

# Reflections

REFLECTIONS

## from the Classroom

A collection of essays on teaching  
written by notable teachers  
at the University of Kansas



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# Foreward

*Reflections from the Classroom* is an annual publication to be shared among the University community. We hope you find this inaugural volume insightful and enjoyable. It represents a small collection of essays written by our colleagues across campus. What better way to learn how others on our campus view and learn from their classroom experiences? Many who contributed to this stated that it was an enjoyable experience but a more difficult exercise than they imagined. It is often more difficult to write about what we do and why we do what we do in the classroom than just talk about it. I applaud those who contributed their personal viewpoints about their teaching and sincerely appreciate their contributions. We as a community of learners need to begin to share our perspectives about teaching and learning in a more systematic and meaningful manner. We hope this is one step in that direction.

This volume begins with a white paper titled “The Changing Landscape: Challenges in the Quest for Teaching Excellence,” which was authored by the Teaching Excellence Advisory Members (TEAM), CTE’s advisory board. The intent of the white paper is to prompt a discussion among our colleagues on the challenges and the opportunities that lie ahead with regard to the teaching and learning process.

Following the white paper are five essays on teaching written by a wide range of teachers in varying stages of their careers, representing different disciplines. None of the authors prescribe for us what we should or should not do in our classrooms, but rather they share their insights and perspectives about what they have experienced, learned, and continue to learn about their teaching.

We believe that through our collective wisdom and by sharing our experiences in classrooms, laboratories, and studios across campus, we can begin to better understand that improving teaching and learning is a life-long process. As we share with each other through publications similar to this, and through formal and informal discussions about teaching and learning, we will create a culture that clearly reflects that teaching is central to the mission of the University.

Fred Rodriguez, Director  
Center for Teaching Excellence

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Fall 1998

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# The Changing Landscape: Challenges in the Quest for Teaching Excellence

A white paper by the Center for Teaching Excellence, University of Kansas

An expanding quest for teaching excellence is evident on this campus. Many of the specific ideas that are likely to influence this quest over the next several years are still formative. But some ideas are beginning to take shape, ones that will benefit from discussion by the KU academic community. This paper, a product of the Center for Teaching Excellence's advisory board, is an effort to set forth some of those ideas for your consideration.

The University's quest for teaching excellence seems to be driven by several factors. Effective teaching is one of the University's many missions, and Chancellor Robert Hemenway has often stated our commitment to a student-centered university. The establishment of the Center for Teaching Excellence in the fall of 1997 is both a product of and a driving force in this quest. In addition, some observers believe that phenomena such as distance learning challenge institutions like the University of Kansas to maintain a superior teaching and learning environment for all resident students.

For most of us who teach, a discussion of teaching excellence can be both compelling and daunting. We are drawn to the topic, for it involves what we do at work. But the possibility exists that such a discussion might intrude upon the emotional attachment we can develop toward our existing classroom practices. The authors of this paper hope you find the ideas that follow stimulating but not threatening.

We begin with some thoughts from Parker J. Palmer, a veteran teacher and senior associate of the American Association of Higher Education, who recently wrote these words in *Change* magazine:

"I am a teacher at heart, and there are moments in the classroom when I can hardly hold the joy. When my students and I discover uncharted territory to explore, when the pathway out of a thicket opens up before us, when our experience

is illuminated by the lightning-life of the mind — then teaching is the finest work I know.

But at other moments, the classroom is so lifeless or painful or confused — and I am so powerless to do anything about it — that my claim to be a teacher seems a transparent sham. Then the enemy is everywhere: in those students from some alien planet, in that subject I thought I knew, and in the personal pathology that keeps me earning my living this way. What a fool I was to imagine that I had mastered this occult art — harder to divine than tea leaves and impossible for mortals to do even passably well!"

Many among us can identify with both ends of the spectrum Palmer defines so vividly. We covet more of those times when we "can hardly hold the joy." And we strive to minimize those occasions when our "claim to be a teacher seems a transparent sham." These are important among the reasons many of us have both a practical and intellectual interest in re-examining the issues of classroom teaching.

Those who are serious observers of how higher education has evolved in this country's 200-plus-year history point out that the period of greatest change came 100 years ago as an energized nation prepared for the arrival of the 20th century. The notion of college for the non-elite came to life. So did the use of textbooks and many other conventions so common at this and other campuses. Some observers are suggesting that similarly dramatic changes are emerging in American universities today, in part because of a new and urgent desire to prepare for the 21st century.

Amid such speculation, there is significant evidence to suggest that university-level teaching is being reshaped by several forces. Some of us suspect that those forces include 1) the changing needs of students, 2) the emergence of new technology, and 3) the changing circumstances of those of us who teach. This paper will discuss these three forces for change.

## Changing needs of students

The students who come to us today differ importantly from those who populated this and other campuses a decade or two ago. Some of those differences involve the gender and ethnic makeup of our classrooms. The Census Bureau tells us that more than half of all college students in the United States are now female, a substantial shift in the composition of student populations over the last 10 to 20 years. There also are increasing numbers of students from ethnic minorities and recent immigrant groups. Here in the Midwest we have not yet experienced this change to the degree that states along the outer boundaries of the country have. California and Hawaii already have populations in which groups that used to be called minorities now make up more than half of the residents. Arizona, New Mexico and Texas soon will join this group. So while the ethnic diversity of this campus has changed some in recent years, it seems likely to change more in the coming decade. Even now, we have a responsibility to prepare our students to participate in a culturally diverse society.

The impact of these demographic shifts is found not only in the changing ethnic composition of university campuses but reflected in the diverse characteristics desired by major corporations. Such characteristics include self-awareness, an ability to communicate, an acceptance, respect and appreciation of diversity, and flexibility in behavior and learning. Students will need to learn more about their own cultural backgrounds and contributions of other ethnic groups. Recognition of these changes for campuses such as KU and our teaching mission suggests, among other things, that we re-examine course content and perspectives in areas that track social and scientific progress to be certain the contributions of women and ethnic minorities are addressed appropriately. Similarly, most agree that "world" history or literature or anthropology or sociology, etc., should no longer focus almost exclusively on European tradition.

Today's students may be more visually oriented than those of a decade or two ago, a result of the role television viewing has played in the lives of many students. Some of the new classroom technology discussed later in this paper might help us address the need for more visual content in our teaching efforts.

Some who study changing needs of college students point out that a distinct enemy for an important group of young adult students is despair. Thus, they suggest, it often is important that we convince

students that we will do all in our power to help them succeed (though, of course, that would not include lowering academic or ethical standards). Such observers contend it is useful for us in teaching to keep in mind that respect goes both ways: giving it gets it. They suggest that effectiveness often involves the right mix of rigor and compassion.

Another way student needs are changing involves the growing importance of an international focus in many fields. Business, law, economics, journalism and other fields involve a shrinking world where international dependencies are important to understanding the discipline. Thus many among us believe the content of certain courses will call for an international focus in coming years.

Others who have studied the changes in student needs say that more of our students are trying to obtain "practical" knowledge that they can apply more directly in the workplace. To the degree that this is so, our teaching efforts likely can be enhanced by integrating classroom and "real world" learning. Some teachers speak to this need by using real-world case studies. Some forge partnerships with local businesses and agencies; others suggest a need to do more to prepare students for career placement. They argue that teachers should be made more aware of how their disciplines do and do not provide fundamental and/or practical knowledge for students as citizens and as job seekers. Providing summaries of how different disciplines prepare students for life beyond college might make the courses more relevant and appropriate for some students.

Many students (or their future employers) are especially concerned with our effectiveness in helping students develop critical thinking capacities in addition to the knowledge we dispense and the other skills we help them develop. They urge us to keep in mind that increasingly there is the possibility that specific technical skills will become obsolete early in our students' careers but that the ability to think critically and creatively will continue to be valued.

Closely akin to our graduates' need to think effectively is their need to have a comprehensive education. This suggests that as we teach and advise them, it's useful to remember that a well-rounded general education prepares them to be effective citizens of the world, just as the job-related skills we help cultivate prepare them for employment. Sometimes, of course, the limited resources of time and money put the need for a well-rounded general education in conflict with professional career preparation.

Another growing need for our graduates involves their ability to work effectively with others. Thus, when we have our students work in small groups, we often have learning going on at two levels. One involves course-related material and another involves learning how to achieve meaningful outcomes when working with colleagues. Supporters of this notion observe that the process is enhanced when we teachers deliberately contribute to learning about collaboration as well as learning about course material.

