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HOW TO IMPROVE TEACHING QUALITY

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An announcement goes out to the faculty that from now on the university will operate as a total quality management campus. All academic, business, and service functions will be assessed regularly, and quality teams will plan ways to improve them. A campus quality director and a steering team are named, with the director reporting to the Provost. All university departments appoint quality coordinators, who attend a one-day workshop on quality management principles and return to their departments to facilitate faculty and/or staff meetings at which quality improvement is discussed.

Many faculty members are irate. They argue that TQM was developed by and for industry to improve profits, industry and the university are totally different, and talking of students as "customers" is offensive and makes no sense. They make it clear that they will have nothing to do with this scheme and will view any attempt to compel them to participate as a violation of their academic freedom.

What happens then is…practically nothing. Some changes are made in business and service departments, some curricula are revised, and a few instructors make changes in what they do in their classrooms but most go on teaching the way they have always taught. After two or three years the steering committee writes its final report declaring the program an unqualified success and disbands, and life goes on.

Higher education discovered total quality management in the 1980s and quickly became enamored of it. Books like *TQM for Professors and Students* (Bateman and Roberts 1992) and *Total Quality Management in Higher Education* (Sherr and Teeter 1991) declared that TQM could serve as a paradigm for improving every aspect of collegiate functioning from fiscal administration to classroom instruction. Terms like "customer focus," "employee empowerment," "continuous assessment," and "Deming's 14 principles" started appearing with regularity in education journals and in administrative pronouncements on campuses all over the country. Deming himself suggested the linkage between quality management principles and education, claiming that "…improvement of education, and the management of education, require application of the same principles that must be used for the improvement of any process, manufacturing or service" (Deming, 1994).

Some academic programs and many individual faculty members have tried applying quality principles in their work. Recent papers in engineering education describe quality-based models for classroom instruction (Jensen and Robinson 1995; Shuman et al. 1996; Stedinger 1996; Latzgo 1997; Karapetrovic and Rajamani 1998), curriculum reform and revision (Bellamy et al. 1994; Litwhiler and Kiemele 1994; Summers 1995; Houshmand et al. 1996; Shelnutt and Buch 1996), and department program planning and administration (Diller and Barnes 1994). Nevertheless, after more than a decade of such efforts, TQM has not established itself as the way many universities operate, especially in matters related to classroom instruction.

Our concern in this paper is specifically with teaching, as opposed to academic or research program structure and administration. We first consider how an instructor can improve the quality of instruction in an individual course, and then the more difficult question of how an academic organization (a university, college, or academic department) can improve the quality of its instructional program. In both cases, we examine the potential contribution of quality management principles to teaching improvement programs in light of the cultural differences between industry and the university.

IMPROVING TEACHING QUALITY IN AN INDIVIDUAL CLASS

We may define good teaching as instruction that leads to effective learning, which in turn means thorough and lasting acquisition of the knowledge, skills, and values the instructor or the institution has set out to impart. The education literature presents a variety of good teaching strategies and research studies that validate them (Campbell and Smith 1997; Johnson et al. 1998; McKeachie 1999). In the sections that follow, we describe several strategies known to be particularly effective.

Write instructional objectives

Instructional objectives are statements of specific observable actions that students should be able to perform if they have mastered the content and skills the instructor has attempted to teach (Gronlund 1991; Brent and Felder 1997). An instructional objective has one of the following stems:

- *At the end of this [course, chapter, week, lecture], the student should be able to* ***
- *To do well on the next exam, the student should be able to* ***

where *** is a phrase that begins with an action verb (e.g., *list, calculate*, *solve*, *estimate*, *describe*, *explain*, *paraphrase, interpret, predict*, *model*, *design*, *optimize*,…). The outcome of the specified action must be directly observable by the instructor: words like "learn," "know," "understand," and "appreciate," while important, do not qualify.

Following are illustrative phrases that might be attached to the stem of an instructional objective, grouped in six categories according to the levels of thinking they require.

