time to teaching than they can help.

4. *The teachers.* These have made the decision that teaching is their most important job, and they spend most of their careers refining their craft. Some just teach and teach very well; others are active in educational scholarship—writing texts and instructional software, importing and developing new instructional methods and materials, and attending education-related conferences and publishing in educational journals.

5. *The majority.* Most faculty members value and enjoy both research and teaching, but time constraints force them to put their emphasis on one or the other. Although they would genuinely like to be excellent teachers, they conclude that research is a higher priority and they must devote as much of their limited time as they can to it.

Faculty members in Category 4 and some in Category 1 constitute the choir that faculty developers invariably find themselves preaching to at workshops and seminars. Most professors in Categories 2 and 3 wouldn't go to a teaching workshop at gunpoint. The key to educational reform is Category 5. If those individuals—most faculty members—could be induced somehow to take an active role in reform efforts, the quality of undergraduate instruction would inevitably take a quantum leap upward.

The relegation of teaching to a secondary role by faculty members with a genuine desire to teach well has several causes. Some instructors don't know about alternative instructional methods that could make them better teachers (college teachers are not routinely taught anything about teaching), or they many have heard about the methods but have not seen sufficiently convincing evidence of their effectiveness. Many believe (with good cause) that if they work to improve their teaching and the effort leads to a drop in research productivity, they will lose respect among their colleagues and possibly be denied raises, promotion, and tenure.

Addressing the first cause—lack of knowledge of effective teaching methods and of the evidence for their effectiveness—is the province of faculty developers. Their job is to attract faculty members to programs that present alternative instructional methods, make a convincing case for adopting the methods, and provide support for making the adoption successful. Addressing the second cause—the imbalance in the faculty incentive and reward system—is the province of university administrators. Faculty members are justifiably reluctant to put time and energy into activities that will not advance their careers and could hinder them. If administrators want to improve their institutions' teaching programs, they must find ways to persuade faculty members to make the necessary effort and to reward those who do so successfully.

In the remainder of this paper, we offer ideas for both faculty developers and administrators to achieve these goals.

**Making teaching workshops work**

We have given about 80 teaching workshops on campuses around the world, many of which have been extremely well attended and all of which have enjoyed gratifying responses from most participants. Many of the participants were members of the choir when they came in, but many others were highly skeptical about the value of teaching workshops and came despite their better judgment. (We know because they tell us so after the workshop.) Post-workshop surveys have shown that there has been good follow-through: years later participants were still using methods they had learned about in the workshop, and some of them had offered teaching seminars and workshops on their own campuses.

In this section we will offer nine suggestions for making workshops effective derived from our experience. First, though, we offer two notes on terminology. For brevity, we will use the term "engineers" to denote instructors in engineering, engineering technology, and core courses in the engineering curriculum, and "faculty developers" to denote individuals like directors of teaching and learning centers who have faculty and instructional development as part of their job descriptions as well as individual faculty members voluntarily working to improve teaching on their campuses.

- **Make the workshop content relevant to the participants' courses, students, and problems.** Many engineers fear that teaching workshops will waste their time with hours of irrelevant psychobabble. To counteract this fear, we minimize general educational material that is not clearly linked to the participants' disciplines, use discipline-specific examples of the strategies and devices we recommend (active and/or cooperative learning, instructional objectives, homework and test construction, or whatever), and avoid "games" (e.g. name-learning icebreakers, brain teasers intended to stimulate creative thinking) that have no apparent connection to the participants' disciplines.

- **Include both technical and pedagogical expertise on the workshop facilitation team.** Rebecca's training and professional background are in education and Rich's are in chemical engineering. Our workshops are better than they would be if either of us presented alone because we can bring both backgrounds to bear on the presentation. Combining these areas is, after all, what we are attempting to help the participants to do.

- **Emphasize the content relevance and technical credentials of facilitators in promotional materials.** Once we have tailored our presentation to the needs and interests of engineers, we make this fact clear in promotional materials. We also make prominent display of the fact that one of the presenters is an engineer. Both steps increase enrollment.