None of this is intended to suggest that the learning environment should be “dumbed down” to accommodate the whims of some students who might be uninterested or unable to handle the intellectual burden of learning material. Many among us continue to believe that it is appropriate to keep in mind that what we are about is to help them learn new things. So intellectual rigor is as valued as ever, even as we adapt to some of these changing student needs.

## New technology

One particularly interesting observation begins with the widely accepted idea that we are in the midst of changing from an energy-based to a knowledge-based economy and that this revolution will thrust universities into new roles. Michael Hooker, Chancellor of the University of North Carolina at Chapel Hill, writes “Two of the greatest challenges our institutions face are those of harnessing the power of digital technology and responding to the information revolution. The opportunities and challenges technology presents are far greater than at any previous time in higher education’s 750-year history.” Hooker believes that those who can manage knowledge will enjoy a considerable advantage over those who cannot. All of this would seem to position institutions of higher learning as more important and more highly appreciated resources in our society. But Hooker and others argue that sweeping changes will be called for in how universities function and that we are not particularly adept at sweeping changes. (One wag suggested that changing a university is similar to relocating a cemetery. In neither case do you get any help from the residents.)

One aspect of technology at the University that prompts little or no debate is the fact that almost all of our students have or have access to a computer. Indeed, serious consideration is being given to whether a personal computer should be a requirement for admission to this University. Some schools

already have such a requirement. Because of this, some teachers are beginning to make syllabi, assignments and some reading material available through list servers or home pages. E-mail is emerging as another vehicle for teacher-student interaction in addition to class meetings, office appointments and telephone discussions. Some are experimenting with list server discussions that require comment from each class member. More software to enhance classroom teaching is emerging, as well. For instance, some among us have had success in adding new dimensions to our classrooms by using presentation software. Others are experimenting with software that can facilitate comparisons of student writing or editing assignments with the professor’s key. Other software programs are becoming integral parts of programs in architecture, engineering, and business, and overall we see expanded use of computers in all classrooms and laboratories.

The ability to manipulate and transmit information and images electronically has given birth to many technology-based teaching tools. We face a large and growing list of opportunities to provide more compelling presentations of material to our students. These tools can arm us to do our classroom-work more effectively; they also can cause us to abandon the comfort of some tried and true teaching practices. Some of this technology requires that we learn to use equipment that can be more complex to operate than programming a VCR. Some call for new investments of class-preparation time. For all of these reasons and more, we can be tempted to ignore this new technology. However, ignoring technology is at least unwise and possibly a danger to what we are about. This technology raises the challenge of distance learning along with its opportunities and threats, some of which are discussed later.

Amid the glamour of emerging technology, it is useful to keep in mind that much of “the old technology” continues to be important in our efforts to create a learning environment for our students. Eloquent lectures still work. So do lively and rigorous Socratic discussions, well-executed laboratory demonstrations, tightly focused small-group discussions, thoughtfully structured examinations, and the mentoring we do in the office, in the laboratory, on the telephone and in the corridor after class. So while we are inclined to urge the consideration of certain new technology to enhance our classroom teaching, none among us advocates abandoning the tools of teaching that still work well.

## Some ways we may need to change

As we age, we tend to lose touch with the current generation of students. Some suggest that keeping teachers aware of cultural trends influencing students' receptiveness to particular approaches enhances teaching. Thus, this argument goes, we need to be aware as teachers that we are teaching to a moving target in terms of generational norms.

A growing number of schools around the country are creating "learning communities," which are very specific efforts to enhance the learning experience. These typically involve faculty members, students and sometimes others collaborating on significant academic goals in environments in which competition, if not absent, is at least de-emphasized. Faculty members become less transmitters of information and more designers of learning environments and experiences, expert guides, coaches and master learners. Often there is an emphasis on connecting learning across course and disciplinary boundaries.

More and more non-traditional students are returning to the University to build on their experiences and increase their capacities. A growing number of adults are experiencing the concept of life-long learning. Some among us suggest that as faculty members we should urge this University to take advantage of this trend and develop curricula and strategies to recognize this change in student profile.

One strategy to meet the needs of our non-traditional students is distance learning, which may begin a domino effect of change upon institutions of higher learning. What kinds of change are envisioned? The Western Governors University may serve as a noteworthy example on one end of the spectrum. Governors of 11 Western states convened and created a "virtual university" combining the resources of their public institutions and linking them via telecommunications. This initiative has raised issues concerning the quality and accreditation standards under which many institutions have operated. Michael Hooker writes, "I believe that the Western governors have issued a challenge that will have earth-shaking consequences in higher education. Once the stranglehold of accreditation is broken, the market will open up for alternative providers and will encourage the development of joint ventures between corporations who could conceivably create a global digital university."

Even as we acknowledge the impact and importance of instructional technology and the distance learning it accommodates, we must encourage enhancement of the special atmosphere on this cam-

pus for residence learning. We need to be keenly aware of the value of learning as a total environment, and we should strive to improve the unique opportunities for learning that exist in that environment.

In addition, some observers say, we must do more to create opportunities for students and teachers to interact and understand each other as individuals. They suggest that breaking down generational and stereotypical barriers will enhance the quality of interactions that we can have as a community of scholars.

All of us are aware that our nation's economy is enjoying one of its most prolonged periods of expansion ever. Most economists agree that a very important factor in that sustained expansion is the dramatic increases in productivity achieved by business firms during the past 10 years. Some observers of the higher education scene suggest that universities are one of the few institutions in our society that have not yet experienced many productivity gains. Some say that distinction will be short lived, suggesting that pressures to achieve productivity gains in academe will soon be at hand. Distance learning clearly will be one important strategy for addressing such pressures. But there also likely will be pressures to teach more large classes. If so, this suggests that more of us will need to become familiar with the special tools, special approaches and special attention that are required to reduce the impersonal nature of large classes.

As we face the opportunities and challenges that lie before us, we should begin to discuss among our departments and across campus some questions about ways we may need to change, such as these:

- In what ways can we encourage sharing, interacting, and learning among all faculty and staff with regard to improving our teaching?
- How can we best respond to changes in the demographic landscape of universities?
- In what ways should the University support a curriculum that endorses the concept of diversity?
- How do we balance the tools of teaching that still work well with the emerging technologies that may deliver instruction in innovative ways?
- How do we determine which course(s) are better suited to be delivered using the new technologies? How do we support such initiatives?

It seems almost certain that the coming few years will involve extraordinary alterations in our teaching circumstances. These and other observations about how life at the University of Kansas needs to and is likely to change can be debated. We hope that these issues can be discussed in various settings, and we invite you to participate in such a dialogue.

# Reflections

by James E. Seaver

For presenting some of my ideas about education and some reflections from classroom experience, it seemed best to me to commence with some memories of how my personal philosophy evolved during my education. Some of my most vivid memories of the time before I could read are of occasions when my older brother would read to me in bed from the historical novels of G. A. Henty, such as *With Lee in Virginia*. At about the age of seven I began to read from the large library in our home. As a sickly youth (because of ear problems), I had much opportunity to read while confined to the house. Because my father loved Shakespeare, he began taking me to the plays even before I was ten years of age.

I attended a private grade school in Beverly Hills, California, where we had very small classes. The most inspirational teacher there for me was Miss Baird in the sixth grade. She loved poetry, especially that of Lord Byron, Percy Bysshe Shelley, and Thomas Gray. We memorized many of their poems, some of which I still recall and use regularly in my teaching. We also had a whole year on ancient history in the ninth grade, which must have had some impact on my decision to study and teach this subject.

At Los Angeles High School my most intellectually challenging course was in American literature, where I encountered Washington Irving, Walt Whitman, Herman Melville, and others. I also remember that my chemistry teacher wrote me a letter challenging me to aspire to higher ambitions than mere good health and happiness.

My real intellectual awakening occurred at Stanford, mostly in the required western civilization program, which I took during my first year, reading philosophy and history written from ancient times to the present and writing a short paper each week which was critiqued in a small class situation. Here I wrestled with the ideas of Plato, Aristotle, Marcus Aurelius, Thomas Aquinas, Rene Descartes, Karl Marx, Charles Darwin, and many others, and tried to judge the worth of their ideas. Bertrand Russell's *A Free Man's Worship*, our last assignment in the western civilization program, was especially important in

the development of my personal view of life. I quote from this essay:

“Brief and powerless is Man's life; on him and all his race the slow, sure doom falls pitiless and dark. Blind to good and evil, reckless of destruction, omnipotent matter rolls on its relentless way; for Man, condemned today to lose his dearest, tomorrow himself to pass through the gate of darkness, it remains only to cherish, ere yet the blow falls, the lofty thoughts that ennoble his little day; . . . One by one, as they march, our comrades vanish from our sight, seized by the silent orders of omnipotent Death. Very brief is the time in which we can help them, in which their happiness or misery is decided. Be it ours to shed sunshine on their path, to lighten their sorrows by the balm of sympathy, to give them the pure joy of a never-tiring affection, to strengthen failing courage, to instil faith in hours of despair.”

