

Reflections

REFLECTIONS

from the Classroom

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



Published by the Center for Teaching Excellence

Volume 2

Fall 1999

Forward

Reflections from the Classroom is an annual publication to be shared and discussed among the university community. We hope you find this second volume informative. It represents a small collection of essays written by our colleagues from across our campuses. By reading what others have written about their teaching experiences, we are better positioned to reflect upon our own growth as teachers, and in many instances what we believe and how we approach our teaching will be reinforced. Yet, we may learn new and different ways to engage in the teaching and learning process. Several authors stated that writing these essays 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 than just discuss it. I thank those who contributed their viewpoints about teaching and learning and sincerely appreciate their sharing perspectives in this public forum. As a community of learners, we need to heighten our comfort level about sharing our experiences and perspectives of teaching and learning in a more consistent and meaningful manner. We hope *Reflections* is one step in that direction.

This volume begins with a white paper titled, “Undergraduate Research: Extending the Walls of the Classroom.” The intent of the white paper is to prompt a discussion among our colleagues on the implications of providing an undergraduate research experience for all of our students before they graduate from the University of Kansas. It offers no easy solutions, nor is it to be taken as a template that exhausts all the issues involved. The white paper does offer several thought-provoking implications for such a goal. Its intent is to move the discussion away from personal implications of such an initiative to a much broader dialogue among departments, programs, divisions, and schools across the university.

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, but rather they share insights and perspectives about what they have experienced, learned, and continue to learn about their practice of teaching.

We believe that through our collective wisdom and by sharing our experiences in classrooms, laboratories, and studios across our campuses, we can begin to better understand that improving teaching and learning is a never-ending process. As we share with each other through publications similar to this, and through formal and informal discussions about teaching and learning, we will truly create a culture that clearly reflects that teaching is central to the mission of the university.

Fred Rodriguez, Director
Center for Teaching Excellence

Cover designed by Judith Eddy, Program Assistant, CTE
Essays edited by Fred Rodriguez and Judith Eddy, CTE

Reflections from the Classroom

Volume 2

Fall 1999

Forward by Fred Rodriguez	i
Undergraduate Research: Extending the Walls of the Classroom	1
by Tim Bengtson, Journalism	
Alice Lieberman, Social Welfare	
K. Barbara Schowen, Chemistry/University Honors Program	
Fred Rodriguez, Center for Teaching Excellence	
Learning to Learn by John S. Brushwood	4
On Viewing the Campus as an Open Classroom, a Laboratory for Testing Knowledge, and a Public Forum for Ideas by Ted Johnson	6
A Passion for Teaching by Linda Stone-Ferrier	10
It's All New to My Students by Colin S. "Chip" Howat	12
Maturing as a Teacher by Anita L. Wingate	16

Undergraduate Research: Extending the Walls of the Classroom

A white paper by Tim Bengtson, Alice Lieberman,
K. Barbara Schowen, and Fred Rodriguez

In colleges and universities across the country, there is a conversation underway about the nature of academia and its future. The discussion reflects a subtle shift in our belief in the role of a university: where once the institution existed to provide instruction, it now exists to produce learning (Barr & Tagg, 1995). There is talk of institutions of higher education being transformed into learning communities. The University of Kansas has established a goal of becoming a premier learning community, as described by the Task Force Report on Initiative 2001, a plan initiated by Chancellor Robert E. Hemenway. Both the Chancellor and Task Force members were interested in how to make a KU education a more complete and enriching experience for undergraduate students.

In his speech at the 1998 Convocation on the Lawrence campus, Provost David E. Shulenburg suggested one way to expand undergraduate education was by extending the classroom walls. He said that “we must redesign our undergraduate programs so that every undergraduate student will undertake a research experience that is discipline appropriate.” He challenged faculty to revise matriculation experiences so that “100% [of students] have the same experience that the top 15% now receive” – specifically, more involvement in the process of inquiry.

We take this laudable goal as our starting point. KU is a Carnegie I Research University. Yet, do we understand how this distinction effects our undergraduates? We offer some questions that we hope will be discussed in depth by the university community.

- How does one define research? Is there a workable definition that can span the disciplines and professions at KU?
- Why should we offer research opportunities to our undergraduate students?
- Is it both educationally defensible and worth the effort, time, and resources to provide research opportunities for all students?

- How do some departments, divisions, or schools at KU provide research experiences now?
- What are some questions academic units should address as they consider ways for all their students to have a research experience before graduating?

Defining Research

A definition of research is articulated in inchoate form in several university documents. We take as our point of departure four of the eleven goals of general education, established in 1989 by the University’s Assessment Committee, which we believe address the research enterprise.

- 1: Increase ability to acquire, develop, and convey ideas and information through reading, writing, speaking, seeing, and listening.
- 8: Enhance capacity for critical thinking.
- 10: Increase capacity for innovative thinking.
- 11: Increase knowledge of methods used by scholars to explain phenomena in social sciences, humanities, mathematics, and natural sciences.

These goals reflect an underlying belief that a student’s undergraduate education is incomplete if it does not go beyond the classroom to include a more direct “experiencing of the major.” Optimally, this means some sort of original investigation by the student, leading to new knowledge, perhaps of publishable quality (or, in the arts, a work to be viewed or performed). Membership in a research team – if it requires the student to participate in the research process and learn about tools of inquiry relevant to his or her major – also meets this definition.

Ultimately, research must be *experienced*. It should require intellectual rigor and critical analysis and result in something new. This may range from a synthesis of others’ work to produce a new way of viewing that work, to the development of something entirely new: an artistic work, a field-based study, or original laboratory research.

The Value of Undergraduate Research

One major advantage of a research university is the opportunity for undergraduates to carry out research. Educators at research universities are positioned to provide a unique opportunity for undergraduate research. How can we capitalize on our potential to provide this meaningful experience? What would be an ideal research opportunity for undergraduates?

With respect to the last question, we confess our view of an ideal research effort in the academy is not original. Rather, it draws heavily on the ideas of a true original, Dr. Edwin Land, who before age 40 developed instant photography and contributed significantly to our country's espionage program. As noted by biographer Victor K. McElheny (1998) in *Insisting on the Impossible*, Dr. Land had strong opinions about the "right" form of college experience. Speaking to the faculty of the Massachusetts Institute of Technology, he observed, "if this is preparation for life . . . where in the world, where in the relationship with our colleagues, where in the industrial domain, where ever again, anywhere in life, is a person given this curious sequence of prepared talks and prepared questions, questions to which the answers are known?" The year: 1957.

In part as a result of this speech, MIT established the Undergraduate Research Opportunities Program (UROP), which enabled the institution to give more than 80% of its graduates a direct research experience. Forty years later, MIT's president called UROP "one of the strongest features of an MIT education."

Are the elements that make MIT's UROP successful transferable from a private institution with a student population of 10,000 to KU, a state institution with approximately 20,000 undergraduates? We believe several qualities in the MIT formula already exist at KU, and with renewed commitment they could be further strengthened to the advantage of our undergraduates and the university in general. Specifically, we have identified three factors:

Mentorship. Land referred to mentors as "ushers," but the idea is the same: provide students contact with faculty and graduate students in their discipline. These individuals can help undergraduates develop and sharpen their intellectual curiosity and skills to equip them to do research.

A collaborative experience. Collaborative learning occurs when students and faculty work together to create knowledge. This shared inquiry suggests knowledge is continuously evolving through dialogue.

Active participation. Students are actively engaged in research through question-framing, data collection,

analysis, synthesis, evaluation, and/or the reporting process endorsed by each discipline or profession.

A well-rounded and planned research experience benefits students in many ways: it enhances undergraduate education; empowers students to participate actively in their learning and to develop lifelong learning and professional skills; increases interactions between students and faculty in and out of classrooms; helps students explore career paths; allows students to gain a greater appreciation of their discipline; prepares them for what they may encounter in graduate school; and responds to the nationwide imperative to integrate research and education.

Establishing a Research Experience for All

A well-educated person knows more than the content of specific courses or a set of facts and methods. He or she is a person who knows how to learn, is able to think critically, can evaluate evidence, and can use the tools of his or her major. In part for this reason, we believe a student's undergraduate education is incomplete if it does not go beyond the classroom to include more direct experiences.

