Assessment in Academia: the Good, the Bad and the Ugly

*Paul Kelter**

Abstract

The use of assessment tools in academia is increasing at a torrid pace. The most important factor in this stunning increase in assessment is the desire for accountability during difficult economic times. In particular: administrators need to prove to a skeptical public that tax dollars are being spent wisely; individual department faculty need to justify their own budgets; employers want to know that the graduates they hire have the content, thinking and "people skills" that are required by corporations; and federal, state and private granting organizations want to know that their grant money is being put to good use. This paper will discuss the audiences for assessment and the types of tools that are now a normal part of our faculty responsibilities in the United States. The special focuses will be on considering how we distinguish good teaching from bad teaching, what U.S. universities are doing, and can do, to deal with bad teachers, and how I deal with these issues in my own classroom.

Narrative

There are those who differentiate between "evaluation" and "assessment". I define **evaluation** as *a process of data collection to determine the worth of a program (current value)*, and **assessment** as *the collection of data in order to determine how to improve a program (looking toward the future)*. In this paper, I will take a broader view, and define the single term "assessment" as *the process by which we determine if our program goals and objectives have been met, and how we might change our program to better meet these goals and objectives* (current value *PLUS* looking toward the future).

We make decisions about the success of our programs based on the assessment process, and, as such, assessment is a vital part of any organization, whether industrial, governmental or academic. In the discussion that follows, I will outline the many forms of assessment that faculty contend with in the U.S. I use the words "contend with" intentionally, to show that although assessment is inherently useful as a tool to improve programs, it is also often **adversarial**, pitting opponents against each other, as in a boxing match or soccer game. The agenda of assessment now often pits students against faculty, faculty against each other, faculty against administrators, and universities against the tax-paying public. At its heart, the assessment process should be about improvement–how we can become more effective at doing our jobs, so that our students can learn more better. But because of political, economic and social pressures (some valid, others not), assessment is in danger of becoming a huge elephant on the academic landscape, using its sheer weight to crush whatever educational gain lies in its path. The amount of assessment that must now be done by all levels in the typical U.S. university is startling. Assessment requirements are now so vast that they take precious time away from our ability to interact with students and do the other business of academia. As we look at the types of assessment that are now required in U.S. institutions of higher education, we must ask ourselves, "with so much time spent on assessment, will we eventually not have adequate time to continue the programs that we are asked to assess?"

The Scope of Assessment in Academia

In the U.S., academic assessment falls into several major categories:

1. Students assess faculty;
2. Students assess each other;
3. Faculty assess students;
4. Faculty assess other faculty;
5. Faculty assess entire curricula;
6. Faculty assess enrollment levels;
7. Faculty assess administrators;
8. External evaluators assess faculty grant outcomes;
9. External evaluators assess entire universities;
10. Administrators assess faculty (tenure and promotion);
11. Administrators assess departments (enrollment trends, as places to cut budgets);
12. State legislatures evaluate universities.

I will discuss each of these 12 assessment categories below. Yet if our focus is on the students, then it is appropriate that we spend the most time considering the assessment of how we distinguish good teaching from bad teaching, and what U.S. universities are doing, and can do, to deal with bad teachers. We will discuss this vital concern in the last part of this paper.

1. Students assess faculty. The standard procedure for this is an end-of-semester questionnaire in which students

*Department of Chemistry, University of Illinois at Urbana-Champaign, Urbana, IL 61801, USA.
E-mail: paulkelter@yahoo.com

assess certain qualities of a teacher that are judged to be important by the faculty member's home department. This often includes: an exciting lecture style; availability after class (office hours, e-mail); the fairness of exams; and the fairness of grading. Some chemistry departments include questions about the teacher's sense of humor, organization, chalkboard work, etc. The student ratings are quantitated for each question, and are then combined in the ratings a bottom-line question, "Overall, how do you rate your teacher". A final cumulative score is determined, typically on a 0 = poor, 4 = excellent scale. Additional questions concern the course ("good, bad, or indifferent"). Finally, many assessment forms have room for open-ended discussions. Example student evaluation forms are available at several sites.[1, 2]