During this freshman year at Stanford, while I was auditing a class on the Renaissance taught by one of Stanford's most famous historians, E. M. Hulme, I also realized for the first time the effectiveness of lecturing in class with slides. Late in the year I taught my own classes for the first time while tutoring some of my fellow students for exams in western civilization. I enjoyed the experience, and it was probably important for my career choice in the sophomore year, especially because my fellow students were complimentary and told me I had helped them.

In my sophomore year I encountered the finest and most challenging lecturer in my academic experience, Lynn T. White, Jr., professor of medieval history. His style was provocative and confrontational. He made broad generalities and challenged his students to refute him. Over and over I'd go to the library to try to prove him wrong. The excitement was in the intellectual challenge, and I determined to major with him in medieval history and to seek an academic career -- a decision I've never regretted.

In addition to many language and history classes during my last two years at Stanford, I took a num-

ber of courses in philosophy and religion, such as one on the church fathers of the East. When I graduated in 1940 I emerged more of an Aristotelian than a Platonist, although I've never given up Plato's concepts of the Good, the True, and the Beautiful, as far as we can know them. Also, probably because of what was going on in Nazi Germany, I was and have remained opposed to racial, religious, and various other prejudices. I also became convinced of the power and importance of religion in world history. At Cornell University, where I spent four years on my Ph.D., my first experiences were in small class seminars with M. L. W. Laistner, Harry Caplan, and Carl Stephenson, studying research techniques for reading Latin inscriptions and early medieval documents in the search for the origin of feudalism and the plight of the common man in early medieval Europe. The most effective classroom teacher of the history department in the period 1944–46 was probably Cornelius de Kiewiet, who taught large classes in modern European history largely by the question-and-answer method. When I finished my Ph.D., he gave me some advice that I never forgot. He said you should never go into any lecture class without having read the morning paper and tying in some aspect of the day's news with your lecture. I've done this over the years and have always thought that this establishment of the relevancy of one's lecture in the students' minds was most important.

Oddly enough, one of my most vivid memories of intellectual debate at Cornell occurred at a party for the history graduate students in our one-room apartment. Somehow after dinner we began to discuss "TRUTH" and lying, and we did not break up until dawn. My opponents argued that, ends justifying the means, there would be times when a historian would be compelled to lie. I insisted that a historian must never knowingly lie, for the historian is the guardian of the past -- the shaman, as it were, of our culture's link to our past. We have an especially solemn responsibility to protect our reputations. For a few days there was a distinct fridity in graduate student relations, but we soon got over it.

I never forgot my western civilization experience at Stanford and how much it had meant to me. Cornell did not have such a program, but I was happy to teach western civilization and ancient history at Michigan State College in my first professional appointment in 1946–47. When I arrived at Kansas University in the fall of 1947 to teach ancient and medieval history, I was soon recruited to serve on

committees in KU's recently established western civilization program. Later on, from 1957 to 1984, I was director of this program. This reading and discussion program is still essential for the education of undergraduates in the area of basic philosophy and political science at KU.

When the western civilization program was established at KU in 1945, it was based on English university models. Students studied a designated set of readings for a year, met with proctors from time to time to discuss their reading, and then took a comprehensive exam over all the material at the end of the school year. By 1955 it was clear that this system was not working, mostly because it was foreign to the educational experience of American students. Students were not meeting with their proctors. Unauthorized books called *Analysis of Western Civilization* were on sale, so the students could avoid the readings.

When George Waggoner became dean of the College of Liberal Arts and Sciences in 1954, he appointed a committee to improve the program. I think our committee back in 1954–55 accomplished a lot. Instead of the proctors, small discussion groups led by assistant instructors were introduced. The students took the two discussion classes and then the comprehensive exam, but students were not graded in the discussion groups, which were designed to prepare them for the exam. The number of readings was reduced, and readings -- such as Burke and Paine or Luther and Calvin or Carnegie and Marx -- were often paired to facilitate discussion. Most of the ephemeral readings were eliminated, and we began to concentrate on primary sources, putting students directly in contact with great minds without interference from secondary works. During our discussions our committee decided that students should understand something of their own culture, their own intellectual heritage and baggage of western civilization and where it came from before they attempted to compare their culture to other cultures.

Nevertheless I think that it is true that many of our students almost automatically reject unfamiliar ideas from foreign cultures, and I think that students should have the opportunity to study another culture here at KU -- possibly in a second course in eastern civilization or world civilization.

Reducing the number of readings meant that we could do away with the multiple copies of books in the library, which had been a problem both for the library and for the students. Instead, students now purchased a packet of books at the bookstore; these

included paperbacks of the classics that they were to read, which we hoped might even form the nucleus of a library for many students. The readings that we could not secure in this way were put into a book of readings and a manual. Introductions to each of the readings and suggestions for study were also written. With the manual, the book of readings, and the paperbacks, the students would have all their materials for the course, and they could bring Thomas More's *Utopia* or Niccolo Machiavelli's *Prince* with them to class. Many years later the comprehensive exam was dropped, and from time to time some readings have been dropped and others added. The program is still functioning quite successfully in 1998.

From my experience and based on my own abilities, I decided that the lecture method was my style for teaching history. So in my history courses I lecture, have weekly or fortnightly discussion sessions, and frequently use slides and occasional videos. For instance, in my class "The Golden Age of Greece" we have a textbook supplemented by readings from Herodotus, Thucydides, Xenophon, Plato, Aristotle, etc. For sculpture, painting, and the other arts I use slides, cassette tapes to illustrate ancient Greek music, and videos to show the plays of Sophocles, Euripides, and Aristophanes. I usually give two mid-term exams, a term paper, and a comprehensive final exam of three hours, which includes a map for geographical questions, an objective section, and two broad essays. Thus, in my undergraduate courses, students studied Greek or Roman history from the ancient sources, the modern text, the lectures and discussions, and finally by writing about the material in term reports. From these varied sources they could then establish their own concept of the history of the period under consideration.

In contrast, my graduate seminars in Roman numismatics and the greater Roman historians were small discussion groups of ten or fewer students, to train them in research and writing techniques. The students prepared and composed bibliographies,

selected topics or authors for their essays, and then photocopied their essays for their colleagues to critique. On their appointed days we went over the essays of each student page by page, line by line, in class in what we used to call "Hatchet Club" style. At the end of the term the revised essays, presumably now edited and ready for publication, were presented to me for the final grade in the seminar based not only on the paper but also on class participation throughout the term. Some of these seminar papers were excellent and were published in journals such as *SAN* (the Society for Ancient Numismatics).

We often talk about the university as a "Clearing House of Ideas," a concept very dear to me. I welcomed the Minority–Opinion Forum, which brought to KU the revolutionary ideas of the Minutemen. And later, as chair of SenEx, I monitored the panel when members of the Klu Klux Klan came to Hoch Auditorium, where their violent ideas were exposed and ridiculed. Unfortunately many people are even afraid to let these groups express their ideas and aims, which keeps them hidden and underground. The university should be a place where all ideas, even wild or abhorrent ones, are examined and evaluated.

In conclusion I would like to urge teachers to concentrate their efforts on those things they do well in classroom situations, whether it be lecturing, discussion in small groups, or using visual aids, etc., but always in combination with continued research and writing. The teaching of developing minds is a great privilege. It is also a great responsibility to not fail our students, our own teachers, and the great thinkers and scholars who have preceded us.

*James E. Seaver* is a professor emeritus in the history department. He taught at KU for 43 years before his retirement in 1989. Since then, he has continued to teach History 502, The Golden Age of Greece.