1. **Knowledge** (repeating verbatim): *list* [the first five books of the Old Testament]; *state* [the steps in the procedure for calibrating a gas chromatograph].
2. **Comprehension** (demonstrating understanding of terms and concepts): *explain* [in your own words the concept of phototropism]; *paraphrase* [Section 3.8 of the text].
3. **Application** (solving problems): *calculate* [the probability that two sample means will differ by more than 5%]; *solve* [Problem 17 in Chapter 5 of the text].
4. **Analysis** (breaking things down into their elements, formulating theoretical explanations or mathematical or logical models for observed phenomena): *derive* [Poiseuille's law for laminar Newtonian flow from a force balance]; *simulate* [a sewage treatment plant for a city, given population demographics and waste emission data from local manufacturing plants].
5. **Synthesis** (creating something, combining elements in novel ways)**:** *design* [an elementary school playground given demographic information about the school and budget constraints]; *make up* [a homework problem involving material covered in class this week].
6. **Evaluation** (choosing from among alternatives): *determine* [which of several versions of an essay is better, and explain your reasoning]; *select* [from among available options for expanding production capacity, and justify your choice].

The six given categories are the cognitive domain levels of *Bloom's Taxonomy of Educational Objectives* (Bloom 1984). The last three categories--synthesis, analysis, and evaluation--are often referred to as the "higher level thinking skills."

Well-formulated instructional objectives can help instructors prepare lecture and assignment schedules and facilitate construction of in-class activities, out-of-class assignments, and tests. Perhaps the greatest benefit comes when the objectives cover all of the content and skills the instructor wishes to teach and they are handed out as study guides prior to examinations. The more explicitly students know what is expected of them, the more likely they will be to meet the expectations.

Use active learning in class

Most students cannot stay focused throughout a lecture. After about 10 minutes their attention begins to drift, first for brief moments and then for longer intervals, and by the end of the lecture they are taking in very little and retaining less. A classroom research study showed that immediately after a lecture students recalled 70% of the information presented in the first ten minutes and only 20% of that from the last ten minutes (McKeachie 1999).

Students' attention can be maintained throughout a class session by periodically giving them something to do. Many different activities can serve this purpose (Bonwell and Eison 1991; Brent and Felder 1992; Felder 1994a; Johnson et al. 1998; Meyers and Jones 1993), of which the most common is the small-group exercise. At some point during a class period, the instructor tells the students to get into groups of two or three and arbitrarily designates a recorder (the second student from the left, the student born closest to the university, any student who has not yet been a recorder that week). When the groups are in place, the instructor asks a question or poses a short problem and instructs the groups to come up with a response, telling them that only the recorder is allowed to write but any team member may be called on to give the response. After a suitable period has elapsed (which may be as short as 30 seconds or as long as 5 minutes—shorter is generally better), the instructor randomly calls on one or more students or teams to present their solutions. Calling on students rather than asking for volunteers is essential. If the students know that someone else will eventually supply the answer, many will not even bother to think about the question.

Active learning exercises may address a variety of objectives. Some examples follow.

- *Recalling prior material*. The students may be given one minute to list as many points as they can recall about the previous lecture or about a specific topic covered in an assigned reading.
- *Responding to questions*. Any questions an instructor would normally ask in class can be directed to groups. In most classes—especially large ones—very few students are willing to volunteer answers to questions, even if they know the answers. When the questions are directed to small groups, most students will attempt to come up with answers and the instructor will get as many responses as he or she wants.
- *Problem solving*. A large problem can always be broken into a series of steps, such as paraphrasing the problem statement, sketching a schematic or flow chart, predicting a solution, writing the relevant equations, solving them or outlining a solution procedure, and checking and/or interpreting the solution. When working through a problem in class, the instructor may complete some steps and ask the student groups to attempt others. The groups should generally be given enough time to think about what they have been asked to do and begin formulating a response but not necessarily enough to reach closure.
- *Explaining written material*. TAPPS (thinking-aloud pair problem solving) is a powerful activity for helping students understand a body of material. The students are put in pairs and given a text passage or a worked-out derivation or problem solution. An arbitrarily designated member of each pair explains each statement or calculation, and the explainer's partner asks for clarification if anything is unclear, giving hints if necessary. After about five minutes, the instructor calls on one or two pairs to summarize their explanations up to a point in the text, and the students reverse roles within their pairs and continue from that point.
- *Analytical, critical, and creative thinking*. The students may be asked to list assumptions, problems,