The authors of this paper asked colleagues what they do to provide research experiences for their undergraduate students and what they believed constituted a research experience. Results varied widely, but all were intellectually defensible within the parameters of these disciplines. For example, in natural sciences and engineering, a student may spend only a few hours a week in a lab, learning the culture and use of equipment and techniques, attending research-group meetings, perhaps helping a graduate student, and generally acting as a lab assistant. Some students enroll in departmental research or independent study courses and commit a significant amount of time to research. A small number of students (usually with prior research experience) who meet guidelines for departmental honors opt for a more intense experience, which includes writing a thesis and formally presenting results.

In the humanities, research experience may range from extensive papers written for upper-level classes to independent departmental honors research. Class-related papers can be genuine research projects, with the questions pursued related to the class, but are usually formulated by students with varying degrees of input from instructors. Typically, students create ideas for honors research projects. Projects are often pursued more independently than in the natural sciences and engineering, and more solitarily, although certainly with advice from a mentor.

The School of Social Welfare, like most professional schools, has adopted tools of the social sciences. From a cross-disciplinary perspective, Social Welfare draws from anthropology, with its rich tradition in grounded theory and field research, for evaluating clinical processes. In addition, it draws from sociology in teaching about and implementing large-scale research methods for evaluating social programs. Multimethod studies of psychological phenomena are also within the interest parameters of the field. Students currently take research courses that focus on becoming sophisticated consumers of published research, as well as attaining the skills required for evaluating their own practice.

The School of Journalism instructs students in the scientific method and its application in market tests and surveys. Students collect and analyze secondary and original data, and they use experimental methods to evaluate the efficacy of different message strategies. They create advertising and public relations campaigns. They research and write about news events on campus and in the community, which are published in the *University Daily Kansan*. They utilize research methods to evaluate content in the mass media. They create magazine articles for the *Jayhawk Journalist*. They also write and produce radio and TV stories and features to be aired locally or globally on the Internet.

As a final example, School of Education students are introduced to educational research and inquiry. In addition, undergraduates have multiple field-based experiences that apply subject content in a clinical experience with reflection and analysis as part of the process. Students in the fifth-year of the teacher training program are required to write, conduct, and present a research project as a culminating activity based on their teaching experience in the classroom.

Implications for KU

This white paper suggests that undergraduate research opportunities exist in various disciplines, either as specific requirements in the major or as other learning opportunities open to students interested in doing research. It also seems clear, however, that these opportunities are not systematic; they vary in quality; and they do not always meet the definition of research accepted by different disciplines. The goals, principles, and ideals of an undergraduate research experience are universal and can be adapted to all disciplines. If the KU academic community believes that providing research opportunities is, in fact, a goal we ought to pursue, then we have work to do. The authors of this paper engaged in a highly interactive exchange about this topic. Examining it

from different perspectives was enlightening. Perhaps that is where the true value of this experience lies, not reading a white paper, but rather discussing with colleagues what a research experience would really mean for a university like KU and the benefits of, as well as barriers to, making it happen for all undergraduates.

Questions that should be discussed with colleagues across campus are these:

- Is there a systematic way to ensure that every student earning an undergraduate degree from KU has engaged in a meaningful research experience?
- What is the perceived value of such an experience?
- How would we assess such an initiative?

With colleagues in our programs, departments, and schools, we should address these questions:

- How does our school or academic unit define a research experience for our undergraduate students? What percentage of undergraduate students engage in activities that meet this definition and expectation? How do we know?
- Can we define “research experience” more broadly? Might it include discipline-specific activities already undertaken by our students (for example, projects or papers of a clearly defined scope)? Can we incorporate more of these activities into our curriculum?
- If KU institutes a policy that all undergraduates must have a research experience, what does our unit need to do that would provide such an experience?
- Where do we begin to make research experiences a reality for our undergraduates? How will we know we have reached our goal of providing these for all?

The challenge of providing research opportunities for undergraduate students is before us. How we respond will either propel us toward becoming a true learning community or keep us locked in the past. At KU, we are exceptionally well positioned to offer all our students research experiences. Can we justify to KU’s constituency and to ourselves that only a select group is allowed to have this meaningful experience? The excitement of research and discovery should not be a frill or an exception, but an integral part of every undergraduate’s academic life. If we are to become a premier learning community, undergraduate research should be a benchmark of this goal. By reaching for it, we will extend the walls of our classrooms and make an undergraduate education at KU a complete and enriching experience.

References

- Barr, R. & Tagg, J. (1995) “From Teaching to Learning.” Nov/Dec *Change*.
- McElheny, V. (1998) *Insisting on the Impossible: The Life of Edwin Land*. Reading, MA: Perseus Books.

Learning to Learn

John S. Brushwood

Learning becomes the operative word, rather than *teaching*, as memory examines my more than half a century in the profession. Even Webster's *Collegiate* recognizes a certain indirection in this admirable undertaking: to teach is "to cause to know a subject." To *cause* to know; I would take this idea further and suggest that what we call "teaching" is, at its best, showing how to learn.

Throughout my experiences as a student, the professors who showed me how to learn, by example of their own continued learning, are the ones who taught me valuable lessons. It is only fair to note that I also remember professors who showed me how not to learn, and they were not considered inadequate teachers. The deficiency for this student was that they depended too much on enthusiasm, not enough on recently acquired knowledge. Fredson Bowers, long ago at the University of Virginia, called it "appreciation" teaching. Unquestionably, the act of teaching how to learn was important in my formation and also in my practice of the profession.

Of course, the meaning and the use of this neat little phrase, "showing how to learn," have not accompanied me throughout my career. The idea has acquired specific form only in the past decade, but memory informs me that it was long gestating. I see it now as I think back over the changes in my classroom procedures and also in the directions taken by my own learning.

Teaching a foreign language makes you aware of audience response as few things will. Dialogue is essential. I learned that, many years ago, from a beginning Spanish class made up of ex-GIs. They had questions, and they wanted answers. They also wanted to make a statement or two. So I became a good teacher, a product of good students. This awareness of the need to question, answer, and share ideas carried over into my literature classes, but not without some trial and error.

I still have in my files the copious notes I made for lectures to my first class in Spanish-American literature. My plan, at that time, was to lecture during two class periods and use the third to discuss assigned

readings. Not a bad idea, but over time, the pattern changed so that each class period began with my exposition of the context in which our reading should be placed, with the rest of the period given to discussion of the selections read. My lectures – or better, expositions, as it turned out – were more useful to the students after I started outlining them on the black(green)board before or while I talked. This procedure was borrowed from a professor with whom I had studied at Columbia University. Later, with the advent of the word processor and printer, it evolved into a handout that could be updated conveniently and, for many students, served as the basis for notetaking.

Updating became very important to me. I can remember that those very carefully prepared lecture notes served for exactly one full session. When I first made them, I probably thought that they would be good for at least several years. No, that's not the way it worked out. I decided that my own learning had to be apparent. The course was different each time it was offered, and even for courses that I taught many times, I found it useful to read something new and relevant to each session. Students were interested in what I was reading, in what changes I had made, and especially in ideas that I considered still provisional. I've found out, very recently in retirement years, that some students were favorably impressed by my willingness to acknowledge my inability to answer some of their questions.

As I became increasingly aware of the need to update, I also recognized that changes in my ideas and explications were not solely the result of my own investigation; I was reading published results of other professionals' learning, usually called "research" in university circles. I was learning from them, and so were my students. To use that very slippery word that continues to bother me, these colleagues in other institutions were "teaching" us via their publications. It seemed reasonable, even obligatory, that I should do my part by publishing results of my own research. More questions and answers, now in dialogue with colleagues involved in projects similar to my own.

Just as my classroom procedure evolved on the basis of questions students asked me, so the direction of my continued learning was determined by questions from students and colleagues. An early book about narrative literature in Mexico evoked questions about literature and society. A study of this relationship in a particular period of time raised the possibility of a comprehensive study. A seminar in Mexican fiction encouraged students to ask questions about other national literatures, and so on to further learning from and with scholars in and out of class.