# Teaching as Learning

by Elizabeth Schultz

My first teaching experience was at a Japanese girls' school. Immediately following my college graduation and knowing little about myself and nothing about Japan, I arrived at Baika Gakuen to teach English for three years to junior high school, high school, and junior college students. With 50 to 60 students in the junior high and high school classes and several of these large classes, meeting one day a week, I wondered how I would ever learn my students' names. Entering my first class, pushing open the sliding glass door at the back of the room, I was confronted with rows of girls, all seemingly identical with their shiny black hair, parted and plaited in neat braids or cut in short bobs, with the navy blue jackets of their uniforms squared at their shoulders. When I walked round to the front of the room and turned to see the faces of these girls, however, I perceived a multitude of differences – in their faces, expressions, gestures – placid, demure, quizzical, indifferent, expectant, haughty, smiling, squinting, scowling, furrowing a brow, wrinkling a nose, lifting an eyebrow, looking me over. In some 40 years of teaching since that first class at Baika, I may have generalized about the alchemy of an occasional class, but I remain amazed by the diversity of individuals I meet in every class.

Knowing that my primary value at Baika lay in my being a native English speaker, in the classes for those junior high and high school students, I cautioned myself to speak in short sentences and asked simple questions, "Do you like ice cream? How many brothers do you have? What are you studying?" For junior college classes, I had been assigned an anthology, compiled of brief excerpts from English canonical works – two pages of *Beowulf*, an episode from *The Faerie Queen*, a sonnet by Shakespeare and one by Donne. Before long, however, questioning the usefulness of my activities in the classroom and the meaningfulness of the subjects I was teaching, I wrote a letter back home to my favorite college English teacher. His two-fold reply seemed initially both puzzling and paradoxical, but struggling over time to understand his advice, I've come to cherish it. First, he said, "Be certain you have something to give your students."

Second, he sent me a copy of Theodore Roethke's poem, "The Waking." As I came to interpret his first words of advice, I considered my responsibilities as a teacher – not only to know a body of knowledge thoroughly and thoughtfully, but also to convey it carefully and clearly. In contemplating Roethke's poem, whose final couplet – "I wake to sleep, and take my waking slow. I learn by going where I have to go." – I've inscribed on my heart, I recognized that teaching was inseparable from learning and that both were an ongoing process. Thus, if, as a teacher, I was responsible to comprehend and convey a body of knowledge in a cogent manner, I realized I also needed to question that knowledge, challenge it, stretch it, change it, check it against my own life and the lives of others.

In graduate school, I was offered the opportunity to teach a discussion section for the University of Michigan's freshman honors sequence: two semesters of classical Greek writing in translation. Although intimidated by Homer and the great Greek playwrights, I was daunted by the possibility of teaching the philosophers, Plato and Aristotle, and the historians, Herodotus and Thucydides. However, despite my feeling the whole weight of Western tradition oppressing me in that first class on Plato, I was relieved by being able to express and share my anxieties. I spent days in the library stacks reading critical interpretations of Plato and the other great Greeks, but nights I spent with my fellow teaching assistants considering possible ways to bring them into our students' lives. None of us being classicists, we struggled together, identifying key passages and images in our texts, checking mythological references, considering the significance of the multiple aspects of Greek culture, noting differences among our writers, formulating outlines, study questions, quizzes, trying to understand why one class seemed to catch fire and another didn't. To this day my teaching is enriched from a collaborative sharing of methods and experiences, and cherishing those late-night pedagogical discussions in graduate school, I regret that they have occurred so rarely since.

Arriving to teach English at the University of Kansas in the late 1960s, I took my favorite teacher's first words of advice very seriously. To prepare for three new classes my first semester at KU, I organized my time so that I could read the literary texts I'd assigned my students as well as critical interpretations of them on the days I wasn't teaching, leaving enough time at the end of these days to write out, by hand, word-for-word, full lectures for each class. That first year, students came up to my desk at the end of classes, walked with me across campus, sought me out in my office, testing my assertions, correcting my facts, raising questions I'd never considered. Their eager persistence and their gleaming insights suggested the value of opening the class to discussion and eventually of transforming the class into a dialogue, even a symposium. The amount of time necessary for preparing classes has remained the same in my years of teaching, but the nature of my preparation changed as I shifted from lecturing to listening, from asserting to questioning in the classroom. I believe I'm teaching best when I'm learning best, and I'm learning best when both my students and I have the most questions.

I still have to know my literary materials, to give something to my students, but increasingly, I realize that often the most meaningful gift I can bring them is a question. I've come to realize that the most difficult and significant part of teaching is discovering good questions. The good question, for me, is open-ended, one with several answers and no final or absolute conclusion. The good question leads me, in the process of preparing for class, into revelations about the literature I teach and, when presented to the class, leads us all into further revelations. That same beloved college teacher had written on the blackboard on our first day of class a line from e. e. cummings – "Who asks a beautiful question receives a more beautiful answer" – a line which I remembered, but which I only began to understand in the context of teaching.

In the fall of 1969, I taught my first African-American literature class, and two years later, in the spring of 1971, my first class on Melville – both memorable classes for the instruction they gave to me. During these years national politics caused teachers and students to scrutinize the subject matter of their courses, the organization of their classes, the structure of educational institutions. In response, KU had its diverse sit-ins and teach-ins, its cancellation of final exams, Free University courses, Liberal Arts and

Sciences courses designed and taught by students with a faculty mentor, new programs in Black Studies and Women's Studies. The operant word at that time was "relevancy," and the literature I taught resonated when I tried, in conceptualizing my questions for class, to relate them to contemporary concerns. Thus, in the African-American literature class, we considered the relationship between Frederick Douglass's fight against his master and the burning of Watts, Detroit, and Newark; in the Melville class, we considered the relationship between Ahab's pursuit of the great white whale and Nixon's pursuit of victory in Viet Nam. With final exams optional throughout the University in the spring of 1971, my Melville students created projects – a synchronized swimming show, a whale mobile, a whale chalked in on Louisiana St., a Polynesian initiation ceremony, a welded iron statue of Ahab – in which the class as a whole could participate. Making connections between our reading and our lives and making connections among ourselves through these stunningly varied creative interpretations of our reading, both my students and I became more deeply engaged in the process of making literature meaningful during these tumultuous years.

Committed to examining issues of multiculturalism and feminism in all of my classes, I have actively tried to encourage my students to consider the causes and the effects of racism and sexism. While recognizing that both of these destructive and degrading cultural manifestations originate from a socially constructed power base – whether economical, political, or psychological – I failed to see that I, as a teacher, had also been placed in a powerful position. Although teaching gives me the wonderful power to challenge, create, stimulate, inspire, point to infinite possibilities, it also allows me the dangerous power to control, manipulate, dictate, humiliate, frustrate, undermine, order, shape, shame, discourage. During the late 1970s, I remember scolding a student in the midst of class discussion for not having done the assigned reading for the day. Conscious of her perfectly coifed hair and her beautifully done nails, I had justified my action by rationalizing to myself that if she'd had time for prettifying herself, she should have had time for *The Scarlet Letter*. I succeeded in embarrassing her so intensely she wept; I succeeded as well in discrediting myself as a caring person with this group of students through my thoughtless and intemperate reaction to another individual. In shaming this student, I had shamed myself. I realized, consequently, that as the physician must learn to heal himself, so

the teacher must learn what she herself teaches. Those individual girls whom I had so delighted in seeing from the front of that long-ago Japanese classroom were not simply faces; each one I would come to realize had her own story and voice. Although a student may be as responsible as I am to give something to the class, I, as teacher, by virtue of the power allotted to me by our institutional arrangements, have the particular responsibility to respect the integrity of each student, recognizing that students do learn in different ways and at different speeds. My failure to do so jeopardizes the entire teaching endeavor.

Teaching African-American literature, the works of Melville, and, since the late 1970s, American women's writing, I found myself increasingly eager to extend my exploration of the subjects I was teaching through writing and research. Questions and connections which I generated in the process of preparing my classes as well as questions and connections which students generated during class discussions came to provide me with the impetus for developing a range of articles and a book. In retrospect I see that my "research agenda" has evolved in direct relation to my teaching. Thus essays on the blues and on communities in African-American literature, on popular American fiction and *Moby-Dick*, on friendships between black and white women in American literature all sprang directly from my classes. However, if my teaching sowed the seeds for my writing and research, my writing and research has, in turn, fertilized my teaching. An autobiographical essay on my becoming a feminist became the basis for my teaching a course in American women's autobiographies, and a recently completed memoir on my coming-of-age on the shore of a Michigan lake is the basis for my course this fall on nature in American literature. I count myself fortunate that as my avocation and vocation came to be one, as life enhanced teaching, and teaching enhanced life, research and teaching have also been reciprocal, each reinforcing and illuminating the other.