What is done with these quantitative and qualitative results? There are two stated goals for this type of assessment. The first is to indicate to the teacher how he or she is perceived by the students. This includes feedback on strengths and weaknesses in teaching style, grading policies, and so forth. The thinking is that if the instructor understands where his or her weaknesses are, then he or she can become a better teacher. The second stated purpose is for the departmental leadership to know how the teacher is perceived by the students. This is primarily used when the professor is being evaluated for salary increases, tenure and promotion decisions. In my 23 years as a professor at several types of colleges and universities, *I have nearly never seen a tenured professor spend a significant amount of time looking at student evaluations as a means of improving his or her teaching.* Why not? Those who are bad teachers don't believe that their students are sufficiently skilled to make such assessments. The good teachers get told the same good things year after year, and they are motivated to improve their teaching on a continual basis, with or without the once-per-semester student evaluation forms. In many chemistry departments, the student comments that accompany the quantitative ratings are kept well-hidden from the faculty themselves for reasons I have yet to understand.

The truth is that end-of-semester student evaluations are nearly meaningless tools for improving teaching. If student feedback were viewed as truly important, "formative" (during the course) assessments would occur, so that the students who are currently being taught could benefit from instructional changes. The truth is that at small and mid-sized universities, student assessment of teaching is primarily about tenure, promotion and salary increases for faculty. Tenure and promotion committees "look at the numbers" –the quantitative summary of the students' teacher ratings– and hire, fire, promote and financially enrich or deprive on that basis. At large, research-based universities, the process is largely irrelevant. Teaching simply isn't important, no matter what the universities publicly claim.

2. Students assess each other. Student assessment of the work of other students is often known as "peer assessment". This relatively recent instructional assessment is related to an increasing national trend encouraging "writing across the curriculum". It is clear that far too many first-year students simply cannot write properly. Their ability to organize thoughts and express those ideas using basic rules of grammar is sadly lacking. What can we do in order to remediate this critical shortcoming? We can have students write chemistry-related essays, lab reports and such, but then we have to grade what they write. That takes time–a lot of time. And it takes a level of expertise that chemistry faculty often don't have. We are chemistry professors–not English professors. Yet there are initiatives designed to increase the amount of chemistry writing done by first-year students. Are they becoming better writers as a result? The answer is not clear.

One representative program is called "Calibrated Peer Review", or CPR, and was originated in the Chemistry Department at UCLA. Quoting from the CPR Website, "Calibrated Peer Review (CPR) is a Web-based program that enables frequent writing assignments even in large classes with limited instructional resources".[3] Students in CPR-based chemistry sections write essays related to course topics, and have their work reviewed by other students ("peers") who have been "calibrated" to identify the tools of proper writing. In this way, CPR allows students to do the evaluative work that instructors would normally do. I was the external evaluator on a CPR project in Nebraska, in which students assessed each other's laboratory reports. The results were less than promising, because students did not like the idea of other students (rather than professors) grading their work. Professors are accountable for their expertise in assessment, and students are not professors. This is the key factor when considering peer assessment–should students ("peers") be permitted to grade papers that count toward a student's end-of-semester grade? I do not think so.

3. Faculty assess students. There is no one agreed-upon way that faculty assess student understanding. Many universities use multiple-choice examinations, given 3 or 4 times per semester, with each test covering a couple of major topics. A cumulative final examination, typically worth between 20 and 30 percent of the total grade, is also given. The Examinations Institute of the American Chemical Society, currently under the leadership of Tom Holme at the University of Wisconsin-Milwaukee, designs and markets "standardized" tests of all kinds.[4] I give "partial-credit" multiple-

choice exams, in which the correct answer is worth full credit, and slight errors (such as inverting a conversion factor) lead to answers that, while incorrect, get partial credit. At large universities, a good deal of assessment error is introduced by having graduate teaching assistants grade papers. Multiple-choice exams eliminate this vital source of error, as well as any other errors associated with liking or disliking students or other prejudices that might subtly creep into the assessment process. Many schools have "on-line" quizzing programs that students take at nearly any time within a certain time frame, typically a week. The on-line quizzes are an excellent way to review for exams, and individualized tests can be generated via the computer program. Concerns include how to guarantee that students don't have help when taking the quizzes. Cooperative assignments are occasionally given. With all the research done about how to be more effective teachers and learners, the assessment methodology in U.S. colleges and universities is still remarkably "traditional". I think this is a good thing. I will go into considerable detail about my teaching style and assessment methods in the penultimate section of this paper.