errors, or ethical dilemmas in a case study or design; explain a technical concept in jargon-free terms; find the logical flaw in an argument; predict the outcome of an experiment or explain an observed outcome in terms of course concepts; or choose from among alternative answers or designs or models or strategies and justify the choice made. The more practice and feedback the students get in the types of thinking the instructor wants them to master, the more likely they are to develop the requisite skills.

- *Generating questions and summarizing.* The students may be given a minute to come up with two good questions about the preceding lecture segment or to summarize the major points in the lecture just concluded.

Use cooperative learning

Cooperative learning (CL) is instruction that involves students working in teams to accomplish an assigned task and produce a final product (e.g., a problem solution, critical analysis, laboratory report, or process or product design), under conditions that include the following elements (Johnson et al. 1998):

1. *Positive interdependence*. Team members are obliged to rely on one another to achieve the goal. If any team members fail to do their part, everyone on the team suffers consequences.

2. *Individual accountability*. All team members are held accountable both for doing their share of the work and for understanding everything in the final product (not just the parts for which they were primarily responsible).

3. *Face-to-face promotive interaction.* Although some of the group work may be done individually, some must be done interactively, with team members providing mutual feedback and guidance, challenging one another, and working toward consensus.

4. *Appropriate use of teamwork skills.* Students are encouraged and helped to develop and exercise leadership, communication, conflict management, and decision-making skills.

5. *Regular self-assessment of team functioning.* Team members set goals, periodically assess how well they are working together, and identify changes they will make to function more effectively in the future.

An extensive body of research confirms the effectiveness of cooperative learning in higher education. Relative to students taught conventionally, cooperatively-taught students tend to exhibit better grades on common tests, greater persistence through graduation, better analytical, creative, and critical thinking skills, deeper understanding of learned material, greater intrinsic motivation to learn and achieve, better relationships with peers, more positive attitudes toward subject areas, lower levels of anxiety and stress, and higher self-esteem (Johnson *et al.* 1998; McKeachie 1999).

Formal cooperative learning is not trivial to implement, and instructors who simply put students to work in teams without addressing the five defining conditions of cooperative learning could be doing more harm than good. In particular, if team projects are carried out under conditions that do not ensure individual accountability, some students will inevitably get credit for work done by their more industrious and responsible teammates. The slackers learn little or nothing in the process, and the students who actually do the work justifiably resent both their teammates and the instructor.

The following guidelines suggest ways to realize the benefits and avoid the pitfalls of cooperative learning (Felder and Brent 1994; Johnson et al. 1998; Millis and Cottell 1998; NISE 1997).

- ***Proceed gradually when using cooperative learning for the first time.*** Cooperative learning imposes a learning curve on both students and instructors. Instructors who have never used it might do well to try a single team project or assignment the first time, gradually increasing the amount of group work in subsequent course offerings as they gain experience and confidence.

- ***Form teams of 3-4 students for out-of-class assignments.*** Teams of two may not generate a sufficient variety of ideas and approaches, teams of five or more are likely to leave at least one student out of the group process.

- ***Instructor-formed teams generally work better than self-selected teams.*** Classroom research studies show that the most effective groups tend to be heterogeneous in ability and homogeneous in interests, with common blocks of time when they can meet outside class. It is also advisable not to allow underrepresented populations (e.g. racial minorities, or women in traditionally male fields like engineering) to be outnumbered in teams, especially during the first two years of college when students are most likely to lose confidence and drop out. When students self-select, these guidelines are often violated. One approach to team formation is to use completely random assignment to form practice teams, and then after the first class examination has been given, form new teams using the given guidelines.