Since my first semester at KU, the English Department has required that I teach an American literature survey. A course required of undergraduate English majors, the survey is primarily a service course and does not necessarily offer the teacher the intellectual invitation which a course designed in relation to her topic of special interest does. Yet, looking back over 30 years of teaching American literature survey courses, I see what they have taught me. Initially, when I was writing out full lectures for my

classes, not only did these classes mimic my own teachers' methods and syllabi, but they were also dependent on anthologies similar to those which my earlier teachers had used. However, with the expansion in theoretical approaches to literature and in the canon of American literature, an expansion largely in response over the past 15 years to the ethnic studies and feminist movements, the opportunities for interpreting American literature and for designing American literature survey courses have multiplied in diverse and significant ways. This intellectually provocative proliferation of theories and of texts has prompted me to read more American history, to examine multiple textual materials – including legal documents, political tracts, and diaries – to pay attention to the role of publishers and the demography of audiences, in addition to attending a range of conferences and on-campus seminars. It has prompted me to consider such questions as "When does American literature begin? What is an American? Who determines identity anyway? How does class affect the lives of women, of African Americans, of poor workers in the United States? How have writers without power developed their authorial voices?" Contemporary American literature anthologies now provide teachers of survey courses with what F.O. Matthiessen in 1942 saw as Melville's dilemma in writing *Moby-Dick*: "the problem of plentitude." Such a plentitude as appears in American literature necessitates ongoing reconsideration of text selections and syllabi organization as well as class presentations and preparations.

Thus in the process of teaching this service course in American literature, I have become aware of the possibilities for both learning and teaching that may result by being open to expanded options in my own area of study. Through the integration of researching, writing, reading, listening, questioning, connecting, giving, receiving, teaching has allowed me to continue to try to understand how human beings struggle to create their lives in relation to others and to their universe.

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# Learning

by Tim Shaftel

"Breasts."

"Huh?"

"You know – BREASTS."

"Uh yes, I know breasts." (Giggles)

I'm a little dizzy. Most of my career, especially the good parts, start spinning before me.

"Can you depreciate breasts as an asset?"

"Er, no, we only keep track of economic assets – and depreciate the ones we view as being productive over an extended period of time." (Faint smile)

"What about this article?"

"Pardon?"

"What about this article with the picture?"

Nearby students crowd in; the rest, around 500, have their undivided attention on the center of the room where I stand, mouth opened, not much coming out.

"Uh, well, um, let's see now."

A picture is thrust my way. I'm looking at what seems to a woman hiding behind two large shopping bags. The caption says, "Judge allows tax depreciation of breast-enhancement surgery for exotic dancer." I'm saved.

"Well now, this, as you no doubt are aware, is a tax issue. This class is financial accounting. You'll be learning all about tax accounting when you take that course in a few years. Now if you will proceed to page 74 of your text . . ."

The students settle back in their seats, the glaze returns to their eyes, I start feeling comfortable again, nobody learns anything today.

I first learn about the teaching moment driving to classes at Carnegie–Mellon University on a snowy winter day. I am from Los Angeles, driving slowly and with some tension. My fellow Ph.D. student is Canadian and unconcerned. Cars are turned around everywhere as I top the hill in my relatively new VW bug. I slam on the breaks and turn the wheel. Nothing happens; like a dream my car continues in a straight line, a slow slide toward the side of another car spun side-ways in the road. Seconds before impact, Bob in a calm voice says, "Okay, Tim, slowly take your foot off the brake and steer around that

car." Bob doesn't say another word, we don't have a wreck, I learn a lot about momentum.

Exploiting extemporaneous teaching moments takes some skill and experience. Anticipating what might happen during a discussion, lab exercise, or group presentation is the first part. Preparing a coherent response is the second. But you cannot always wait until something happens to teach. One can create a teaching moment. As far as I can tell, most teachers at the university level were taught to teach by being put in an isolated classroom full of freshman or sophomores with the command: teach. Nowadays we might go one step further and ask new teachers and Ph.D. students to meet, either formally or informally, with a teaching mentor. Right now, in our school, that's me.

Many of our new teachers have accepted the fact that doing research is no longer a sufficient condition for their long-term career success. In fact, many of them seem to believe that anything less than a perfect teaching rating automatically consigns them to oblivion. This is a good situation for me as their teacher. Somehow, the sheer terror of teaching for the first time creates a whole bunch of teaching moments for my interaction with them. Because I need to give them the idea they have a lot of control over the outcome of their teaching, I usually tell these student-teachers first about the value of a good bunt. A good bunt moves the runners into scoring position, the fans go wild, and with great good luck the bunter gets on base, too. Home runs are great, of course, but trying for one can cause a lot of stress and increases the chances of striking out – something that is not so good for either student or teacher.

So how do you bunt in the classroom? Planning, organization, and preparation. If I were lecturing to a class about teaching (which I don't), I'd find these topics to be about as interesting as cold oatmeal. We all do planning, organizing, and preparation, like it or not. We pick a book and/or other materials, we decide on the order of coverage, we determine test dates, homework, attendance policy. Most of the global planning for the course occurs before classes start and is conveyed to the students in the course syllabus. When I ask my student-teachers to prepare a syllabus

for me to review they discover first-hand that the scrap of paper they get at the beginning of every class is a bit more complicated than first meets the eye. Exactly how much and what should be covered each day? When should the exams be scheduled? Should there be exams? Homework? Papers? Participation credit? How much? How many? What determines the grade? All sorts of questions that these student-teachers would rightfully ask their teachers suddenly has to be answered for their own students.

Typically I have a lot to say about any given syllabus offered by my students. Mostly, however, I spend the time calming them down and teaching them the most important single word in the syllabus vocabulary. The word is tentative. The first time I teach a class, I plan on reissuing the syllabus a few times. I taught an intermediate class once where I handed the students the second revision of the third tentative schedule right after Spring Break. Issuing revisions takes some skill if you don't want to tick off the students. I generally overkill on material and assignments when I am planning a class. This doesn't bother me much since it means that any revisions normally include the elimination of some of the students' work. I use the fact that I am eliminating assignments to get them to buy into, say, an acceleration of the date for the first exam. I have never had a student complain about the tentative nature of the syllabus if I can explain why I am making the changes, if I seek their opinion about the modifications, and if I write it all down and hand out a new tentative syllabus.

Making modifications to an already existing syllabus is simple compared to an outright systemic change in the entire course. "All right class I've gotten tired of the Boer Wars so from now on we're studying inter-galactic explorations as depicted in Star Trek." Although it should happen rarely, there may be a time when the best thing for all concerned is to change a course completely. I taught a graduate course at the Regents Center a few semesters ago that was depressing. Since the Regents Center students all had work experience, I decided that lecturing on the material would be far less interesting than using a case approach to the subject. The idea of the case approach is that the students will be invigorated by a real or near-real problem. Recognizing the problem as one that might actually occur, they work hard to solve it with tools that are brought out in discussions moderated and directed by the instructor. For this class, the approach bombed.

These students had already spent the day being pretty invigorated in their own jobs. Coming to class at seven in the evening and having to fight their way through a long complex case until after ten turned out to be no fun at all. So I did the only sensible thing. I gave a mid-term evaluation. At that time my overall rating was about two on a five-point scale. None of the other measures were much better. Two, roughly speaking, translates into the word "poor" on the Business School's evaluation forms. The extended comments were unreadable. Next class I told the students that they obviously didn't like the way the class was going and that neither did I. Did they have any objection to me tossing out the entire syllabus, the cases, the evaluation mechanism, etc. and replacing them with an entirely new model with lectures broken up by short and to-the-point cases? The exams would be a bit different and there would have to be some problem sets as homework. They had no objection and from that day forward the course became darn fun. The material was the same, we actually covered more topics, the discussions were incredibly lively. Students volunteered information about how their company solved a similar problem to the one I'd just worked. The class rarely finished on time. How was the course perceived on the final evaluation? Eighty percent of the students rated the overall class a five; the other students were not far behind.