4. Faculty assess other faculty. Faculty peer assessment is largely concerned with tenure and promotion. It is standard for chemistry departments to have older, more experienced faculty sit in on lectures of younger faculty at least once each year to determine if they are teaching well. The key questions are, "What does 'teaching well' mean?", and, "Can we judge if someone is a good teacher by visiting only one lecture per year?" I will consider the first question in a separate section, later on. The answer to the second question is, "No, we cannot distinguish good from bad teaching by sitting in on only one lecture per year." Just as we would not report the results of an analytical determination by making only one measurement, we need to make multiple measurements of a faculty member's teaching skill. More significantly, if we expand our sense of purpose to recognize our goal as actually *improving the teaching of our young faculty*—that is, *mentoring them*, then we must visit their classroom often, and discuss how their teaching can be made most effective. Among the most serious lapses in our work with our young colleagues is our unwillingness to invest in their growth as teachers.

5. Faculty assess entire curricula. This is an interesting, important, and too often ignored area of assessment. Chemistry departments are so often compartmentalized into specific divisions—analytical, physical, and so forth—that we typically don't look at the undergraduate curriculum as a whole entity with a structure that profoundly affects the education of many different groups of students. Chemistry majors make up a very small portion of our total student population, yet we invest so much of our courses and faculty on these relatively few students. The first and second-year courses have large lecture sections where students are taught in the largest possible groups because this is the most economically beneficial way to "educate". Questions arise even within these large classes. What drives the content? Most often, it is the textbook. Is the content meaningful? Do students learn the chemistry principles that have the most meaning to them? Is the large lecture section the best we can do, or are there other, more meaningful alternatives? What is the impact of computers and the Internet on our ability to help students learn the core ideas of chemistry? How should we incorporate relatively new topics, such as forensic chemistry and biotechnology, into the curriculum? These are all questions that each chemistry department must consider if it is to have the maximum impact on students. And this curriculum assessment must be on-going process.

6. Faculty assess enrollment levels. Economics plays such an important part in the decisions made by U.S. chemistry departments. This makes sense, because money allows more faculty, more courses and more research. More students enrolled means more money being generated by the department. So a critical goal is to keep enrollment high, and growing. The best strategies include: having your best classroom teachers teach the first-year courses, generating majors and interest across campus; and maintaining popular liberal arts chemistry courses for non-science majors, because these are generally high-enrollment, low-cost courses. Other strategies include: assigning your worst teachers to senior-level courses, so that students discover these awful teachers after it is too late to change their majors; having excellent student advising; and most important, creating a sense of goodwill and warmth in the department. Departments that care about students have a decided edge in enticing students to become majors.

7. Faculty assess administrators. This is generally the most meaningless type of evaluation, because the most senior levels of administration (Chancellor and Provost) typically don't really care what the faculty think about other administrators. Such assessment is, generally, a waste of faculty time.

8. External evaluators assess faculty grant outcomes. The ability to obtain grant funding is a vital step in getting tenure and promotion at most U.S. colleges and universities. While there is no specific dollar amount that is required, and so many other factors are a part of the 6th-year tenure and promotion decision, it is fair to give the following broad parameters. In a bachelor's degree-granting chemistry department, a total of $100,000 over the 6-year probationary period is usually suitable. In a department that awards

master's degrees, between $100,000 and $200,000 in external funding is expected. In a Ph.D.-granting department, more than $500,000 is expected, though $1 million is preferred in the top-rated institutions.

Granting agencies, such as the National Science Foundation, expect good science in return for their investment. For chemical education specialists, the funding agencies expect significant educational improvements to occur as a result of the funding. It is therefore common to have a grant budget that includes 10-15% of the total funding for an independent assessment (it is worth noting, rather cynically, that most "independent" assessment is not especially independent, because the assessor is often a friend of, or collaborator with, the project leader. Nonetheless, the assessment mechanism must be in place).

9. External evaluators assess entire universities (accreditation): Accrediting agencies are charged with making programs meet prescribed regional or national standards. The American Chemical Society has a full accreditation service which visits departments, giving competent ones that have the required faculty expertise and course offerings its "ACS certification". Graduating bachelor's degree students can qualify for an "ACS-certified" diploma.[5, 6] Universities are accredited based on the overall quality of their programs by organizations such as the Southeast Association of Colleges and Schools (SACS).[7] Such certifications are highly sought after, and there can be rather draconian institutional penalties for a higher educational institution in the Southeastern U.S. not being SACS-certified. Faculty spend an inordinate amount of time dealing with so-called: "unfunded mandates"–the processing of endless stacks of paperwork for required ("mandated") non-educational work, such as external certification. These are "unfunded" because we get no extra money or time to deal with these things. They represent added work that is not helpful to our students. Such unfunded assessment mandates are among the fastest growing time commitments we have. And they are among the most wasteful.