- ***Give more challenging assignments to teams than to individuals*****.** If the students could just as easily complete assignments by themselves, the instructor is not realizing the full educational potential of cooperative learning and the students are likely to resent the additional time burden of having to meet with their groups. The level of challenge should not be raised by simply making the assignments longer, but by including more problems that call upon higher level thinking skills.

- ***Help students learn how to work effectively in teams*****.** Some instructors begin a course with instruction in teamwork skills and team-building exercises, while others prefer to wait for several weeks until the inevitable interpersonal conflicts begin to arise and then provide strategies for dealing with the problems. One technique is to collect anonymous comments about group work, describe one or two common problems in class (the most common one being team members who are not pulling their weight), and have the students brainstorm possible responses and select the best ones.

- ***Take measures to provide positive interdependence*****.** Methods include assigning different roles to group members (e.g. coordinator, checker, recorder, and group process monitor), rotating the roles periodically or for each assignment; providing one set of resources; requiring a single group product; and giving a small bonus on tests to groups in which the team average is above (say) 80%. Another powerful technique is *jigsaw*, in which each team member receives specialized training in one or another subtask of the assignment and must then contribute his or her expertise for the team product to receive top marks.

- ***Impose individual accountability in as many ways as possible*****.** The most common method is to give individual tests. In lecture courses, the course grade should be based primarily on the test results (e.g., 80% for the tests and 20% for team homework), so that students who manage to get a free ride on the homework will still do poorly in the course. Other techniques include calling randomly on individuals to present and explain team results; having each team member rate everyone's contribution and combining the results with the team grade to determine individual assignment grades, and providing a last resort option of firing chronically uncooperative team members.

- ***Require teams to assess their performance regularly*****.** At least two or three times during the semester, teams should be asked to respond to questions like "How well are we meeting our goals and expectations? "What are we doing well?" "What needs improvement?" and "What (if anything) will we do differently next time?"

- ***Do not assign course grades on a curve*****.** If grades are curved, students have little incentive to help teammates and risk lowering their own final grades, while if an absolute grading system is used they have every incentive to help one another. If an instructor unintentionally gives a very difficult or unfair test on which the grades are abnormally low, points may be added to everyone's score or a partial retest may be administered to bring the high mark or the average to a desired level.

- ***Survey the students after the first six weeks of a course.*** As a rule, the few students who dislike group work are quite vocal about it, while the many who see its benefits are quiet. Unless the students are surveyed during the course, the instructor might easily conclude from the complaints that the approach is failing and be tempted to abandon it.

- ***Expect some students to be initially resistant or hostile to cooperative learning.***

This point is crucial. Students sometimes react negatively when asked to work in teams for the first time. Bright students complain about begin held back by their slower teammates; weaker or less assertive students complain about being discounted or ignored in group sessions; and resentments build when some team members fail to pull their weight. Instructors with experience know how to avoid most of the resistance and deal with the rest, but novices may become discouraged and revert to the traditional teacher-centered instructional paradigm, which is a loss both for them and for their students.

Cooperative learning is most likely to succeed if the instructor anticipates and understands student resistance: its origins, the forms it might take, and ways to defuse and eventually overcome it. Felder and Brent (1996) offer suggestions for helping students understand why they are being asked to work in groups and for responding to specific student complaints. These suggestions may not eliminate student resistance completely, but they generally keep it under control long enough for most students to start recognizing the benefits of working in teams.

Assessment and evaluation of teaching quality

Most institutions use only end-of-course student surveys to evaluate teaching quality. While student opinions are important and should be including in any assessment plan, meaningful evaluation of teaching must rely primarily on assessment of learning outcomes. Current trends in assessment reviewed by Ewell (1998) include shifting from standardized tests to performance-based assessments, from teaching-based models to learning-based models of student development, and from assessment as an add-on to more naturalistic approaches embedded in actual instructional delivery. Measures that may be used to obtain an accurate picture of students' content knowledge and skills include tests, performances and exhibitions, project reports, learning logs and journals, metacognitive reflection, observation checklists, graphic organizers, and interviews, and conferences (Burke, 1993).