- **Keep content practical & ideas easily implementable.** Engineers do not generally go to a teaching workshop in search of philosophical discussions about the nature of learning and the role of the teacher; most want to know what they can do next Monday to make their classes work better. We believe discussion of material from educational and cognitive psychology is acceptable and even desirable, but we bring it in to support the concrete ideas that constitute the bulk of the workshop rather than as an end in itself.

- **Be authoritative.** Most engineers are "thinkers" on the MBTI thinking/feeling scale. They tend to make decisions based on facts, logic, hard evidence, and research, and many are

scornful of anything that might be considered "soft science" or "touchy-feely stuff." Teaching methods that are known to be effective—establishing a need to know new material, linking new material to previously known material, using active and cooperative learning, addressing a broad spectrum of student learning styles—have solid theoretical foundations and are supported by extensive empirical research. We provide handouts with summaries of relevant research results and references, and we are ready with data to meet challenges to the proven effectiveness of the methods we recommend.

- **Don't be dogmatic.** Assertiveness and dogmatism are different things. We are careful not to suggest that our recommended methods represent the only acceptable way to teach. Most professors resent being told that most of what they have been doing in their classes is wrong and that they must either do it differently or accept being bad teachers. Several times in our workshops, we encourage the participants to take a gradual approach to our recommendations, try only a few new methods at a time, keep methods that work and drop those that don't, and work to evolve their teaching rather than revolutionizing it overnight. In our post-workshop evaluations, several participants invariably express appreciation for the freedom we seem to be granting them to choose their own path and set their own pace.

- **Call on the participants' expertise.** Teaching workshop participants always include some individuals who know a lot about the techniques being presented in the workshop and have figured out how to adapt them to their own courses and students. We go to great lengths to elicit these ideas for sharing with the rest of the participants.

- **Be ready for tough questions and difficult (skeptical, hostile) participants.** This advice applies to workshops for any audience but is particularly apt for teaching workshops presented to engineers. Standard references on workshop presentation and public speaking describe strategies for dealing with difficult participants. We suggest that faculty developers brush up on these strategies before presenting workshops until the strategies are familiar enough to use instinctively when necessary. We would also repeat our suggestion to be ready with research backup for proposed instructional methods.

- **Practice what you preach!** The sentiment we most often see in our workshop evaluations is appreciation for the way we model the techniques we recommend. Participants are acutely conscious of whether or not you walk your talk. Since we recommend that the participants write instructional objectives for their courses, we present a set of objectives for the workshop. Since we describe the importance of presenting information visually rather than relying entirely on words, we try to make our presentation graphics look professional. Since we place a heavy emphasis on cooperative learning, we include group exercises of different types in the workshop and later discuss how they work. Since we recommend active learning, we don't just lecture.

## Faculty Development Beyond Workshops and Consultations

Workshops and individual consultations (another staple of faculty development repertoire) are good for motivating instructors to change how they teach and for presenting specific ideas of changes to make. Participants often leave the workshop or consultation with all good intentions and actually start implementing some of the ideas presented. After a while,

though, pressured by time demands, resistance or outright hostility from students and colleagues and a growing sense of isolation, many get discouraged and revert to easier and more socially acceptable traditional methods. For reform to be sustained, faculty members moving in new directions must be made to feel that they are not alone, but are part of a network of similarly concerned colleagues. Here are several ideas for faculty developers to accomplishing this objective.

- **Form an interest group.** Workshop alumni form a logical nucleus for a group that meets periodically (e.g., at a monthly brown-bag lunch) to talk about matters of common interest. Someone in the group should take responsibility for providing a focal issue for the next meeting: it might be a recent paper in *ASEE Prism* or the *Journal of Engineering Education*, or a contribution to an education-related listserver like STLHE or AAHE, or a problem that occurred in the faculty member's class, or anything else that might serve as a basis for discussion. Each new workshop offered on campus should provide fresh recruits for the group.

- **Set up a listserver**. An intranet listserver devoted to educational issues provides a forum for exchanging ideas, questions, answers, problems, recommendations, and jokes.

- **Publish a newsletter**. Every semester or more often, compile and distribute reports of faculty innovations and honors related to teaching, news of upcoming programs, and teaching tips.