10. Administrators assess faculty (tenure and promotion). This is the most significant area of assessment for young faculty, because there are only two alternatives with the tenure decision, permanent employment or permanent dismissal. The criteria for tenure vary among colleges and universities. Significant research funding (discussed in point #8) is a common factor. Although good teaching is expected, it is far more important at bachelor's degree-granting institutions, and essentially irrelevant at Ph.D.–granting universities, which have a different focus. Young faculty are evaluated annually by the department Head for salary increases, as well as to assess progress toward tenure and promotion. During his or her 6th-year, the faculty member applies for tenure, and his or her credentials are evaluated by a faculty committee, a Dean, the Provost and, finally, the Chancellor. The Chancellor's decision is binding for both tenure and promotion. It is not unusual for Chancellors to overrule the recommendations by the tenure committee or other administrators. The tenure and promotion policies for the University of North Carolina-Greensboro (which primarily focuses on bachelor's and master's degrees) and the University of Illinois at Urbana-Champaign (a major Ph.D.—granting institution) are available.[8, 9]

11. Administrators assess departments. The U.S. is in one of its most severe budget crises in decades. Because of traumatic cuts in federal spending (except on national "defense", which has been flooded with money), education and other types of funds that would normally go to individual states have been significantly reduced. Add to this a sharp reduction in state tax revenue caused by large job losses and the lowering of income tax rates when times were good, and the states are in desperately poor financial condition. This has resulted in the slashing of funds to higher education. In Illinois, the budget for the state university system has been reduced 8% in 2002 and 2003. Faculty and staff did not had a raise in those two years. In Nebraska, the cuts amount to 10%, and tenured faculty were being fired. Even "elite" colleges, such as William and Mary in Virginia, whose faculty went several years without pay raises, are not immune to the budget crunch. One way to save money is to merge two or more departments into one. An example of this is at the University of Nebraska-Kearney, a relatively small campus with an enrollment of about 6,400 students, where the administration has chosen to combine the chemistry and physics departments into one, resulting in the firing of several secretarial and other clerical workers.

In today's most difficult economic climate, administrators cut funds and/or positions from departments who do not "produce". In the worst cases, entire departments are eliminated. What is the measure of production? Faculty grant funding and student enrollment are the keys. Healthy departments have both. From the standpoint of chemical educators, our key role has to be curricular. How can we create and teach the courses that will get lots of students into the department? And once we get them into the courses, how can we convince more of them to stay (as majors)? This is our key challenge. It is a matter of survival for our discipline.

12. State legislatures evaluate universities. This assessment discussion has been as much about economics as about helping students learn chemistry! However, the impact of money on our educational system is unquestionable, because of the things that money makes possible, along with the consequences when money is not available. Therefore, we must recognize the political nature of our jobs, because

state legislatures decide how much financial support public colleges and universities get each year. State legislatures want "public accountability". This means that they want the people who vote for them to say that their tax dollars are being well-spent. This means that state legislatures have put in place minimum teaching requirements for faculty. In the state of North Carolina, this is 7.5 classroom (or laboratory) hours per week, though most campuses prefer 9-12 classroom hours per week. In fact, most campuses that grant master's and doctoral degrees make creative use of teaching assistants to reduce this number to 3-6 hours per week. As a general rule, then, accountability, and, therefore, continued funding, means continued focus on teaching.

Distinguishing Good From Bad Teaching

We have seen that assessment plays many roles in higher education. Some of these roles are important to the intellectual development of students, and some are more pragmatic. We want to convince students to enroll in our courses. And once we get them into the classroom, how can we convince more of them to stay (as majors)? This is our key challenge. It is a matter of survival. My experience as a U.S. university professor has taught me that although I find chemistry to be an inherently interesting subject, the subject matter itself is not the key. *The key factor in getting new chemistry majors is the ability of the teacher to show his or her love of the subject and the students.* It's that simple. We must enjoy both the science and the students. Then many of the students will become lifetime chemists.