A particularly effective learning assessment vehicle is the *portfolio*, a set of student products collected over time that provides a picture of the student's growth and development. Panitz (1996) describes how portfolios can be used to assess an individual's progress in a course or over an entire curriculum, to demonstrate specific competencies, or to assess the curriculum. Rogers and Williams (1999) describe a procedure to maintain portfolios on the World Wide Web.

Angelo & Cross (1993) outline a variety of classroom assessment techniques, all of which generate products suitable for inclusion in student portfolios. The devices they suggest include minute papers, concept maps, audiotaped and videotaped protocols (students reporting on their thinking processes as they solve problems), student-generated test questions, classroom opinion polls, course-related self-confidence surveys, interest/knowledge/skills checklists, and reactions to instruction.

Longitudinal study of the proposed instructional methods

In a study carried out at North Carolina State University, a cohort of students took five chemical engineering courses taught by the same instructor in five consecutive semesters. Active learning was used in all class sessions, and the students completed most of their homework assignments in cooperative learning teams. Both academic performance and student attitudes were assessed each semester for both the experimental cohort and a comparison cohort of students who proceeded through the traditionally-taught curriculum. Felder (1995, 1998) gives detailed descriptions of the instructional model and of the assessment procedures and results.

The experimental group entered the chemical engineering curriculum with credentials statistically indistinguishable from those of the comparison group and significantly outperformed the comparison group on a number of measures. Students in the experimental group generally earned higher course grades than comparison group students, even in chemical engineering courses that were not taught by the experimental course instructor. Comparison group students were roughly twice as likely to leave chemical engineering for any reason prior to graduation and almost three times as likely to drop out of college altogether. Anecdotal evidence strongly suggests that the experimental group outperformed the comparison group in developing skills in higher-level thinking, communication, and teamwork.

The attitudes of the two groups of students toward their education differed dramatically. Students in the experimental group gave significantly higher ratings to the quality of their course instruction, the student-friendliness of their academic environment, the level of peer support they enjoyed, and the quality of their investment in their chemical engineering education.

The value of TQM in improving classroom instruction

It is not difficult to find semantic links between teaching and total quality management. Almost every known strategy for teaching effectively cited in standard pedagogical references has counterparts on a list of TQM components compiled by Grandzol and Gershon (1997). Examples include writing instructional objectives (*clarity of vision, strategic planning*); student-centered instruction (*customer focus, empowerment, driving out fear*), collaborative or cooperative learning (*adopting a new philosophy, teamwork*), assessment (*measurement, benchmarks, continuous improvement*), and training and mentoring new faculty members (*human resource development, employee training*).

The question is, if effective teaching strategies are known and validated by extensive research (as they are), why not simply incorporate them into classroom instruction without an added layer of jargon? If all that is done is to choose a subset of TQM terms that map onto known effective teaching strategies and then apply the strategies in a single course—which is what most of the published studies in the education literature consist of—the TQM model adds no value. Perhaps more to the point, TQM is a collective strategy that has meaning only if it is agreed upon and implemented by the staff of an organization. Applying TQM terms to instruction in a single course by a single teacher may provide a good experience for the students, but it is not TQM.

In short, while improving the quality of classroom instruction is a worthwhile goal—arguably the most important goal that a university can adopt—there is no need to force-fit an industrial model or invent questionable analogies (e.g., students as "customers") to achieve it. TQM was developed by identifying problems with existing manufacturing practices and then applying a combination of sound economic and psychological principles to devise a better approach. Improving teaching requires identifying problems with existing academic practices and then applying a combination of sound educational and psychological principles to devise a better approach. Such approaches have already been devised. Why not just use them?

