

A View from Both Sides of the Podium

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Abstract

On one side of the podium is 23 years of teaching graduate engineering management and undergraduate engineering. On the other side is a recently completed second master's degree. I found that what I thought important as a professor was not necessarily what the students valued. I also had the opportunity to interact with my professors with suggestions on how to improve results or make their lives easier.

Introduction

One view comes from 23 years of teaching. This has principally been in the graduate engineering management program at the University of Alaska Anchorage where there were also some undergraduate engineering responsibilities. Teaching sabbaticals have been spent at the University of Missouri-Rolla and the Naval Postgraduate School. The other view comes from recently completing a second master's degree as a full-time continuing education student. This was a master of civil engineering degree, but it did include some senior level baccalaureate courses. Both views are supplemented by nearly 20 years of ASEE conferences.

I had served on the faculty with each professor (except one adjunct), and I had served on peer review committees for tenure, promotion, and evaluation. Yet, the student grapevine was an eye opener. Vague rumors became substantiated facts. More importantly, student comments made it clear that their values were diverse and different from what I expected. In some cases students seemed to hope that I would function as an anonymous conduit for their concerns. This interaction had as a foundation my past relationship with about 25 undergraduate and graduate students that I had had in my own classes. These students became far more open with me when I was a student with them.

As a student who had been a professor, I was watching and evaluating each lecture, assignment, and exam. Some professors solicited suggestions, and others limited how many they were willing to hear. There was neither a positive nor a negative correlation of willingness to hear and my perceived need for suggestion. This interaction was far different than that of a senior professor offering advice to a junior colleague. I was a student in their classes and heavily affected by their teaching style.

This paper comments on pedagogy, learning styles, course structure, successfully communicating with students, and course practices. It is structured according to meeting the expectations of your students, your colleagues and supervisors, and your self. Table 1 summarizes the structure and the results of the paper. The text is anecdotal with a focus on advice. The focus is on classroom performance, since that is what most students see. Office

Table 1. Summary of expectations

Student Expectations

- Knowledge, organizing and prioritizing topics, designing course
- Enthusiasm
- Respect for other demands – families, courses, jobs
- Technology use – blackboards, overheads, PowerPoint, web/internet, engineering software
- Prepare them for grading “opportunities,” other courses, FE, and the real world
- Real world – topics covered, testing methods, insights about

Colleague and Supervisor Expectations

- Prerequisite knowledge
- Reasonable workload
- Grading standards
- Balance innovation and conformity

Your Expectations

- Productive = effective & efficient
- Fun
- Improving

hours, after-class advising, and other forms of availability are what matters here. In contrast, research, publications, and university committees largely do not matter.

Student Expectations

Knowledge does matter. Subject mastery by the instructor is expected and assumed (unless the student grapevine says a particular instructor is not competent in one or more courses). This is best demonstrated by clear explanations and by limited additions to material in the text, such as real world examples from personal experience. As an engineering student, I expect to apply what I learn. Thus, I value a real world applied focus for the instructor’s knowledge, prioritization of topics, and expectations of me.

Usually I dislike any deviations from the text, and they only become acceptable if very complete material (copies of transparencies or Powerpoint slides) are distributed. You (the instructor) should assume that I (the student) may miss class, have difficulty following the material, or simply let my attention wander. Is it realistic to expect me to understand and transcribe 50 minutes to 3 hours of engineering or engineering management material?

As a student, I am not conversant with learning styles nor the advantages and disadvantages of different teaching techniques. However, I can and do recognize when artificial or “academic” standards are applied, rather than standards linked to the practice of engineering. For example, this includes exams based on memory vs. using the text and my notes. I also recognize when the

instructor's needs are given priority over my and my classmates' needs, such as when homework is neither assigned nor collected. I can tell if a course has been designed so that I can develop and demonstrate my understanding.

While the student's focus is on outcomes – developed and demonstrated understanding, the faculty member's tool is pedagogy. What will the homework, labs, case studies, exams, quizzes, lectures, team assignments, projects, etc. accomplish – individually and collectively?

Is the instructor fair and reasonable? For many engineering courses this is primarily a workload question. And far too many engineering instructors seem to fail this standard. This is judged differently for core, required, and elective classes. Notice my student definition of core means I will use it in my career – soon after graduation. Required means that the academic program believes I must study this, but I don't expect to use it. Elective means that I have some choice in the matter. Demanding instructors are given more latitude if they are clearly working as hard at the teaching as they are expecting the students to work.