How then, do we distinguish those who can transmit their enjoyment of the subject and the students from those who do not? There are some characteristics that great teachers have in common. Great teachers know their subject. Great teachers present material with passion. Great teachers expect great things from their students, and are disappointed if they don't achieve competence. Great teachers are interactive–they ask a lot of questions during class because they care what their students understand. Great teachers evaluate their students' understanding using fair and appropriate assessment procedures (tests, problem sets, etc.). These are just some of the things that great teachers do.

Bad teachers talk **at**, rather than **with** their students. Bad teachers are unorganized. Bad teachers don't know the content. Bad teachers give exams and other assessments that do not represent the material or are of inappropriate level. Bad teachers try to be unavailable outside of class. There are other characteristics, but they all boil down to a lack of care.

Can students properly differentiate good from bad teaching? Yes. Students know when the teacher cares about them. They know if the teacher wants them involved in learning. They know if the teacher is available during office hours and on e-mail. In short, they know all the things that a conventional external faculty reviewer can't know, because faculty reviews don't normally consider the day-to-day culture of the class.

What does this mean about how chemistry departments can more accurately distinguish good from bad teaching? We need to have department policy that does the following:

1. We need to have students write several **formative** (that is, **during** the semester) evaluations of their professors. Their assessments should be read by the department Head as well as a supportive group of faculty mentors within the department.
2. We need to interview our students during the semester to find out the best things about the faculty member's teaching, as well as things that could use improvement. This is especially important for young, pre-tenured faculty. Experienced, tenured faculty still should visit often with students, but not necessarily in as formal a way.
3. We need to closely look at examinations and other assessment tools for each class to make sure that they are appropriate.
4. We need to observe the classes of young faculty members several times each semester. Once is simply not enough to get a good sense of what is going on. It is important that the observer be someone who is himself or herself a wonderful teacher.
5. We must make the end-of-semester student evaluations of teaching readily available to the faculty member.
6. We must make available to the faculty member opportunities for improving his or her teaching via courses, consultations with campus experts, etc.

The Best Remedy for Bad Teaching and The Best Reward for Good Teaching

Few would argue that the U.S. is **not**, despite its claims, a "free market economy". Nonetheless, it is often true that salary is the primary academic currency. While there are many exceptions, in general, the more effective a faculty member is, the more money he or she is likely to earn. The difficult question is, "How do we define 'effectiveness?'" In far too many U.S. colleges and universities, the definition is heavily tied to how much grant money a faculty member can earn for the institution. Faculty who bring in a great deal of money are themselves rewarded with the largest salary increases. Because there is only a finite amount of salary money from which to draw, those faculty who are the most effective teachers (and who focus on students, rather than dollars), get rewarded the least. Let us be perfectly clear here. I reject the self-serving claim made by many researchers that

the best teachers are also the best researchers. *The opposite is most often true. We who focus on chemical education must take pride in claiming that working with students in our large chemistry classes is time-consuming and rewarding. We must take pride in claiming that this work takes us away from the research laboratory and its demands of grant-writing, publishing and working with a relatively few largely self-motivated graduate students. We must take pride in claiming that the details of being a very effective teacher take time. And we must work to change a system that too often views us as "service workers" within a department.*

How do I know that great teachers are not well-respected in many U.S. chemistry departments? Simple. Except for a very few nationally known educators, most are **not** among the higher paid faculty. Remember, money is the measure of worth in our academic world. A recent survey in the *Chronicle of Higher Education* based on data from the American Association of University Professors[10] shows that full professors at doctoral institutions often earn more than $100,000 for a 9-month academic year. I can think of only one chemical educator in the entire U.S. who earns above this figure, and he does so because he brings in a great deal of external grant and business income to his university. It is not because of his teaching skills. *The greatest single change we can make in the U.S. higher educational system, then, is to economically reward great teaching, and economically censure poor teachers.* Only when great teaching is rewarded with great salaries will teaching be a point of great pride in our colleges and universities.

How I Teach and Assess My Own Students

I have talked a great deal about how things ought to be nationwide, but I have only discussed briefly how I run my own classroom, and how this related to my philosophy of assessment. I will do so now.