IMPROVING INSTITUTIONALTEACHING PROGRAMS

The proper use of any of the instructional methods described in the preceding section improves the quality of learning that occurs in the classroom. If several of the methods are used in concert, the potential for improvement is all the greater. The quality of an institutional teaching program may therefore be improved by persuading as many faculty members as possible to use those methods in their classes and providing them with the training and support they will need to implement the methods successfully.

It would be nice if we could stop right there, but the problem is more complex. The presumption in everything just said is that both faculty members and administrators at the institution in question generally agree on a definition of "quality of learning" and on the importance of improving it. Unfortunately, this presumption rarely has a basis in fact. Much therefore remains to be said about how to improve an institutional teaching program (as opposed to teaching in a single class), including the potential role of total quality management.

As noted in the introduction, many campuses have experimented with TQM, provoking a great deal of faculty opposition in the process and having relatively little impact on what happens in most classrooms. The conflict between the TQM advocates and opponents reflects differences between the industrial culture where TQM was developed and the culture of the university. The conflict can easily turn what should be a united effort to improve the quality of education into a power struggle between faculty members and administrators. The consequence is that the introduction of TQM to the campus may work against the cause it was intended to promote.

It is not that there is anything wrong with quality management principles. We believe that they are firmly rooted in common sense and that systematically applying them is very likely to lead to improvements in university operations. However, undertaking the wholesale application of a paradigm developed for one culture—industry—to another culture—higher education—has pitfalls. In important ways, the two cultures are as different as automobiles are from students, and steps that may be feasible in one environment may be entirely inappropriate in the other. [Beaver(1994) makes this point tellingly. Some of the ideas we present in the next section draw on his observations.] Perhaps more to the point, the rhetoric of total quality management contains terms that are offensive to many faculty members, and their resentment of attempts to apply TQM language to their profession provokes fierce opposition to TQM-based strategies.

In the remainder of this section we review the cultural differences that give rise to the faculty opposition, and then suggest how the lessons of TQM may be applied to teaching program improvement in a manner much more likely to succeed.

Two different worlds

Every organization, be it a company, a corporate division, a university, a college, or an academic department, has both a *stated mission*, which is written for public consumption, and a *true mission*, which dictates how the organization allocates resources and rewards performance. The two missions may be the same or different. The working definition of "quality" within an organization is determined primarily by the organization's true mission. The concept of the true mission is needed to explain the principal differences between the industrial and academic cultures that are related to quality management.

- *In industry, the true mission is relatively clear, and quality is relatively straightforward to define. In education, the true mission is complex and subject to endless debate, and quality is therefore almost impossible to define in an operationally useful manner.*

Whatever the corporate mission statement may say, the true mission of a for-profit company is to maximize profits (more precisely, some measure of profitability). Setting aside altruistic objectives that may motivate individual company personnel, such goals as zero defects, customer satisfaction, staff empowerment, etc., are to the corporate mind simply means to the end of maximizing profits. "Quality" may be defined as any property of an industrial process or product that varies in a generally monotonic manner with profits. The goal of raising quality is therefore consistent with the mission of maximizing profits.

In education as in industry, the stated mission and the true mission may not coincide. The similarity ends there, however. The goals that constitute the educational mission of a university are extremely hard to pin down to everyone's satisfaction. Is the goal to produce graduates who simply know a lot more than they did when they enrolled as freshmen? What is it that we want them to know? Do we wish to equip the students with the skills they will need to succeed as professionals? What skills would those be? Are they the same for all professions? Are we trying to produce "educated citizens"? Whose definition of "educated" will we adopt? Plato's? Dewey's? Alan Bloom's? Is it our purpose to promote certain values in our graduates? Which ones?