I learned also that my teaching was enhanced by association with colleagues in my own university. In addition to the learning/teaching that goes on constantly in a department where the exchange of ideas and information is the norm, co-teaching with other professors showed me a lot about their classroom procedures and also contributed to learning in my own special field. The contacts were many; I remember vividly the day Ed Ruhe appeared at my office door, showed me a copy of Barthes' *S/Z*, and assured me it was the most exciting event in literary analysis since Northrup Frye. That moment was the beginning of numerous adjustments in my learning and, consequently, in what my students learned and what I learned from them. It is important to note that, several years earlier, I had participated in a multi-teacher course organized by Ed, and we continued to exchange ideas and information. This incident is one of dozens that I might recall, but I shall not do so for fear of omitting some important ones. The point is to show I found teaching to be an extensive activity, not limited to the classroom and student-professor conferences.

A career of learning has included an ever deeper sensitivity to the variety of readings or understandings of what is said. I refer to the glories and deficiencies of language. Learning/teaching has taught me that any utterance, spoken or written, will be understood in the context of each listener's/reader's repertory – what each individual has experienced or learned in any way. Mention of this awareness circles back to the statement about audience response, made near the beginning of these observations. Literature, and probably all other means of communication, expand in meaning through analysis. When one reader discusses a literary work with another, the repertoires of both expand, sensitivity deepens, and knowledge increases. This fact is the basis of classroom procedure that I have found effective. Obviously, it is important outside the classroom as well.

Throughout this essay, it must be apparent that I have problems with the vocabulary related to my profession. Some clarification may be useful. I take it that learning, not teaching, is the basic act in education. I have been known to say that there is no such thing as teaching, there is only learning. This assertion may overstate the case, and I have no desire to rob the language of a useful word that probably refers, most conveniently, to classroom procedure. It is well to remember, however, that students are shown how to learn, and their learning, in turn, triggers further learning on the part of the professor.

I have some qualms about the emphasis on teaching rather than learning. I fear it may cause people to think of education as a consumer staple. They may believe that if some individuals pay their tuition, then sit passively in a room while a "good teacher" explains a subject, some kind of magical transfer takes place and the students will be forever in control of the material explained. I don't believe it. I do believe that the professor must not simply show what he or she has accomplished in the past, but rather what is current in his or her research. By sharing the process and result of our own learning, we show our students how to learn, drawing them into a lifetime of discovering questions and answers, sharing ideas – in short, learning.

John S. Brushwood is Roberts professor emeritus of Latin-American literature in the department of Spanish & Portuguese. He joined the KU faculty in 1967 and retired in 1990.

On Viewing the Campus as an Open Classroom, a Laboratory for Testing Knowledge, and a Public Forum for Ideas

Ted Johnson

“Our youth will dwell in a land of health
and fair sights and sounds.”

-- Plato

On entering Twente Hall on the campus of the University of Kansas, one passes immediately by a bronze plaque setting forth in raised letters a quotation from Plato: "Our youth will dwell in a land of health and fair sights and sounds." The fair sights of the buildings and landscaping of Mount Oread, and the fair sounds of lively discussions, give the campus of the University of Kansas the aspect of both the grove of the Academy and the Acropolis of ancient Athens. In the spirit of the Socratic dialogues that took place at times in the shade of a plane tree and that Plato later set down, and the peripatetic teaching of Aristotle in the Lyceum, students and I have discovered over the years extraordinary insights through viewing the campus as an open classroom, a laboratory for trying out heuristic hypotheses and testing knowledge, and a public forum or agora for the free and open circulation of ideas.

The Greek noun *idea* and verb *idein* have in common *seeing*. As we move by architecture and natural growth on the campus, what do we see, *literally*? In terms of classical exegesis, after the literal, what moral, allegorical, and anagogical senses might we come to know as "fair sights" in the ideal realm of intellectual forms? The architecture, landscaping, monuments, and sculptures (stone bas-reliefs of *Hermes, Saint George and the Dragon*, and numerous Jayhawks, the granite marker of the *Site of Barracks and Trenches, 1863*, and bronze sculptures of *The Pioneer, 1856* and *Prairie Formation, 1981*), near Plato's text constitute one of the many intellectually beautiful introductions to our academic acropolis.

An aphorism in our profession runs: "Teaching and learning are simultaneous activities; one cannot have the one without the other." And while the letter of the discipline we profess may remain much the same over the years, the spirit of our subject, and how

we might bring students to discover and kindle within themselves that spirit, grows increasingly important and exciting, even urgent. Students and I have discovered that the letter and spirit of the subjects we are examining – the interrelations of humanities and arts in courses conducted in English or French – are best explored when we move freely about the campus to this or that *locus amoenus* where architecture, museums, and nature might best quicken, illustrate, test, and support our intellectual inquiries.

At the outset of my career, I stood and lectured to students seated in a classroom. I first taught as a student Fulbright *lecteur américain* at the Université de Poitiers, France. Upon completing doctoral work in French literature and art history at the University of Wisconsin, I lectured on French literature and conducted literature preceptorials and undergraduate seminars on the interrelations of literature and the arts as an assistant professor of French at Princeton. I have lectured on modern French literature and the interrelations of the humanities and other arts as associate professor and then professor of French at the University of Kansas. But early on, and increasingly, discussions displaced lectures. How thrilling to allow students to discover, and then profess with infectious enthusiasm, their ideas. At any moment in a conversation turning among a dozen students and an instructor, several hundred years of experience come into play. Why not draw on these? And whereas I began my career professing ideas now, towards its close, I have become, as Socrates expressed in the *Theaetetus*, "a mid-wife of ideas," eager for students to profess. Any mentor who has assisted in the birth of ideas knows that most beautiful moment when everything about a person quickens, eyes shine, and an idea, fresh and thrilling, comes tumbling out joyously into the world.

Years ago a questionnaire asked us to set down our philosophy of teaching in the space of a paragraph. I finally managed to condense my teaching philosophy into three short sentences that I later discovered figure in military recruitment posters: "Be. Become. Become all you can be." In keeping with this philosophy, the following phrase often appears in the syllabus of a variety of courses I conduct: "The aim of this course, through the study of [. . .] is to allow the student to develop an individual, authentic, and authoritative voice."

The traditional classroom is essential for certain classes I teach, such as French 300, "Intensive Review of French Grammar," the first course beyond the proficiency sequence. Before each class begins, students write out in chalk, covering a room-length board, their translations into French of English sentences. During class we discuss grammar while I correct and gloss their work in white chalk. The gentle gracefulness of writing out phrases with chalk dancing over a slate-like surface or correcting mistakes with a chalk mark or the light touch of an eraser can never be achieved with harsh, brightly colored magic markers pressing firmly on an off-white shiny surface, or digitally controlled electronic ciphers eliminating ciphers on individual screens. We find the discussion of literature extremely difficult in small, windowless rooms; large rooms with windows allow changing natural light to keep our discussions reasonable and in focus with the non-negotiable realities of our world.

For other courses I conduct, such as advanced French conversation, French culture, the humanities and Western civilization course "The Interrelations of the Humanities and the Arts," and the freshman honors tutorial and a tutorial in the liberal arts and sciences dealing with "Composition," students and I have found the KU campus to be an extraordinary classroom, laboratory, and forum.

Developing the Deep Gaze

Over the years, several wonderful opportunities brought me to the realization that one could use the campus as classroom and laboratory. I participated in the extraordinary program "The Humanist in the Art Museum" organized by Marilyn Stokstad which coincided with the installation of the new Helen Foresman Spencer Museum of Art. One morning, Chu-T'sing Li brought us to consider the "untrammelled" in art. Another day Dolo Brooking, director of museum education, brought us to tease ideas out of a work of art

through the inquiry method. A watershed experience in my life. We gathered around a small eighteenth century marble sculpture of the Magdalene sprawled out on rocks, and Dolo asked, "Is she comfortable?" The ideas I articulated in response to the sculpture because of her question were of such a nature that afterwards, one of my colleagues remarked, "Wow, you really got into that piece!" And I really had. Her simple question allowed me to see freshly and bring into focus ideas I generated for the first time. This experience of being a student during an epiphanic moment brought about by maieutic pedagogy and that results in what the Greeks called *ekphrasis*, or teasing phrases out of art, has informed my teaching since that insightful morning.