My primary teaching assignment is in first-year chemistry for science majors. Many of my former students in North Carolina have weak mathematics backgrounds, with almost none who are prepared for calculus. Most are taking algebra courses in which they are first learning about logarithms and manipulations with exponents. My current students at the University of Illinois have much better math backgrounds. I have two goals with my students. The first is to have them *learn the core ideas of chemistry.* The second, and in my own mind the more important, is to *learn the sense of personal and social responsibility that is at the core of being an adult.* I can not over-state the importance of this latter goal. My students are generally under-prepared to learn chemistry because they have not learned to push themselves prior to entering college. The U.S. high school system is designed to have students pass through to college, without too much stress. And most U.S. colleges and universities accept well over 75% of the students who apply to them, so there is no compelling sense of urgency for students to work very hard. Many students spend far more time on their part-time jobs than on their studies. Some do so because their families need the money. Many do so because it is fun to have discretionary income. Regardless of the cause, the effect is that scholarship is not the primary focus of most students as they enter college.

When I first meet my students at the beginning of the academic year, I say to them, "If you take this work seriously, I will take you seriously. From this point forward, school is your job. I will work with you to do your job well. But if you are not serious, I will not help you." So it is this desire to encourage students who have a heightened sense of responsibility that drives much of my teaching and assessment strategies.

The other idea that drives my teaching and assessment strategies is *a desire to treat others with a sense of dignity.* This comes through in my interactive lecture style, in which I want to know what students are thinking, via my asking them lots of in-class questions, as I discussed previously. Here, then, is how I assess my students for grading purposes.

All of my students take the American Chemical Society's Toledo pre-assessment exam, given by the ACS Examinations Institute (discussed in point #3). Any student who scores below a predetermined level and whose mathematics background is judged to be inadequate is advised to withdraw from the class and enroll in remedial mathematics courses. My grades are traditional, in that I use a sliding scale in which the best grade, an "A", is given for an overall course average of 90%, and other grades are given as follows: "B" = 80% and above, "C" = 70%, "D" = 57%, and "F" is less than 57%. There are "+" and "–" grades that I give within each broad letter grade (a "B–" is between about 77% and 79%).

I give four 50-minute in-class exams and one two-hour American Chemical Society national standard final exam. My in-class exams are 16 partial-credit, multiple choice exams, as I described in section #3. I do not have my first-year students write essays or do unusual library work, because such work does not help them learn chemistry or a sense of responsibility. It only creates more grading for faculty. And the more I have to grade, the less time I have to work with the students outside of class. I prefer to give my first two exams within the first 6 weeks of class, before the "drop" deadline, in which students can withdraw from the class without an academic penalty.

I give 4 minor take-home problem sets as a way of encouraging students to meet each other and work together on chemistry. I assign homework after every lecture period, but I do not collect it. The students have a choice of whether or not to do it. The choice is based on their own sense of

responsibility. The good students will generally do the homework soon after it is assigned. The poorer students will usually wait until just before the test and "cram" in all the homework at one time.

I am available to the students in-person during six office hours each week. I am also available every day on e-mail from 7 AM until about 10 PM, and students are welcomed to e-mail me at any time.

Are my teaching methods successful? In the last 4 years, the number of chemistry majors at UNCG (which I left last semester) has risen from 70 to 185. I believe good teaching and treating students with dignity played an important part in that increase. Students respond to teachers who care about them. Many of our majors have changed from biology to chemistry and biochemistry because the UNCG biology department simply does not invest time in them. They have poor teachers teaching first-year students, and they minimize, rather than maximize, faculty time with students. The chemistry and biochemistry faculty do just the opposite. We invest our time and our hearts into the students. That being said, we also demand that the students have the sense of responsibility that comes with adulthood. I assign many homework exercises of all types, especially drill-type problems. These are certainly important, Yet I do not grade them. I leave it up to the students, themselves, to "sink or swim". Those who do not work hard will sink. Those who have a keen sense of responsibility will swim, because I will work with them. And I will be there for them for the remainder of their academic careers, and beyond.

Conclusion

Assessment takes up a stunning amount of time in the academic work week. The demands are increasing as the national economic picture in the U.S. is becoming increasingly bleak and public tax revenues fall. The great danger of so much assessment is that the *central job of the chemical education faculty member—the research, development, implementation and assessment of effective means of communicating chemistry to our students*, will become a minor focus of our jobs. A significant part of chemical education is, simply, spending time with those students who hunger to know. We must continue to fight for the validity of our primary purpose as teachers. We must fight for the economic rewards (good salaries) that should accompany our investment in students. One notion that all the assessment forms in the world can never contradict is: *Great chemistry teachers inspire great chemistry students.*

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