I like mid-term evaluations and encourage (read, require) my student-teachers to do one someplace toward the middle of each semester. Not many faculty members do a mid-semester review. And, I admit to being a little queasy about the idea of actually asking for student comments. On the other hand, it never made any sense to me to ask for feedback after there is no possible way to make any changes to the present class. In fact, I usually find that changes I make as a result of the comments of one class are rarely appreciated by the next. "Please collect homework regularly so we'll do it," was the unanimous recommendation of the fall class. "How come you collect homework all the time?" was the spring response. By having a mid-term evaluation, the fall comments would cause me to change the fall procedure at little or no cost to me. In the spring, I'll go right back to what I prefer and wait for that group to ask for a change. I even might use such a change to extract a promise of positive behavior. "Okay, if I give you a five minute break in the middle of this six hour class, you're going to have to be here on time so the class can start promptly." "No

problem!" Another advantage of doing a mid-term evaluation is that you can respond to misconceptions about the class: Real comment in a four-credit, required course: "Gee, this class is hard; we should get four credit hours." Real answer: "Gee, the registrar thought so highly of your suggestion that the course was retroactively changed to a four-credit course."

You may have noticed that I spend a lot of time in some form of dialogue with the students in my classes. For me, this type of interactions helps me with what I think is the single most important key for successful teaching – motivating the students to care about learning. This is how you get the home run.

So how do you get students motivated? One way is to have a good idea yourself about why your topic is worthwhile. More importantly, your students have to trust you when you tell them that the topic is important. The interactions I have with my students help me to build that trust.

Along these lines, knowing the students' names is a great idea. I can't possibly know everyone's name when I lecture to 500 students. I can ask them their names when they ask a question or participate in one of my laboratory exercises and then use it. If I have less than 50 students, I work very hard to memorize their names a few at a time until I know the whole class. Most students, especially in Kansas, were brought up to be friendly and respectful people. Calling them by name makes you practically one of the family – a distant cousin at the least. If I can, I use breaks, group assignments, and other interactions to find out things about them and to let them know things about me. I go to the basketball games, I attend Lied Center concerts, I think making them pay to attend KU is the best deal the state ever made and that parking around campus is a drag. We have a lot in common. Also I love the stuff I teach and I really do think it's important. By extension my students must, too. I try to tell my students why the material is important on a daily basis.

Exactly how you approach the motivation issue varies with the course and the level of the student. We don't really expect to have to motivate Ph.D. students in the same way as sophomores. Still, students look to the teacher to give a few signals about the way he or she views the material. If the teacher thinks the material is useless and boring, then how can students

be expected to feel differently? If the professor is so unmotivated by the topic that he or she does not create a syllabus, or bother to let you know that class attendance is important, or demonstrate any concern whether you learn the material, then why would you feel enthusiastic about the learning process?

One of the things that I don't understand about the idea of teaching at an institution like KU is that it's constantly placed on the other side of the fence from research. I've always thought a university such as KU ought to have a one-word mission: learning. Ask a group of researchers why they like the things they do and they will tell you, in highly animated terms, that it's exciting and important and useful. Pin them down a bit more and they might say that discovery is fun. Take this idea to the classroom. Convey your interest and excitement and enthusiasm to someone else. They'll get it, because they will be learning and you will be hitting a home run. I don't care how dry you think your topic might be, learning is fun. If you don't believe this try accounting; it's like dry toast in the Sahara dessert. Which is why I need those teaching moments when they happen and I need to be ready when I get the opportunity.

"Breasts."

"Huh?"

"You know – BREASTS."

Ah, here at last is my redemption; I can tell students how tax and financial accounting are different. That this particular judgment may not have a bearing on whether or not financial accountants might recognize this asset. We can talk about how a compelling argument might be made for the inclusion of breasts as an asset for this performer. I can engage them in a discussion of what category of asset this might be and over what time period this asset might be depreciated. I'm ready.

"Yes, I know a lot about breasts."

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# A Decade of Combining Teaching and Research

by Jeffrey Aubé

Today's discussion of university teaching often sees research cast as the enemy of good instruction. Even within the academy, faculty seem increasingly polarized into two groups: those who do research and those who carry the burden of "service" teaching. Meanwhile, the need for excellent and innovative learning is greater than ever. Professional persons must identify how one's field of expertise is affected by other areas and how it has its own effect on them. Increasingly, citizens in a democracy must make personal and political judgments on issues that arise from realms that have little to do with personal experience. Consider the current debate on human cloning as occasioned by the birth of Dolly.

I teach in the School of Pharmacy, in the small department of medicinal chemistry. Students enter Pharmacy School after two years of pre-pharmacy training at KU or elsewhere. Once admitted, they undertake four years of professional education to receive a Pharm.D. degree that permits them to work as professional pharmacists in the retail sector, in hospitals, and in industry. KU has the only pharmacy school in Kansas, and its graduates enjoy an essentially 100% placement rate in their field.

Despite this good news, pharmacy students have reason for concern. Pharmacy is a fast-changing field, with serious encroachments arising from the decline of the family-owned pharmacy, mail-order retail, and other professional issues. More than ever, students expect skills that allow them to keep up with their rapidly changing – and broadly based – profession. They want relevance.

The School of Pharmacy is also the home of a cadre of dedicated, active research scientists and practitioners, in fields as varied as cancer chemotherapy, drug discovery, drug delivery, pharmacoeconomics, and basic chemistry. The School has been listed third in the nation among pharmacy schools for overall funding from the National Institutes of Health for the past two years, its faculty widely honored for their research accomplishments, and graduates from the School's various graduate programs are highly sought for positions in industry and academia.

My own experiences from the trenches of professional school education and research suggest that the life of an academic scientist can be quite different from scholars in other disciplines. But I believe there are similarities between learning at the undergraduate and graduate levels. And, it has been my experience that research in the sciences is, in fact and practice, a valuable form of teaching. It is possible to combine a love for teaching and research at the university setting, but challenges await those who try.

## Medicinal chemistry is an interdisciplinary subject

Like most professors, I learned to teach through experience. As an undergraduate chemistry major, I was assigned several lab sections of general chemistry in my senior year. Later, I had the privilege to teach a discussion section of introductory chemistry for the infamous Professor James Bonk at Duke University ([www.duke.edu/~jac3/origin/bonkistry.html](http://www.duke.edu/~jac3/origin/bonkistry.html)). These assignments provided useful practice in grading quizzes, setting up undergraduate laboratory experiments, and working problems from the textbook. However interesting and challenging those experiences were, they did not adequately prepare me for the job of constructing, planning, and executing an entire course. There was an additional problem: I had no formal education in the subject I was to teach.

A reasonable person might ask how an individual can be hired to teach a subject that he or she does not know. In my field, it happens all of the time because medicinal chemistry is not a pure science – it exists only when a variety of related but distinct disciplines come together. In addition, few academic departments produce medicinal chemistry Ph.D.'s *per se*; KU's is one of a handful. I was offered the position here because my research expertise, synthetic organic chemistry, was attractive to the department.

A brief primer on the taxonomy of chemistry and pharmacy is in order. Chemistry, broadly speaking, is the study of matter. Everything one touches is made of chemicals. Water. Table salt. Plastics. Teeth.

Fingernail polish remover. Pharmaceuticals. Wood. Gasoline. Small rocks. DNA. Paper. Organic chemistry is the study of compounds based on the element carbon. The list gets a little shorter. Plastics. Fingernail polish remover. Most pharmaceuticals. Gasoline. DNA. In contrast, the study of those particular chemical substances found in living organisms is biochemistry. Water. The components of teeth. DNA. And, above all, all kinds of chemicals present in people and other living things.

My specialty in graduate school, and the field in which I still work, is a subset of organic chemistry called "synthetic organic chemistry." People like me are interested in finding new ways of converting one chemical compound to another, in developing useful processes for the preparation of important substances from readily available materials (usually petrochemicals or simple biochemical entities like peptides or sugars). Since the vast majority of current drugs are synthetic chemicals, synthetic organic chemistry is an essential science for the development of new pharmaceuticals. KU's department has stressed this discipline since it was founded in the 1950s and it remains one of our strengths.

I, like others, was expected to set up an independent research program as well as jump right into teaching in the undergraduate pharmacy curriculum in medicinal chemistry. But what exactly is medicinal chemistry? Well, it sure ain't synthetic organic chemistry. Medicinal chemistry is concerned with understanding how the chemical structure of a drug affects its action in the body. To do this, it is necessary to understand some organic chemistry, basic biology (physiology and anatomy), biochemistry, pharmacology (the biology of how drugs interact with the body), toxicology, metabolism, and pharmaceuticals (the study of drug stability, analysis, and issues related to how long-acting a medicine is). I had taken formal course work in exactly one of those seven subjects.