Agreeing on educational goals is only the first step toward formulating an academic mission, however. In the modern university, teaching is just one of several important functions, the others being research, service to business and technology (e.g., through faculty consulting activities), and service to the community and society at large. The true mission of the university might involve maximizing research expenditures, tuition revenues, "productivity" (rate of production of graduates divided by faculty size), the institution's ranking in *U.S. News and World Report*, national rankings of the football and basketball teams, and regional and national reputations of the undergraduate and graduate teaching programs. Many of these goals are unrelated and most of them compete for limited resources. Prioritizing them to arrive at a realistic teaching quality improvement program is a challenge unlike anything encountered in industry.

- *In industry, quality is relatively easy to assess. In education, even if a definition of quality can be formulated and agreed upon, devising a meaningful assessment process is a monumental task.*

Quality control managers can easily count the number of television sets in a production run that malfunction, or the percentage of silicon dioxide films deposited on semiconductor wafers that fall outside pre-specified quality control limits, or the weekly volume of complaints about the promptness and effectiveness of repair service calls. The lower those values, the higher the quality of the process being assessed.

But what are the measures of quality in education? Assuming that the mission of a university includes the imparting of certain knowledge, skills, and (perhaps) values, a meaningful assessment process must include measuring the degree to which the students have acquired those attributes. Assessing knowledge is relatively straightforward, but methods for assessing skills are complex and time-consuming to administer and valid means of assessing values do not exist.

- *In industry, the customer is relatively easy to identify and is always right, at least in principle. In education, those who might be identified as "customers" have contradictory needs and desires and may very well be completely wrong.*

When attempt is made to introduce TQM on a campus, the term "customer" probably provokes more faculty outrage than any other feature of the approach. Its use is taken as clear evidence that the proponents of the program do not understand the differences between an industrial organization and an educational institution.

This inference is understandable. If I manufacture automobiles, the customers are automobile buyers. If I produce semiconductor chips, the customers are the manufacturers of the products that use semiconductor chips. If I own a restaurant, the customers are the diners. If a significant number of my customers complain, it means that I am not doing an acceptable job, and unless I improve in a way that reduces the number of complaints, I will suffer negative consequences. Admittedly, the shareholders and/or the Board of Directors might also be considered my customers, but if the first group of customers is unhappy and I am operating in a competitive market, the second group will sooner or later also be unhappy.

If I am a faculty member, my "customers"—who include hirers of graduates, university administrators, governing boards, state legislatures, research funding agencies, parents, and students—want different and frequently contradictory things. Industry wants graduates who have good technical, communication, and teamwork skills and who can think critically and solve problems creatively. Administrators and governing boards want the university to have high national rankings (which are invariably based on research reputations), large amounts of external funding, and high "productivity," turning out as many graduates in as short a period of time as possible and at the lowest possible cost. Legislatures want the universities to be responsive to the taxpayers' needs, which usually means having a strong but affordable undergraduate program. Funding agencies want results obtained quickly and cost-effectively. Parents want low tuition and graduation in four years or less. And then there are the students.

Students at a university want a bewildering variety of different and often contradictory things. Some want teaching that emphasizes the concrete and practical over the abstract and theoretical that will prepare them for their chosen professions; others want a rigorous education that will prepare them to enter top graduate schools and then go on to research careers. Most dislike difficult homework assignments and examinations; a few welcome the challenge. Some like working in teams; others hate it. And so on.

In short, the "customers" of a university clearly cannot always be right, and they may sometimes be completely wrong. The goal of customer satisfaction that makes so much sense in a corporate environment consequently makes little sense at a university. It is little wonder that faculty members react negatively to the concept.

- *In industry, a clear chain of command usually exists, on paper and in fact. In education, a chain of command might exist on paper, but it is in fact relatively amorphous and nothing at all like its industrial counterpart.*

Corporate executives who wish their subordinates to do things differently have both carrots and sticks at their disposal. Employees who make substantial contributions to meeting the goals of the company or of their superiors may be awarded bonuses, raises, and promotions. Those who fail to make such contributions may (leaving aside considerations related to unions) find themselves unemployed or relegated to undesirable positions as a consequence of their insubordination. For both of these reasons, if the CEO or the Board of Directors of a company decides that (for example) a TQM policy will be implemented, the policy is implemented, and staff members who fail to go along with it place themselves at risk.