An intra-university visiting professorship in classics and music allowed me to begin to learn Greek in a first-year Greek class with Michael Shaw, explore further mythology in a class taught by Oliver Philips, study music theory in introductory courses with Albert Gerken, and begin to play the piano through lessons with a master teacher, Jan Shumway.

I explored *analogy* and *metaphor* that year, the interrelations of the seven liberal arts that developed in ancient Greece and form the basis of the medieval university curriculum: the trivium with grammar, rhetoric, and dialectic (bachelor of arts), and the quadrivium with geometry, arithmetic, music, and astronomy (master of arts) and how the University of Kansas continues this tradition. Upon entering the Spencer Museum of Art (how similar to the Propylaea on the Acropolis), the first works one sees are two large, oval, eighteenth century paintings of *The Muse of Music* and *The Muse of Astronomy*. Architectural drawings for Strong Hall include bas-reliefs of various muses and philosophy in the rectangle above the entrance.

By the end of the first week of classes in the fall term I was able to walk up Mount Oread, survey the buildings, and utter sentences in classical Greek such as "How beautiful is the Acropolis" and "How beautiful is the Parthenon." Indeed, the buildings on the plane of Mount Oread rise up chthonically and mark out time like the temples on the Acropolis in Greece. We also mark out time. Before the ionic portico of the former Law School, like two columns supporting an intellectual pediment, student and mentor in the bronze sculpture group by Daniel Chester French are engaged in a Socratic dialogue. The robust student, *mens sana in corpore sano*, two well-read books under

his arm, looks eye to eye with his mentor and towards the rising sun while the mentor, teasing out the spirit from texts in the books and the mind of the student at his side, faces the setting sun. At the western entrance to Mount Oread, bronze bas-relief panels forming the Chi Omega fountain illustrate the myth of Persephone and Demeter with references to Hades, Hermes, wheat, pomegranates, and the cycles of life. Nearby, a wall of a simple sanctuary to the memory of students who died in combat bears the inscription: "Lest we forget the courage, honor and sacrifice of our fellow students." At the eastern entrance next to Spooner, in the Weaver Court, four large, heavy rocks used to float in the rectangular pool where a fountain, splashing like the sound of a bath being drawn, recalled the moment of insight when Archimedes cried out "Eureka!"

A sabbatical during the spring of 1991 allowed me to put into practice the experiences of being a humanist in the art museum and the idea that there was little difference between the classical University of Athens (from Plato's establishment of the Academy as early as 385 B.C.E. and its dissolution by Justinian in 529 C.E) and the University of Kansas. Might one continue the spirit of Socrates, Plato, and Aristotle by moving peripatetically over the acropolis and entering into dialogues with students and professors?

Dressed in my suit and carrying a somewhat hefty briefcase I never set down, I gave the impression that I was on the verge of going to, or had just come from, an important meeting. I would amble about the university and talk with whomever for as long as my interlocutors cared. What extraordinary conversations and thrilling experiences! It's one thing to read and imagine the Socratic dialogues; it's another to be engaged in them, now in a tree's dappled shade, now in the sharp and ever moving shadows projected by architecture. At times the cast of the day would change or our shadows would have lengthened considerably since our conversation began. Once by a library, we watched a vapor trail move into, bisect, then leave a sunbow around the sun as we disserted on the arcs, lines, and circles that constitute the Greek and Latin alphabets. We admired at close range the graceful walk of the State reptile, *terrapene ornata*, while humming Saint-Saëns' interpretation of the *galop* by Offenbach, and on Wescoe Beach student potters enthusiastically taught me about their art that goes back 26,000 years.

Quickening the Deep Gaze

Over the years, students and I have examined ephemeral phenomena along Jayhawk Boulevard: a dead young redbud tree painted gardener's green; mulched fire hydrants, stop signs, and buildings; tulips pushing through chicken wire to bloom crimson in the blue; the term "Wescoe Beach"; our fleeting reflections in the 3.7 billion year-old gneiss on Fraser; and the pancakes that mysteriously appear in trees during the night between Carnival and Lent and occasionally hang from the statue of Jimmy Green and student. Each Stop day in the spring term, I conduct a daylong leisurely walking tour of campus so students, faculty, staff, and townspeople can discover for themselves the beautiful ideas that grow so naturally on Mount Oread. We discuss interrelations of architecture, iconography, and ideas through analysis of the glass pyramid of the Anschutz Science Library, the ionic portico of the former Law school, and the romanesque revival façades and iconography of Stauffer-Flint, Spooner, and the Natural History Museum. Each equinox students, faculty, and townspeople gather at the intersection of 14th Street and Jayhawk Boulevard to observe the orientation of certain buildings in relation to Polaris, our current polestar, and the rising sun. A number of buildings on the eastern side of the campus are oriented towards the rising sun at equinox, like churches in France from the eleventh to sixteenth centuries. Thus upon emerging from the oriented college gothic nave of Watson Library any time of year, one confronts the North Star whose light, at the writing of this essay at the end of the second millennium, left that sun between the final years of Galileo's house arrest and his death.

Students deserve to study firsthand original works of art, not reproductions. And thus we examine and discuss, in English or in French, paintings, sculptures, objects, prints, and furniture in the Helen Foresman Spencer Museum of Art, manuscripts and rare books in the Kenneth Spencer Research Library, and plaster casts of Greek and Roman sculptures in the Wilcox Classical Museum. For certain courses, students draw the eastern façade of the Natural History Museum or paintings in the Spencer Museum of Art, daunting projects, but extremely valuable in learning to see deeply into art.

Students enjoy viewing the campus as classroom, laboratory, and public forum, learning to "read-in-between" intelligently (Latin *inte* + *legere*, to gather,

to select). We examine the interrelations between mortar and building, ideas and the academic mortar-board. Extraordinary term papers have come from the juxtaposition of the physical realities of the campus and ideas, such as negative space by a business major or *in vitro* fertilization and art by a science major. Students have interpreted and played the music in *The Muse of Music*; choreographed and danced an interpretation of Hébert's bronze sculpture *Et toujours et jamais*; written poems in Latin about medieval sculptures, set them to music, and then sung them, accompanied by several musicians, for the class. One freshman pulled the whole world out of a glass vase, and another considered the atomic structure of the universe both in ourselves and distant galaxies as implied in a contemporary sculpture.

One spring morning during an almost total solar eclipse, we discussed the iconography of the sun and moon on the façade of the Natural History Museum while the temperature dropped and crescent shapes appeared under the trees. Students have performed original plays along Wescoe Beach, read original poetry under trees, read selections from Hesiod's *Theogony*, *Works and Days* and the *Homeric Hymns* within the resonant portico of Anschutz Science Library, and read *Anabasis* by Saint-John Perse overlooking the Prairie Acre. We observed a parhelion come into being on a vapor trail, then disappear when the wind blew the trail away from the position where the effect could occur; by a London plane tree in front of Wescoe Hall, a red-tailed hawk kettled over our heads as we discussed the interrelations of the liberal arts; and we all remember the butterfly that circled the class and landed on a student's head for the duration of her presentation of her paper at the Chi Omega fountain.

Sharing the Deep Gaze

Over the years a number of wonderful colleagues have shared the letter and spirit of their disciplines with classes I was conducting. Since a review of these decades of collaboration, such as the interdisciplinary course "1913" Jeanne Stump and I orchestrated, constitutes an essay unto itself, I shall set down here, as representative example, the humanities and Western civilization course "The Interrelations of the Humanities and the Arts" I conducted last fall. Anthony Corbeill, classics, demonstrated and explained gestures in antiquity. In Malott Hall, Stephen Shawl, astronomy, prepared us for our nocturnal field trip over campus at the fall equinox

and presented (since 54% of Americans think the sun goes around the earth) the ancient Ptolemaic system that informed the Middle Ages. In Bales Recital Hall, Peter Thompson, fine arts, showed how he designed the stained glass windows and organ case using the golden rectangle of the Greeks and the Fibonacci number series, forms and sequences found in nature. James Higdon, music, played a dramatic toccata on the organ and demonstrated the capabilities of the instrument built for this space. With Joan Stone, dance, we experienced how dance, architecture, and landscape interrelated during the Renaissance by performing period dances: in the wall of mirrors of the studio, we saw ourselves dancing a stately pavane with the *colline* of Tuscany and leaping into the air in galliards, sets of which Queen Elizabeth did for exercise each morning. Linda Samson Tailleur, design, discussed the art of papermaking, printing, and book-making using her own work and Renaissance and modern books from the collection of the Spencer Research Library.