Like colleagues before me – almost all of whom have come from similar backgrounds if not from quite the same poverty of perspective that I did – I learned the material as I went along. This made for some late nights with the textbook trying desperately to understand what a "receptor" was or how steroids worked. The fact that most of the students already had taken some of the courses I was lacking was no small motivation. I vividly recall demonstrating my naiveté that first year by incorrectly pronouncing the word "edema" during a lecture. Got quite a laugh that day.

I was fortunate in that the departmental chair at that time, Lester Mitscher, a distinguished professor, took me under his wing. Having taught the course previously (and having come to KU after a productive career in the pharmaceutical industry), Professor Mitscher shared his notes, key literature references, and personal experiences with me. Throughout my first few years, Les always took time to discuss teaching evaluations, research progress, and academic life in general. The late Professor Mathias Mertes, an outstanding teacher often honored for his classroom prowess, and my other colleagues were also positive influences. I was lucky to have such friends as mentors some years before the term became popular.

Although I brought a good specialist's background to the classroom, I was highly dependent on outside colleagues to learn and present material from the many ancillary disciplines that were important. It is important to stress that I did not become expert in, say, pharmacology or biochemistry, in any real sense. I was only able to present those subjects as they impacted the main focus of the material. Professor Mitscher always liked to point out that the noun in "medicinal chemistry" is, indeed, "chemistry."

Over the years, I have grown more likely to consult a group of authorities who I had previously missed, in part because they were literally in front of my nose. The students themselves, I eventually learned, had taken all of those courses that I had missed, and many of them were pleased to share what they had learned. More important, many of them have experience working as pharmacy technicians in drug stores or hospitals. As such, they have a much better idea of how often different drugs are prescribed than I could ever hope for. When we are discussing a particular drug, it is useful to ask students currently working in pharmacies a few questions about it. Does their store carry it? Is it prescribed often? It keeps me honest to recognize the limits of my expertise, and their input creates an environment of shared discovery.

I am fully aware that some pharmacy students regard medicinal chemistry as a rite of passage more than an essential part of their curriculum. Certainly many find the course difficult. In addition, many point to the fact that they will not be doing chemistry as a practicing pharmacist; rather, they will be using their pragmatic knowledge of what drugs do and how they interact as learned on the job, as well as in their professional (as opposed to basic science) courses. But the fact remains: drugs are chemicals, and to

really understand their properties requires an appreciation for the properties of chemicals. Understanding, as opposed to memorization, enables the practitioners to evaluate the changes that are occurring in their profession. Pharmacy students need to know the basics of business economics for the same reason.

Thus, pharmacy students receive a rigorous introduction to the tenets of organic chemistry as well as biochemistry in their pre-pharmacy education. They learn detailed pharmacology by real pharmacologists. They take a lot of courses that describe mathematically how drugs are absorbed into, travel through, and are excreted from the body. And they learn how to count pills, fill prescriptions, counsel patients, and check for adverse drug interactions from actual pharmacists. As medicinal chemists, we try to connect the principles learned in organic chemistry, and in so doing, reinforce them, with issues that relate to practice. We try to give them an appreciation for how basic scientific investigation has led to the hundreds of drugs on the market today. We expect them to understand something about how a drug works by looking at its chemical formula. In this critical way, students experience these diverging fields coming together for the first time in their curriculum.

### Meanwhile, back in the laboratory...

While I was struggling to figure out the vagaries of teaching medicinal chemistry to pharmacy students, I was also struggling to begin an independent research career. Medicinal chemistry is a laboratory science that requires a great deal of hands-on effort. In my area, organic chemical synthesis, this entails chores like distilling solvents, purifying starting materials, washing glassware, building apparatus. The main event is the "reaction," where we take a molecule, allow it to interact with some other molecule – a reagent – under carefully defined conditions of temperature, atmosphere, and pressure. After carrying out this procedure, we need to examine the outcome of the experimental process. This requires isolation from solvents, purification from byproducts, and chemical analysis to figure out what happened. This whole process is a "step." A typical dissertation project might entail the "total synthesis" of some target molecule – an anticancer agent or an antibiotic – comprising a number of steps. Total syntheses requiring 20 steps are common. It is hard, detailed work.

Most of the work is done by graduate students. Their goals are as pragmatic as those of the pharmacy

undergrad: they want to learn a skill, place it in the broader context of science and society, get a job. The key difference is that graduate students are required to add something to the sum of knowledge in their field. In science, this means that they cannot passively soak up knowledge. They must accomplish something that has never been done before.

Graduate students undertake a rigorous array of courses and qualifying examinations. They also teach laboratory sections or other classes. Our department administers monthly cumulative exams, on which we can ask anything about chemistry without prior warning. The student is expected to respond based on her or his store of general knowledge. A student must pass seven such exams. Then comes the oral exam, in which a student's committee will grill the doctoral candidate on any subject bearing on the dissertation topic. A student who passes this examination is then asked to write a full-length, detailed research proposal on a subject unrelated to the thesis. In addition, there are seminar presentations, writing papers for publication in scholarly journals and, oh by the way, there's the task of writing a book-length dissertation that details the research that the student has been working on all along. The process typically takes a little more than five years, but seems like more. Every step is taken with the participation of a faculty member, who writes and grades exams, teaches the courses, works on the papers, critiques the proposals and seminars and dissertations.

Most fresh, first-year graduate students have very little idea of how science is actually done. For this reason, graduate students begin work on a project of their major professor's design. Typical research groups consist of a major professor, from one to 20 graduate students, and a couple postdoctoral associates (post-Ph.D. scientists who are doing a kind of internship before obtaining a permanent position).

The professor's job is to provide guidance and advice, equip the laboratory, collaborate in the writing of research papers, and obtain the research funding that permits the entire enterprise to exist in the first place. Grants pay for the chemicals, equipment, computers, travel to scientific meetings, books, journals, and chemical analyses. The major professor is permitted to draw salary for the summer months spent on the research project (although work continues unabated throughout the academic calendar). But the largest chunk of money goes to stipends for graduate students in support of their graduate studies. Although it is fashionable in some circles to decry

the effort and money spent on research as detracting from the undergraduate teaching mission of the university, the vast portion of costs associated with laboratory research is obtained through highly competitive, peer-reviewed research grants (normally from the National Institutes of Health, National Science Foundation, and other federal agencies).

Researchers are expected to pay their own way.

My argument is that it isn't a case of research vs. teaching. Working with graduate students is an extraordinarily satisfying kind of teaching. It does contrast sharply with the undergraduate experience: there are fewer graduate students, but the responsibilities to each individual student are greater. My challenge with undergrads is to introduce a fairly broad subject in an interesting and accessible way. The graduate student must study an extremely narrow problem in extreme depth, so it's my job to present him or her with projects worth doing and then to exert vigilance to ensure absolute rigor in their pursuit. In addition, we try our best to confront directly issues of ethics and research propriety. In my early days, I worked in the laboratory alongside the students and taught them techniques and procedures by demonstration. Now, techniques are passed down from experienced workers to newbies, and my responsibilities have shifted to framing the problem, carefully examining and discussing results in detail, suggesting new experiments. All of this is teaching.

I believe that the intellectual cross-pollination between research and undergraduate teaching is in fact a virtue of the research university. To teach medicinal chemistry, I needed to be an expert in something, and in my case it was chemistry, pure and simple. Research and teaching at the graduate level forces me to aspire to expert status and brutally reminds me when I have failed to make the mark.

In addition, graduate research is worthy in its own right. Almost every modern scientist who has synthesized a drug, discovered a gene, or invented a new superconductor was a graduate student at one time. In addition to their research, graduate students contribute mightily to the educational mission of the university themselves by teaching laboratory courses, leading discussion sections, and grading exams. Graduate students are our next generation of scientific and academic leaders and, quite possibly, the most under-appreciated group on campus.

Although I have not stressed the place of the undergraduate student in the laboratory, it is significant. Although I had taken several excellent under-

graduate courses in organic chemistry, I never even considered becoming a chemist until I met Professor Bob Gawley at the University of Miami. There, I joined Gawley's research group for the express goal of fulfilling a requirement for an honors degree. There, I did undergraduate research for two years and, in so doing, found my life's vocation. Because of what this experience meant to me, I reserve room in my research group for chemistry or pharmacy majors to work alongside the graduate students. Recognizing the value of undergraduate research blurs the distinctions between teaching and research even further. Active learning, in which students learn by doing and faculty serve as facilitators rather than talking heads, has received increased attention in education circles. Research, for undergraduates, graduate students, and faculty, is nothing less than active learning at its most effective.