Insubordination is not part of the normal vocabulary of administration-faculty relations. Administrators may make requests but they simply do not give orders to professors, and they have very little power to compel acceptance of their requests. They may award or deny merit raises to noncompliant faculty members but there is not much else they can do, especially if the faculty members are tenured. (Tenure has no counterpart in industry.) If they ask professors to do something that requires a substantial expenditure of time and/or effort—such as undertaking a quality-based teaching improvement program—they must somehow make a convincing case that doing it is in the professors' best interests. Considering the low priority of teaching in most academic reward systems, that case can be extremely difficulty to make.

Toward an effective institutional teaching improvement program

We have so far spoken only of changes in teaching methods, but improvements in instructional programs may also involve subject integration, just-in-time instruction, writing across the curriculum, or any of a variety of other non-traditional approaches that have been found to improve learning. In the final analysis, however, the quality of a teaching program is primarily related to the quality of the instruction that takes place in individual classrooms. For the new curricula and instructional methods to have the desired impact, a reasonable percentage of the faculty must participate willingly and competently in both their delivery and their assessment. If they do not, the curriculum structure and any other educational reforms will be largely irrelevant in the long run.

Most faculties have enough members who are sufficiently dedicated to teaching to participate voluntarily in pilot studies of new instructional programs, with minimal expectation of tangible reward. As many administrators have recently discovered, however, attracting and keeping enough faculty volunteers for a full-scale implementation of a new teaching program can be difficult or impossible, particularly if their participation is an add-on to all their other responsibilities and does not count toward tenure and promotion.

Administrators who wish to make major improvements in the quality of their teaching programs should therefore provide incentives for faculty members to participate in the new programs, such as salary supplements, travel or equipment funds, or release from service responsibilities. They should also commit to faculty members who carry the principal burden of teaching and assessment in the new programs that they will have the same opportunities for tenure, promotion, and merit raises as their more research-oriented colleagues now enjoy (Boyer 1990; Glassick et al. 1997; Felder 1994b). Unless this commitment is made and honored, attempts to implement a large-scale teaching improvement program are likely to consume an immense amount of time and effort and accomplish relatively little in the end.

Here, then, is our view of what can be done to improve the instructional program at a university. Each step requires agreement of the faculty members who must implement it and the administrators who must provide the necessary resources.

1. Faculty members and administrators define the knowledge, skills, and values that the graduates of the program should have.

2. With the assistance of experts in pedagogy and learning assessment, the faculty defines the instructional methods most likely to lead to the acquisition of the desired attributes, selects the methods needed to assess the effectiveness of the instruction, and estimates the resources (including provisions for faculty development) needed to implement both the instruction and the assessment.

3. The administration commits to provide both the necessary resources to initiate and sustain the program and appropriate incentives for faculty members to participate.

4. The faculty and administration formulate a detailed implementation plan.

5. The faculty implements the plan.

6. The faculty and administration assess the results and modify the plan as necessary to move closer to the desired outcomes.

Rogers and Sando (1996) present models for teaching program assessment that include recommendations for all but Step 3 of this list.

This six-step plan sounds like a TQM model, and of course it is. It can be put into effect perfectly well, however, in the context of the university culture, without ever mentioning customers, empowerment, bottom-up management, or any other TQM term whose applicability to education is questionable. Consensus on all of the issues involved in educational reform might or might not be achieved, but at least the dialogue would focus on the real issues rather than semantic red herrings.

Our recommendations for improving teaching quality finally come down to this. Instructors who wish to improve teaching in a course should consult the literature, see which instructional methods have been shown to work, and implement those with which they feel most comfortable. Total quality management need not enter the picture at all. An administration wishing to improve the quality of its instructional program should first make the necessary commitment to provide the necessary resources and incentives for faculty participation. Then, don’t talk about TQM—just do it.

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