- **Facilitate course and curriculum reform programs**. Work with groups of faculty members attempting to revise individual courses, restructure their department's curriculum, or introduce instructional technology or distance learning. Encourage and facilitate multidisciplinary efforts such as curriculum integration (e.g. among mathematics, chemistry, physics, and engineering in the freshman curriculum) or joint planning of courses common to different departments (like the fluid dynamics course in departments of chemical, civil, and mechanical engineering).

## Institutional Incentives and Rewards

There is a limit to how much lasting reform can be accomplished solely through faculty development efforts, no matter how well they are executed. Unless the faculty incentive and reward system is modified to put teaching and educational scholarship more on a par with disciplinary scholarship, only a minority of faculty members will choose to make the sacrifices necessary to change their teaching in significant ways.

Until recently, the incentives and rewards for doing innovative or excellent teaching were limited to a small number of outstanding teacher awards with cash stipends of $1000 or less and a plaque or certificate. (Winning one of these awards is considered the kiss of death for untenured faculty members on many campuses, proof that they are not giving sufficient priority to their research.) In the last five years or so, however, the pendulum has begun to swing back toward a reasonable balance point on the research/teaching continuum, with some institutions taking tentative but real steps to promote educational reform.

There are several motivating factors for this shift. One is a growing backlash from governing bodies—legislatures and Boards of Governors, Trustees, and Regents—against how far the pendulum had swung from undergraduate education. Another is the recognition that if ABET actually enforces Engineering Criteria 2000 when it becomes the universal accreditation system in 2001, departments that do not take meaningful steps to improve undergraduate education will risk losing accreditation. Still another is the major funding for educational reform provided in recent years by the NSF through its Division of Undergraduate Education and the Engineering Education Coalitions.

Prompted by some or all of these factors, many institutions have begun to provide tangible (as opposed to rhetorical) incentives for faculty members to teach as well as they are capable of teaching. The institutions are also giving real credit in faculty evaluations to participation in faculty development programs, importing or developing alternative teaching methods, modernizing courses and curricula, writing textbooks and instructional software, and serving as teaching mentors to junior colleagues.

One incentive is to give a large number of teaching awards with reasonable stipends and/or a small number of awards with stipends of $5K–$10K, both of which justify making a serious effort to win one. A broader and probably more effective course of action is to make educational scholarship and disciplinary scholarship comparable in the promotion and tenure system. At some institutions, faculty members detail their contributions in both education and research—grants, publications, new materials developed, evaluations received, honors awarded, etc.—in their annual activity reports. If excellence in research and adequacy in education is considered adequate for advancement, then the converse is treated in the same manner. If professors who do an inadequate job of research are denied tenure, then so are professors who do an inadequate job of teaching. Once one or two stories start to circulate about weak teachers with strong research records being denied tenure, faculty interest in improving teaching tends to grow dramatically.

A few institutions have implemented a contract system, wherein faculty members are allowed to specify the percentages of their effort that they wish to allocate to teaching, research (including educational research), and service, subject to rules about minimal allocations in each area. Their contributions in each of these areas are evaluated based on their annual reports (or, for those who allocate a large percentage of their time to teaching, formal teaching portfolios), and their overall performance rating is a weighted average of their ratings in the three areas, with the weighting factors being their allocated percentages. If faculty members say that they are focusing on teaching and educational scholarship, their advancement would depend primarily (but not entirely) on how well they carried out that function, and similarly those who claim to be primarily researchers would advance primarily on the basis of their research accomplishments.

Finally, some administrators have begun to realize that many corporations and most alumni are more interested in undergraduate education than in graduate research. These administrators are successfully soliciting contributions targeted toward general improvements in the undergraduate teaching program or toward specific educational initiatives (making advances in technology-based instruction, improving communication and teamwork skills, increasing the level of industrial experiences provided to engineering undergraduates who are not in the co-op

program, and so on).  The extreme of this trend was realized at a major research university several years ago, when a wealthy alumnus donated one hundred million dollars to the school of engineering and specifically earmarked it for improving undergraduate education.

There can be little doubt that if some of these steps were taken at an institution, interest in faculty development activities would increase and there would no longer be a need for symposia on how to get faculty buy-in to effective teaching.  Taking the steps might not bring in $100,000,000, but we can do a lot with a lot less than that.

## Acknowledgment

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