I look back fondly on those occasions of free, joyous, and above all playful explorations of ideas with colleagues: heuristic dialogues in the Art Museum with Bob Findlay; a marathon reading of *Moby Dick* organized by Beth Schultz, and then several weeks later during the noon faculty-staff swim hour in the deep end of the university pool, our analysis of the sounds whales make and how water transmits them, all under the bemused watch of the life-guard who nonetheless required that we swim in laps; marathon readings of *The Illiad* and *The Odyssey* (through welling tears, I read the first five lines of my chapter in Greek, haltingly, and with the earnest focus of a first-grader, into a microphone on Wescoe Beach!); the duet in the form of a performance piece *Moving Mountains* with Marsha Paludan and her movement class; and the mirthful conversations with colleagues and staff around the campus whose healthy, intelligent, and inimitable genius daily assures me that we all really do dwell in a land of health and fair sights and sounds.

Ted Johnson is a professor of French in the department of French & Italian. He also teaches interdisciplinary courses in humanities and Western civilization, the honors program, and liberal arts and sciences. He has taught at KU for 31 years.

A Passion for Teaching

Linda Stone–Ferrier

After trying for several months to write this essay, I realized just how personal teaching is. For quite a while I could not understand why it was so difficult to articulate my thoughts about teaching, because to me they are clear, deeply–felt, and sincere. I have finally discovered, however, that the very intensity of my passion for teaching harbors, by definition, feelings that are difficult to share in public. I also assume that the innumerable outstanding teachers at KU have their own personal passions about teaching.

Through writing this essay, I have also come to understand that, for me, the joy of teaching is a marriage of the excitement that the discipline of art history holds for me and the enormous pleasure that I experience sharing my excitement with students at all levels. Importantly, I have discovered that teaching’s pleasures include mentoring my students every day in every way possible: encouraging them, applauding small and large accomplishments, enthusiastically nominating them for scholarships and awards for academic excellence and graduate student teaching, initiating unsolicited recommendations for internships and other positions, letting them know how happy I am to see them, and sharing with them the joys of learning, questioning, analyzing, and honing critical thinking and writing skills. I cannot imagine a greater intellectual or emotional high.

I have always wanted to be a teacher, even though I had mixed experiences as a student with teachers I have had. Although Miss Simpson and Mrs. Bennett in fourth and fifth grade were nurturing and creative, and Mr. Okazaki in seventh grade was the most inspiring and exhilarating teacher I have ever had, Mr. Graessle in ninth–grade Algebra I and Mr. Barton in twelfth–grade chemistry were absolutely terrifying. Mr. Graessle paralyzed the class with fear as he swatted chewing gum off the ceiling tiles, enraged at the very idea that one of us had thrown gum wads up there. Mr. Barton made mincemeat of me in public for being the only graduating senior in my high school class of 650 in politically conservative San Diego who had the audacity and foolishness in the late 1960s to plan matriculation at the University of California, Berkeley.

From such teaching models, I have remembered how to treat and *not* treat students.

I don’t know whether my self–imposed predestination to be a teacher was determined by the idea in the 1950s and 1960s that teaching was the appropriate profession to which girls should aspire, if they aspired at all to a profession, or whether I wanted to be a teacher because I enjoyed school so much, or whether the respect I had for my parents who were teachers determined my fate/fortune. Although my father was a professor, it never occurred to me that teaching at the university level was an option for me until I was well into graduate school. And my path to graduate school was a winding one.

During my undergraduate junior year, I literally stumbled upon the history of art while enrolled in a study–abroad program as an English major at the University of Edinburgh, Scotland. When I returned to UC Berkeley for my senior year, I declared a double major in English literature and art history, because I was close to finishing the former and addicted to the latter. Lacking the confidence to imagine finishing a graduate degree, but filled with an insatiable desire for more art history courses, I began graduate school at UC Berkeley. After I had had a taste of teaching art history as a graduate teaching assistant, I knew I had quite serendipitously found the most wonderful career path imaginable. I have always been grateful for that twist of fate in Edinburgh.

Although my area of specialization is seventeenth–century Dutch and Flemish art (Rembrandt, Vermeer, Rubens, and friends), my teaching interests include much more. I find that the two–semester freshman/sophomore introductory course (ancient through modern art) can be as intellectually stimulating and as professionally gratifying as teaching an upper–level specialized lecture course or a graduate seminar in my own area of expertise. Until I became department chair, I taught it annually. The course offers unique teaching challenges because it is a large lecture course (150 – 250 students) required by the School of Fine Arts, yet other students also elect to enroll. The mixed student body includes an array of backgrounds,

abilities, attitudes, and ranges of visual sensitivity and verbal sophistication. I enjoy teaching it for three reasons: 1. It is essential to see the larger picture in which my area of expertise is but a part, allowing me to raise new questions when I return to the familiar; 2. It is vital never to lose sight of the learning process through which pass undeclared undergraduates, art history majors, and graduate students in art history; and 3. I love to share with introductory students their excitement as they discover art history.

My philosophy of teaching stems from the nature of art history as a discipline and from ideas about how any learning should be approached. First, art history offers unique learning opportunities because of its emphasis on the object and its interdisciplinary nature. As much as possible I emphasize hands-on experience with works in the Spencer Museum of Art at KU and the Nelson-Atkins Museum in Kansas City. Students study works of art as objects with aesthetic properties and values, as well as the larger context of the culture in which they were produced. I also encourage students to appreciate cultural values and world views of times and places other than their own. I find the latter crucial because so many of our students have never been outside the Midwest. In numerous ways I try to make material and concepts relevant to their own lives (How is Calvin Klein's clothing workshop like the painting workshop of Peter Paul Rubens? Why did the pop star Michael Jackson commission a portrait of himself in the artistic style and mode of Anthony van Dyck's portraiture?).

For students to understand lessons taught by art history, my teaching has various goals. I aim at all times – in the classroom and in written assignments – to challenge my students to think critically and to express themselves clearly in their spoken and written work. I push them to question the assumptions and conclusions of the authors of their readings, as well as my own. I also encourage dialogue in *all* my classes and seminars, asking questions to stimulate students to think for themselves and to dispel passivity that may have been created by the anonymity of a large class. I have found any topic can be invigorated, even if only to ask, “*Why* is this boring?” when I notice students are less than interested in a discussion. Exploring why a subject is not engaging immediately makes it fascinating. I also encourage students to ask questions in class. When I do not know the answer, I bring one back to class as soon as possible. To further engage students and show them I care, I learn their names in courses where enrollment is not prohibitively large.

I remember well what it felt like to be a graduate student – certainly an experience that marks one for life, hopefully for the better. Therefore, I have always felt a deep kinship or partnership with – and I should also say empathy for – graduate students. I feel as though we are “in this together” when it comes to a graduate seminar, research paper, or comprehensive exam, and the mutual discovery has been thrilling. I have learned from graduate students at least as much as they have learned from me. They provide me good counsel, feedback, and much-appreciated support.

After 19 years of teaching graduate students, I still find the study of seventeenth-century Dutch and Flemish art exciting, and I love experiencing graduate students being bitten by the northern baroque art history bug, as it were. With this group, I share my belief that there is no substitute for excellence. That is why I am happy to spend time with students who ask me to critique their written and oral work. It is inspiring to see their skills mature into something splendid. At the same time, it is tremendously gratifying to watch my students persevere when the going gets tough – and one thing graduate school can promise is that eventually it gets tough.