Part of the polarity within the academy stems from a central question: what is the proper balance between teaching and research? It takes time to do good research and it takes time to put together a good course. Each job can be a full-time responsibility. It is easy to get burned out and discouraged. It is equally easy to slip into spending more time on whichever activity one enjoys more. There are additional pressures: family responsibilities or the service work that comes to every faculty member but that seems to migrate toward the over-committed. Many faculty members enjoy both teaching and research and make the time, but there are limits to what is possible by any given individual. The time faculty spend working with graduate-student driven research projects should be recognized as the instruction it is. In some cases, it is both honorable and pragmatic to divide the load among faculty, as long as contributions of both teachers and researchers are duly noted and rewarded. The important thing is that, as an institution, and in each unit, we aspire to excellence in both endeavors.

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# Teaching Today and Tomorrow

by A. Susan Gay

When I decided to become a mathematics teacher, I had no idea that I would spend several years teaching sixth, seventh and eighth grade students. Many people believe this is the hardest age level to teach, but I have fond memories of my students and colleagues during that time. Though I left the middle school and moved to the Oklahoma State Department of Education, I continued to teach. Part of my job involved working with teachers of grades K-12 throughout the state on ways to improve their own teaching. Both experiences, especially teaching middle school mathematics, played a crucial role in the development of my style and philosophy of teaching.

I now hold a joint appointment in both the department of mathematics in the College and the department of teaching and leadership in the School of Education. Though I have taught calculus, most of my instructional assignments in the mathematics department have been classes taken by future teachers in elementary and middle schools. Similarly, in the School of Education, I have responsibility for the courses taken by future middle and high school mathematics teachers. So most of my current students will themselves be classroom teachers one day.

Many of my faculty colleagues face the same type of audience – a room full of future classroom teachers. We are keenly aware of our dual role and the extra responsibility it places upon us; not only do we teach content but we also serve as role models of how to teach. As a result, our students are watching, critiquing, and judging everything we say and do and how we do it. Also, they are deciding if our actions and statements fit with their own ideas of how they will teach in their future classrooms. The old adage that teachers teach as they were taught applies not only to teachers' experiences in grades K-12, but also to their experiences in university classrooms.

## The challenge of teaching

Teaching provides me an intellectual challenge as I try to find the best way to convey an idea or illustrate a strategy. Such challenges are present every

day, especially in a classroom full of future teachers who may themselves decide to model some aspect of my teaching style. At the beginning of a semester, I know that the new group of students is likely to be similar in some ways to students who have previously taken a course. As a teacher, though, part of the challenge is to determine what will work for this group so that each of them has the opportunity to learn and be successful.

As I try to meet the needs of each class of students, I use reflective thinking in different ways. Sometimes I focus my reflection on an entire class, thinking about their collective needs. For example, one class that I teach is taken by students between their student teaching experience and their internship experience in their final preparation to become middle and high school mathematics teachers. Each year this group has different needs because of their past experiences and new developments in the professional field. My job is to identify those needs and to plan a course that will best prepare the students to meet their teaching responsibilities at their internship site and in the first classroom they will call their own. For all of my classes, I continue to reflect in this way as the semester progresses, making changes when an activity did not go well, a lesson needs to be repeated or reinforced, or a new element needs to be added. Another type of reflection focuses on one or more individual students. Meeting individual students' needs is sometimes very difficult. I am especially concerned about the student who does not understand or who is not participating in class, and I try to identify something I can do which will be helpful. Reflective thinking focused on meeting students' needs helps me grow as a teacher because I am challenged to use new teaching strategies and find different ways to establish a good classroom environment.

## A few ideas on teaching strategies

I spend much time preparing to teach, searching for the right way to convey ideas through what I say, what I ask students to do in class, and what I assign students to do out of class. By being organized for

each class period, I maximize the class time that is spent productively. Further, being prepared conveys to students that I believe that teaching is important and that their learning is important.

Many of the strategies I use while teaching university courses are the same ones I used when I taught middle school mathematics. Students benefit from variety in classroom activities, so I try to mix lecture, small group work, and individual work on problems during the class period. This approach accomplishes several goals: the students are more involved in the lesson, various learning needs are met, and more individual attention is given to students. During lecture, I try to emphasize important connections to make the material meaningful and enhance learning. One very important connection is how the content will directly apply to the students' future responsibilities as teachers. I also point out relationships between the different topics we are studying so that students see how the concepts fit together.

One core teaching strategy that I use is questioning. Recently, a fellow teacher at the middle school where I taught reminded me that she used to watch me teach. She said that she focused her attention on the types of questions I asked and when I asked them. I still use questions frequently during any class period. I believe that this places more responsibility on the students to participate in the lesson in a way which enhances both their own and others' learning. A reaffirmation for me of the need for questioning in the university classroom came in a conversation I had with one of my students during my first semester at KU. He heard me talking about the questions I had asked in my calculus class, and he told me that in the mathematics classes he had taken at the college level, he had never heard a question from an instructor. This surprised me, and I realized that I would find it difficult to teach without questions, both those I ask students and those they ask me.

As I prepare an outline to teach a lesson, I include specific questions I will ask in the class period. During the class discussion, however, I also attempt to ask spontaneous questions that guide or reinforce students' thinking. Sometimes these impromptu questions are the best ones of all, but formulating good unplanned questions takes practice. These spontaneous questions and answers can provide some of the best learning moments because they are directly related to students' current understanding or misconception. Creating and using these opportunities to enhance learning is part of the challenge of teaching.

Another reason I try to ask lots of questions is to stimulate discovery learning. When students figure out concepts for themselves and draw their own conclusions, they have a richer and more meaningful learning experience. Posing the right question is often the starting point for such discoveries. Then my job is to guide and shape students' thinking until they reach an appropriate conclusion that demonstrates their understanding.

## Some thoughts on classroom environment

Many decisions a teacher makes will influence the feeling that is present in a classroom. A positive environment is fostered by mutual respect and a shared goal of learning. One simple practice that helps a teacher create such an environment is knowing students' names and using them during class. Using the names of our students during lessons or discussions can help individuals feel respected as important contributing members of the class. Another aspect of a positive classroom environment evolves from a shared goal to learn. In such a classroom, students feel the teacher is on their side, not an adversary who dares them to do well. Such teachers show confidence in their students and a willingness to be a guide and facilitator. As a teacher works with students, a spirit of cooperation along with high expectations can build students' confidence in their abilities.

I try to convey to my students that not only are their answers to my questions expected, but their questions are expected as well. Both questions and answers are valuable contributions to the learning that occurs in the class. A teacher's response to students' answers and questions can foster and encourage more participation or squelch it. The response to a student is especially important when a student asks or responds to a question with wrong information, because students find out if they can participate without being embarrassed if they are wrong. When students are willing to share their questions and wrong information, teachers can use these opportunities to correct misunderstandings which may be shared by other students in the class. I try to create a supportive classroom environment where such mistakes can be made and corrected.

In my classroom, I also use questions to build consensus or promote different patterns of thought, to elicit and extend students' thinking, and to challenge them to provide supporting arguments for their position. To do this, I must have a classroom environment

where each student feels safe and is willing to propose an idea or take a position that no one else has taken. My responses in these situations must reflect my respect for students' ideas and ways of thinking so that I show support for this risk-taking and encourage others to do the same.

## Teaching future teachers

Although the students in my classes are all currently planning careers in professional education, some students from all departments and majors will decide, after they leave the university, to pursue a teaching career. This is evidenced by my current students; they have undergraduate or graduate degrees in engineering, mathematics, business, economics, agronomy, history, political science, or English. Having pursued another field of study, they decided for one reason or another to become teachers. Still other current undergraduate students began their university work pursuing a different degree and then switched into professional education.

Students like these pervade universities; they are scattered throughout classes in every college, professional school, and degree program. As future teachers, they are influenced by the experiences they had as students throughout their lives. Some realize they are interested in teaching because they have been inspired by one or more teachers who demonstrated love of their subject, care for their students, or an ability to motivate others. These future teachers' methods of teaching are shaped by those teachers they have watched who promoted a desire and excitement for lifelong learning.

All university instructors influence students who may or may not know that teaching is the profession that awaits them. We all teach future teachers and we all serve as their role models.

In the past two years, two of my former middle school mathematics students have finished graduate programs at KU. Both of them are entering careers where they will be teaching; one has a doctorate in political science and the other has a master's degree in teaching English as a second language. Seeing them after almost 15 years reminded me again of the impact teachers have on their students. At the university, our influence as teachers shapes the future, especially through those students who become teachers themselves.

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