An easy test of how demanding you or your colleagues are is to propose dropping an assignment. If everyone breathes a sigh of relief and no one is concerned about whether their understanding will be impaired, then you or another instructor is asking too much. Potentially, program advising is encouraging students to take more courses than other responsibilities will really permit. Unfortunately, higher education seems to be a service where the customer is happiest when they do not get everything they paid for.

What gets graded gets done! (Obvious translation of what gets rewarded gets done from management theory.) If homework isn't important enough to be collected and graded (in some fashion), then I'll try to get to it, but graded work from my other classes comes first.

I may not know why class or office hours are being cancelled, but the student grapevine can be surprisingly accurate at considering consulting, research, personal travel, illness, and plain laziness. Remember that all students, and especially part-time students, expect that more lenient

Table 2. Positives and negatives

Positives

- Faculty who try to teach well in spite of incentives to focus elsewhere
- Teamwork that seems to involve most students in study groups
- Mutual respect is common among students and faculty
- Enthusiasm of most faculty for their courses
- Faculty that were available to all students not just to an emeritus professor

Negatives

- Number of closed book exams that relied on memorization over understanding
- Engineering labs that were extremely inefficient learning opportunities
- Number of assignments where the time required was disproportionate to the learning
- Poor use of software to develop engineering intuition
- Number of students emphasizing graduating ASAP vs. learning
- Fragmentation of courses with little integration

rules be applied to them than the professor applies to himself or herself.

Colleague and Supervisor Expectations

Far too often the main concern of colleagues and supervisors is that you don't cause problems for other faculty. Generally the worry is that sub-standard efforts will leave students unprepared or that lax standards will not weed out enough students. Less often the concern is over super-standard performance that raises student expectations for faculty performance.

Unfortunately it seems that involvement with ASEE is one way to create negative expectations among far too many colleagues and supervisors. The focus is supposed to be research not teaching. In their eyes, a young faculty member cannot be seen to spend too much time on teaching.

These negative expectations will be exacerbated if a faculty member

- advocates innovations in teaching
- tries to link course material over courses taught by different faculty
- focuses on what a student needs to know to practice engineering.

Fortunately, most faculty value good teaching, but they feel constrained by institutional pressures so that it may not be their highest priority. They may question your priorities when you focus on teaching, but they appreciate having better prepared students in their courses.

Your Expectations

To quote from a Cat Stevens song, "You can't please everybody, so you have to please yourself." If you are here at ASEE, you have demonstrated a higher than average commitment to teaching. Most engineering colleges contain senior and junior faculty who care intensely about teaching. You just have to become part of that network. ASEE is a very efficient way to become a better teacher.

You have to achieve a dynamic balance of your personal life and of the professional triad – teaching, research, and service. I recommend an annual plan with specific measures or goals for each area. Life as a faculty member has too many unexpected opportunities for this plan to survive a year unchanged, but having a plan is the best way to ensure that you meet your own expectations.

In many jobs the tasks are determined by a supervisor. However, for faculty most tasks are self-appointed. This means knowing when to say "yes" or "no" is crucial – otherwise you cannot maintain control of how your plan evolves. That control does allow you to ensure that your job is fun, that you do better each year, and that you are both efficient and effective.

Conclusions

As a student who had been a professor, I chose teachers who were knowledgeable and who were working hard to do a good job. Usually their weaknesses were ones of inexperience. However,

it was very clear that several faculty knew little of learning styles and had studied teaching in only a limited way. Given the pressures on engineering faculty to do research, development in this area will clearly take concerted efforts by deans and department chairs.

It was also clear that all students view some courses as boxes to be checked off en route to a degree, and some students view all courses that way. The fraction of each is much higher than I perceived when I was a faculty member. Countering this attitude requires enthusiastic faculty with the time and commitment to work hard at teaching. Fortunately, I was blessed with such faculty.

The most depressing conclusion is that engineering education seems to be made unattractive to the students in far too many cases. Rather than trying to attract and interest bright capable students, far too often it is focused on winnowing down the entering class. Subjects are often presented independently and as theoretical bodies of knowledge separated from how students will apply them. Students are struggling to survive each academic term with extremely heavy course demands. Faculty are denied the tools and the time to really excel at teaching.

Biographical Information

Dr. Ted Eschenbach, P.E. is an emeritus professor of engineering management of the University of Alaska Anchorage. He earned his Ph.D. in IE in 1975 from Stanford and graduated with an MCE degree in May 1999 from UAA. He has served as Faculty Senate President at UAA and as the Kopljar Professor of Engineering Management at the University of Missouri-Rolla. He is the founding and current editor of the *Engineering Management Journal*, a frequent attendee and presenter at ASEE conferences, and the author or coauthor of 3 engineering economy texts.