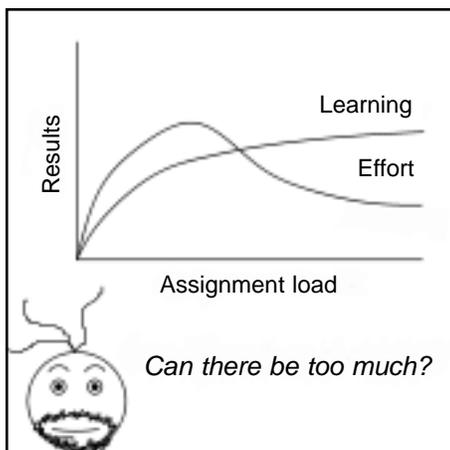
Finally, for me good teaching means not taking myself too seriously, yet establishing a high level of mutual respect for the learning experience in and out of the classroom; having a shared sense of humor while denigrating no one; being a knowledgeable and enthusiastic speaker, as well as a good listener; and being empathetic and patient by remembering well what it was like to be a student. I feel a tremendous connection with and attachment to my students, in general, and to my graduate students, in particular, who feel like an extended family to me. They have enriched my life professionally and personally through what they have taught and given to me. I am gratified to be able to reciprocate. I cherish the opportunity to nurture, teach, and encourage them to grow intellectually and professionally. I look forward to life-long reunions with this extended family to whom I will always feel related and about whom I will always feel passionate.

Linda Stone-Ferrier is professor and chair of the Kress Foundation department of art history. Currently, she teaches courses in northern baroque art and graduate seminars on seventeenth century Dutch and Flemish art. She has taught at KU for 19 years.

It's All New to My Students

Colin S. "Chip" Howat

Chemical engineering touches all of our lives from fuels, pharmaceuticals, electronics, chemicals, and household products to metals, ceramics, and polymers. It's an expanding field with knowledge being created at a frightening rate in both traditional and new fields where chemical engineers ply their wares. Learning, teaching effectiveness, and society are compromised if all cutting edge material is added to the zero-sum-game of student effort and time. Student background upon arrival at the university has advanced little, if at all. The instructor's escape from



this trap is to recognize and envelop the philosophy that those chemical engineering skills to be taught are all new to the new crop of students advancing each year. Wholesale additions without recognition of the

commonality of skills required to practice in all these fields leads to ineffective instruction, ineffective learning, and poorer graduates. It's all new to students.

We, as a public, accept risk in our daily lives. For these purposes, risk is the product of an event consequence and the event probability. Examples of event consequence are injury, loss, or environmental damage. Walking across a street has the consequence of injury should a passing car hit us. Oftentimes, we could cross the street safely; i.e. the probability of the event of being hit is low. But, the consequence is high. Although there is high risk, it is at a level we are willing to accept. Sports, street crossings, driving, and flying are all examples of daily activities that put us at risk. While we willingly accept self-imposed risk, we are justifiably uncomfortable with someone else subjecting us to risk without our consent.

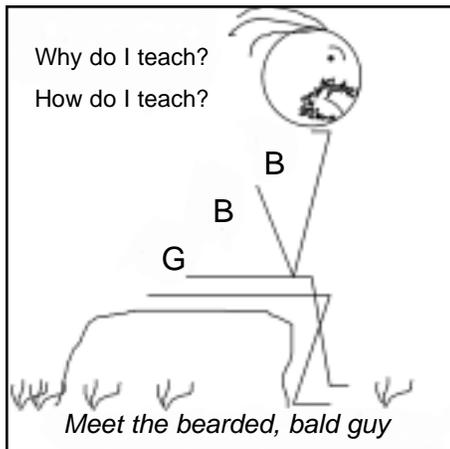
Chemical processing with the intent of making products beneficial to society subjects society to risk. It is the chemical engineer's responsibility to hold the public's safety paramount by minimizing risk.

In 1984, an unsuspecting, trusting public was at risk because of a multinational corporation's actions. While thousands slept, a toxic chemical was released exposing them, their livestock, and the surrounding environment to considerable harm. This chemical plant was like many throughout the world. It manufactured and used an intermediate, hazardous substance seemingly necessary for the manufacture of the end product. The latter is a benefit to society. The risk was well known to plant designers, operators, and managers. Safety systems were in place to minimize risk to the public. A restatement of Murphy's Law is "*Anything that can go wrong usually goes right.*" Sometimes, an improbable alignment of decisions and failures or an unforeseen combination of events results in an event. If the consequences are high, the risk is high even if the probability is low. Because of a series of poor engineering decisions and a failure to interpret properly the operating data, the toxic chemical was released. Thousands died during that night and many thousands more were harmed.

Process design, plant and environmental safety, and information interpretation are the lines of defense between chemical processes that society relies upon and public exposure to which society rightly objects. Exposure can be the aforementioned toxic release, an environmental contamination, explosion, or fire. Chemical engineers design, control, and operate the processes, producing chemicals for the benefit of society. They are responsible for the safety of the public.

I teach senior-level chemical process design, plant and environmental safety, and chemical plant performance analysis. My goal is to train engineers to practice effectively. I help undergraduate students become the most effective chemical engineers their talents and desires will allow them to be while always holding paramount the public safety. I can think of no greater contribution that I can make.

Chemical engineering is a problem solving profession. We use the forces of nature to transform raw materials into useful products for society. This must



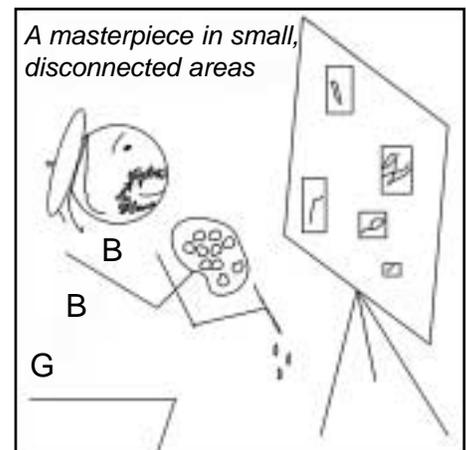
be done elegantly, economically, efficiently, and safely. It requires us to bring an understanding of natural and engineering sciences and skills to use that knowledge to bear on the synthesis and evaluation of solutions to significant engineering and societal problems. Chemical engineers are expected to practice with the goal of minimizing risk to society. Risk is reduced by minimizing the probability that an initiating event will occur; maximizing the probability that it will terminate benignly should it occur; and, should it not terminate benignly, minimizing the consequence to the public, plant personnel, the environment, and the plant. Chemical engineers do this using uncertain information with judgement and restraint. They rarely solve the same problem twice. They are perpetually confronted with new problems, constraints, and situations – many have high risk that must be reduced. It's as if they are constantly expected to map new terrain with unknown obstacles and limits that will inhibit their progress. Graduating engineers are expected to practice effectively immediately upon graduation. Therefore, their education must emulate their expected practice.

Engineering and science education prior to the senior year is anything but characteristic of practice. The education experience is compartmentalized and information is presented as if it were certain. Classes are taught within tight boundaries of information with few connections to other subjects. The material presented in texts is presented as if it is well known and certain. The teaching emphasis is on procedures, prescriptions. Rarely are students asked to synthesize and evaluate. Rarely are they asked to examine the impact of their work beyond the problem at hand. Rarely are they asked to examine a solution beyond constraints of desired performance. Rarely are problems even within the confines of a particular subject

reflective of the complexity that they will face upon graduation. Rarely is their course experience representative of practice. Students are taught prescriptions with little interconnectedness between subjects, ideas, and solutions. By way of analogy, students are taught as an artist might approach a canvas to paint disjointed, disconnected areas with no intended, synthetic, or meaningful connection among the areas. It would be very difficult to gain perspective of what the artist was trying to accomplish. It is very difficult for students to gain perspective.

Some students successfully learn within this environment, but they must transform themselves if they are to practice effectively.

My interest and goal is to transform our students from prescriptive, compartmentalized, unquestioning students into practicing engineers. I structure my classes in design and safety with the emphasis on their making the decisions. They must decide what the real problem is, they must decide what is known and needs to be known, they must synthesize a solution and plan steps required to achieve it, they must evaluate their work and decide what is sufficient. They cannot merely examine it within the narrow confines of the problem at hand, but also within the context of an entire plant and its impact on the public,



plant personnel, the environment, and the plant. They cannot merely examine within the context of desired performance as if the information were certain and the operation were accurate, but also they must evaluate their decisions given the uncertainties, possible excursions, and possible societal impact. They must look beyond the confines of the chainlink fence that surrounds chemical processing facilities. In short, I structure my classes to decompartmentalize their knowledge to give them the confidence to practice in the milieu of uncertainty and recognize their responsibilities to themselves, their families, their colleagues, society, and the environment. Students must recognize the risk in their practice and

strive to minimize it while still improving society's living standards. They must work with the entire canvas of chemical engineering information and skills.

This teaching responsibility and my subsequent approach is a poor fit within the constraints of typical textbook settings. Therefore, I don't use them.

Once I define the actual objectives for the semester and the general structure upon which we will achieve them, the students actually define the path, assemble the steps that will be followed, and evaluate the progress toward meeting the objectives. This necessarily leads to false starts, backtracking, redefinition, and new directions. They must teach themselves to practice. They must convince themselves that they can hypothesize solutions, evaluate them, learn from their mistakes, and move forward. I must flexibly present material and sequence to meet their needs. I must alter assignments, due dates, and goals depending upon their path, skills, and weaknesses. I teach from my personal notes with citations to a variety of resources for further student reading. Students always can get background from these resources and from my lecture notes. The sequence of presentation meets their needs. This flexibility is not easily implemented with a text, where students inherently believe in the prescriptions presented in sequential chapters.

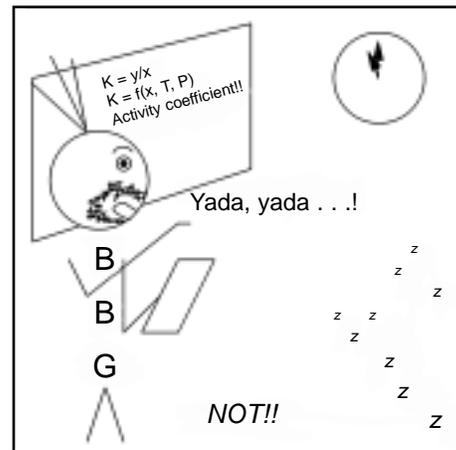
Students' learning to practice, not my personal teaching style, is the focus. After all, learning as evidenced by students meeting well-defined, appropriate objectives is the measure of teaching success. Teaching is not merely classroom performance so often measured by teaching evaluations. Teaching is:

- Identifying realistic course objectives based on knowledge of student background and professional practice requirements;
- Presenting material recognizing students' diverse, preferred learning styles;
- Using effective communication skills to address students' questions and answers; and,
- Developing effective evaluation measures to determine whether objectives are being met.

Defining course objectives for design and safety requires an understanding of all that students have been exposed to in earlier courses and what is required to practice in this very diverse field. The number of possible objectives stretches far beyond what can be placed in these courses. Perspective of professional practice is the necessary foundation to build an effective, yet limited, objective set. I feel that for me to be an effective teacher, I must be an effective engineer, continually practicing my profes-

sion in the actual setting into which students will enter upon graduation. This, of course, does not fit within the ever-narrowing confines of university professorial performance criteria. Stepping outside the university's confining logic box is necessary for me to be an effective instructor.

The students arriving in my senior-level courses are mature, dedicated, motivated, intelligent, and distracted. They are willing to work and change, particularly when they understand, if not accept, the approach. But they are students with many competing pressures and many foci in their lives



more important to them than chemical engineering, in general, and my classes, specifically. The days of engineering students studying an average of 60 hours a week are long since past. Yet the complexity of the milieu into which they will embark is far greater. This complexity implies a greater commitment on students' part. Yet, national studies show engineering students now spend about 29 hours a week studying, a substantially less commitment. Therefore, there is a premium required for teaching effectiveness. Effectiveness in objectives, scope, communication, and evaluation is critical. I must present the material recognizing their talents and their diversions.

Engineers' preferred learning styles tend to be sensory (hands-on), visual (figures, not words), inductive (specific to general), active (talk), and sequential (step one first, two second . . .). A lecture format with textbook does not optimally address these styles. They could not progress as far as their talents and dedication would allow them if I merely used that format. Further, there is a large percentage of the engineering student population which exhibits degrees of other styles (intuitive, auditory, deductive, reflective, and global). It is interesting to note that research results indicate that professors tend to teach to address their preferred learning styles. Analysis of undergraduate students indicates their preferred styles are substantially different than professors'.

Miscommunication and teaching ineffectiveness is probable, unless the professor changes his or her presentation style to match preferred learning styles of students. A single presentation style, within a semester or class period, would not optimally match the students' preferences. Learning would be less effective than it could be. Therefore I develop, test, and use a diverse mix of example, discussion, brainstorming, lecture, video, and demonstration to present the material at hand.

I encourage diverse opinions and require professional defense thereof. There are no limits to discussion or wrong theses presented. All participants must be free to pursue learning in their preferred methods, test their ideas, and re-evaluate as necessary.

While this might appear to lead to chaos to those who teach in a more structured environment and style, a subtle hand on the presentation usually results in meeting the goals for that period with students arriving seemingly on their own. When lectures are required, they are laced with personal experience (successes and failures), humor, examples, and identifiable goals and summaries to keep students' attention. Without diversions from a monotonous delivery, students generally tune away from material after 10 minutes, retaining little.

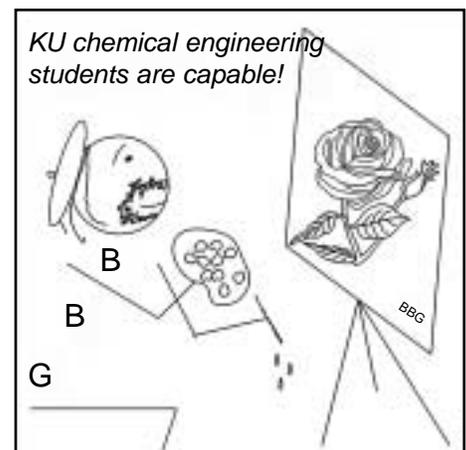
My standards are strict. The responsibilities that graduating chemical engineers must accept are immense. My evaluation must reflect a student's preparedness to accept them. Therefore, any evaluation of students must measure whether they meet the course objectives. Proper evaluation tools must be designed, recognizing diverse skills students must have. Yet they must be workable within the narrow confines of university course structure. All my evaluation questions are drawn from my personal practice tailored to senior-level skills. My goal is to have all succeed; after all, I am on their side. But, evaluation must properly reflect their achievement. Therefore, there are no easy A's, no set percentages. Evaluation is strict on a fixed scale. My goal is to have all earn A's, but I must accept when none do. In any case, I must always evaluate whether I have altered the standards, distorting the distribution.

To require students to think differently than they have in the past, to modify if not abandon methodologies that have been successful for them, requires that they are on my side and recognize I am on theirs. Therefore, I have my Rules of Approach that I strive to live up to. They are these:

- Memorize and use student names – They are people who deserve respect.
- Be prepared – They deserve their money's worth.
- Seek input, criticism, and suggestions from them – They help improve the course.
- Tell them everything & why – No secrets, no magic.
- Care for the material – This is not a job; rather, it is a passion.
- Show enthusiasm for them and for the material – Nothing is more important.
- Be fair and consistent – They deserve equal, credible treatment.
- Provide prompt feedback – Teaching via student work analysis is effective.
- Remember what it was like to be a student – Maybe we don't want to.
- Be empathetic, caring, and flexible – There are more important things than my class in their lives.
- Convey (and feel) that nothing is more important than they are.

I have no greater responsibility than to walk with my students from student to professional. The greatest impact I can have as a professor at the University of Kansas is to have students graduate and hold paramount public safety – practicing elegantly, efficiently, economically, safely. That's why I teach.

How I teach is constantly evolving to maximize my effectiveness, contributing to their training with the little time I have with them.



Colin S. "Chip" Howat is the John E. & Winifred E. Sharp Professor in the department of chemical engineering. He directs the Kurata Thermodynamics Laboratory, as well. He has taught at KU for 16 years.

Maturing as a Teacher

Anita L. Wingate

This opportunity to reflect on what I believe about teaching (and, inextricably linked, what I believe about learning) started earlier this year when a faculty peer invited me to share, over lunch, what created effective learning in my classroom. Writing on that same subject seems more daunting somehow, but it has been a valuable experience for me. Not wanting to seem like an old sage (particularly not wanting to emphasize the "old"), I hesitated to scrutinize my teaching career too carefully; acknowledging which teaching tools have been particularly effective requires that I also disclose which teaching tools I have found wanting. My reflections from the classroom will necessarily describe both the successes and failures.

When I began my teaching career, had someone asked what my teaching philosophy was (I can assure you that no one did ask), my answer would have involved some aspect of survival (mine, not students'). In the intervening years, I have come to realize that I can articulate a teaching philosophy, developed from my own years of experience and that of others who have written about education and learning. My philosophy is that the educator must create a learning environment that stimulates students to become life-long learners who can apply knowledge and skills in the dimensions of life that are important to them and in ways that benefit the society in which they find themselves. The educator doesn't create this learning environment unilaterally, but in partnership with the students he or she serves. The excellent educator recognizes what the balance of responsibility is between teacher and student in this partnership and remains accountable for his own significant role in creating the learning environment. In my maturation as a teacher, I have come to understand that the student, not the teacher, is the central focus of the learning experience. The teacher is just one of many instruments the student can use to dissect from the evolving world of information those pieces that that student will need to thrive.

Teaching in an applied science, nursing, creates many opportunities to stimulate students to synthesize from a wide range of basic sciences and humanities.

However, early in my teaching career, I assumed the heavy burden of somehow transferring great hoards of essential information to the minds of those unfortunate students compelled to take notes at break-neck speed as I rapidly shared as many facts as possible in the time period allotted. To my dismay, I soon discovered that each year at the students' senior celebration event, a few faculty members are selected for good-natured ribbing. The first year I attended this event, one student, with a particularly glib tongue, mimicked my rapid-fire delivery style to the huge amusement of everyone but me! For me, this verbal parody resulted in one of those "Aha!" moments that, in addition to embarrassing me, refocused my attention on an essential element of teaching, which is to facilitate students' learning, not just to offer them bounteous amounts of information. While the research had not yet been done that demonstrated that information density of a lecture reduces retention of basic information, I began to understand that students could be expected to learn more than I would actually be able to tell them in class. Looking back, I can be grateful that student evaluations were done less formally then, as my ego might not have survived the onslaught. However, it was from those early students' feedback that I surmised what wasn't working and adjusted my teaching style to something that was more likely to actually facilitate learning. Student feedback continues to be very important to me and is selectively utilized in planning each subsequent course offering.

The transition in my own career from an emphasis on teaching to a focus on learning was so gradual that I cannot say when it happened, but I know it was essential. Like most teachers who began to teach immediately after completing their own graduate education, I felt compelled in those early years to demonstrate how very much I had learned. Some years ago, the following two comments were among others (not all positive) written by students on my end-of-semester course evaluation: "Is one of the most knowledgeable instructors I've seen," and "Was very receptive to understanding the amount of learning we had to do and tried to help us out. Thanks."

At the time, I'm quite sure I valued the former more than the latter. Then at some stage, I realized that the highest compliment among students' evaluation comments is not their appreciation of what I know, but their appreciation of how I have helped them acquire the skills to learn. With the confidence that comes with years of teaching, I have learned that simplifying and organizing material, sharing memory tricks that clarify content, and starting where the students are is far more helpful than using those complicated words that might impress them with my own knowledge of the state of the science. And, of course, with maturity comes the realization that as knowledge grows exponentially, my own knowledge base is not as impressive as I might once have thought! Even more humbling is the realization that my own knowledge base can never be really adequate. But, like the students, the educator must expect to be a life-long learner and can model this for students by acknowledging when she doesn't have a ready, simple answer and demonstrating how she problem-solves getting the information and applying it.

After a number of years of teaching anatomy/physiology and then pathophysiology to large classes, I have learned some principles that are likely to promote success in the classroom. Engaging the student is essential and, fortunately, there are an almost unlimited means of doing this. Communication that is direct, open, and friendly has been very effective for me and starts on the first day of class, with the establishment of communication that is clearly a two-way conversation. Respect for the students is paramount, and that includes some tolerance for their idiosyncrasies. I have decided not to interpret the occasional student's habitual lateness to class as a personal insult, but to consider that behavior as an unfortunate habit which might change when the student realizes that something interesting and worthwhile is happening in the classroom.

As I matured in my teaching, I learned that I could give students some simple choices about how class was conducted, as one means of showing my respect for them. For example, I let them decide as a group about how the time allotted for breaks will be distributed over the two-hour class period. Another important choice involves testing; I have found that, after I select the units of content which I believe are obligatory for the final exam, giving the class a choice about which of several optional units might be covered on the final also gives them a sense of having some control over their destiny. I follow each exam

with an immediate post-test review, which allows students the opportunity to ask questions about items they missed so that real understanding can occur while the material is fresh in their mind. In response to faculty who worry that such a session gives students a license to argue about item responses, I would say that our encouragement of critical thinking requires us to engage in such discussions with students to help them learn to discern the nuances between the best answer and the wrong answers. Respect for the student is also demonstrated in such simple ways as managing class time efficiently, starting and completing class on time, and leaving room for summation and questions near the end of the period. Early in my career, I taught as though each student's life revolved around my courses; after all, my life did! The recognition that students have lives outside our classrooms is an important insight.

As teachers, we are reminded to break up our lectures into interesting mini-lectures to keep the learner engaged, interspersing lecture with other activities to keep the learner actively involved. This is an ongoing challenge, but even in a class of 120 students, posing a thought-provoking question can involve each student, as I first "poll" the class about their answers and then ask for a few volunteers to give their rationale for their choice. Recently, during a lecture on special senses that was getting tedious even to me, I stopped to ask which of the special senses each of the students would be most willing to give up. Then I narrowed the question to their preference for blindness or deafness, given a choice, trying to help them appreciate the loss felt by an individual with pathology in these systems. Another question which never fails to stimulate analytic discussion is "Which is the most important system in the body?" As students select their answers (neurological, cardiovascular, respiratory, and sometimes reproductive!) and present their rationale, they understand (sometimes for the first time) the obvious interdependence of body systems and the implications when there is pathology in any given system. Most importantly, such class discussions ensure that students are thinking again instead of just passively listening.

My maturation as a teacher has taught me that teaching is not instruction so much as it is facilitation of student learning, and students learn best when they believe the content has importance for them. For a nurse with doctoral preparation in a basic science, teaching pathophysiology to nursing students is a true privilege, as those students understand that

this content will be important to their understanding of the client's health problems. Their interest is often already established when they come to the classroom, and my task is to turn their interest into true understanding of the content. From my own experience and from observing other faculty, I have learned that success in the classroom is largely dependent on the teacher's excitement about what he is teaching and on the confidence the teacher brings to that teaching. If the teacher has the confidence that comes from being prepared for the course and for each classroom experience, she can relax and enjoy the interaction with students.

Meanwhile, my maturation as a teacher continues, with ongoing analysis of what works effectively in the classroom, which now includes the virtual classroom with its new set of challenges. In 1990, Ernest Boyer's *Scholarship Reconsidered* invited us to use reflection about our teaching in a scholarly way, triggering renewed debate about the value which should be given to teaching. My conception as a teacher began in the many classrooms in which I was a student, observing and experiencing a variety of helpful and not-so-helpful teaching strategies. My infancy as a teacher was that period of my professional life during which I believed I was the key player in the teacher/learner dyad. My maturity as a teacher (with a great deal left to be learned, I'm sure) is the recognition that the student and his or her learning is the focus of the experience, leaving me the freedom and the responsibility to create a learning experience that is enjoyable, sustained, and substantial. My death as a teacher (I'm not thrilled about carrying the analogy this far!) would come if I lost sight of that goal of creating a learning environment that stimulates students to become life-long learners. Fortunately, each new class allows a reincarnation of the precious opportunity to stimulate a passion for learning.

Anita L. Wingate is an associate professor of nursing at the University of Kansas Medical Center. Currently, she teaches pathophysiology courses for undergraduate students. She has taught at KU for 25 years.