Reflections from the Classroom

2015–16

Volume 18

Overview

As CTE prepares to celebrate our 20th year, we are taking this opportunity to highlight the careers of some exceptional KU faculty members. We have asked them to describe a turning point in their development as teachers—a watershed moment, or series of moments, that led them to approach their teaching differently. For some of them, the turning point was prompted by interactions with other exceptional teachers: Dorice Elliott recalls an insight she had at a teaching workshop, Tony Rosenthal found inspiration in teaching memoirs, Joey Sprague and Sandi Zimdars-Swartz point to illuminating conversations with colleagues, and Bob Goldstein recollects some powerful learning moments with one of his own teachers when he was a first-year college student. For others, like Robert Rowland and Carl Luchies, the critical juncture began with their students—the realization that they were not understanding or engaging with the material at the level they had hoped for. And Debra Hedden, Dan Spencer, and Bozenna Pasik-Duncan each brought questions or approaches from their own scholarly disciplines into their teaching.

   The insights and practices shared in the reflections from these exceptional teachers reveal several common threads and useful lessons for the rest of us. First, they underscore that teaching is a bidirectional activity between the teacher and the learner(s). Instead of simply focusing on what their students can learn from them, these faculty members also attend to what they can learn from their students. They listen to their students and gather information about their understanding, so they notice when an approach they have used is no longer working and can identify areas where their students are struggling or missing essential skills. The first essay by Dorice Elliot states it nicely: *"…this is not about your performance as a teacher, but about what the students are learning."* Second, all of these teachers experiment with their teaching, and they are not afraid to stretch themselves in the classroom to try new things. Some of their experimentation has been prompted by efforts to improve student learning or engagement, but in other cases it is motivated by new knowledge about practices that facilitate student learning and the realization that their students could do even better. This leads to the final theme, that of continuous improvement in teaching and learning. The authors of these essays did not experience their pivotal moment, adopt a new approach, and call it good. Rather, their reflections illustrate careful attention to what students are learning or not learning, and continuous efforts to improve upon that. Indeed, for many faculty members, a pivotal moment is the realization that this is what teaching and learning is all about: looking for new ways to understand more deeply our teaching and our students' learning in an ever-changing environment.

Andrea Follmer Greenhoot
CTE Director & Gautt Teaching Scholar

It's the Students, Stupid!

Dorice Williams Elliott
English

What I learned was simple enough: When you enter a classroom to teach, remember that this is not about your performance as a teacher, but about what students are learning.

Some years ago, I attended a teaching workshop that profoundly changed the way I've taught classes ever since. What I learned that day was simple enough: When you enter a classroom to teach, remember that this is not about your performance as a teacher, but about what students are learning. Most teachers probably pick this up intuitively, and certainly in today's academic climate, we are continually reminded that student learning is the goal; but at the same time we are continually evaluated for our proficiency as teachers, so it's sometimes easy to find our focus confused. Despite the simplicity of this message, it has a number of implications that extend beyond the classroom, especially now in the age of online, hybrid, and other new ways of engaging with students.

The first thing that changed in my teaching after that workshop, though, occurred in the classroom. I began to really look at my students instead of focusing on my notes or what I was going to say next. I began listening carefully to their comments and questions, trying to understand what it was they were trying to express, even if they were not very articulate. This led to my responding to them in a deeper way, asking them if what I heard was what they meant or asking what led them to that opinion or question. I tried to avoid just saying "good" or "interesting," or simply nodding, and instead seriously engage with what they said. As the discussion moved along, I would refer back to what Jane or John said earlier, calling them by name so that they knew I had not only heard but listened to what they said.

Sometimes this focus on what students said led the class in a different direction than I planned, but this taught me to become more flexible as a teacher, which led to my being able to walk around and become part of the class, even if it was a large one. And that way I could watch students' faces to see if they were engaged, confused, bored, or struggling to articulate something they wanted to say. It also enabled me to make eye contact with students—my goal is to do this at least once with every student every class period (unless the class is very large). I've sometimes been surprised to have a student who never said a word aloud in my class sign up for two or three subsequent classes with me. I think this is because they knew I cared about them, even if they were shy or quiet.

Another result of focusing on students shows itself in the way I grade their papers and assignments. Even for class exercises or quizzes, I try to find some way to personalize my response—even if it's only a check-mark, which I explain to them means they have made a good point. On major papers and exams, I use a rubric for grading, but I also try to assess where their individual strengths and weaknesses lie, addressing them by name and urging them to come meet with me individually to discuss how they can improve—even the students who have done well, who so often have an "A" slapped on their papers with few comments that address what they can still improve.

I'm not a flashy teacher. I can manage a simple PowerPoint occasionally and I can do a few things on Blackboard. I do try to vary the activities in a class period; once, when I was teaching younger students, I learned that a student's attention span is roughly equal to the years of their age (though I think this begins to go the other direction after middle age!), so I try to schedule three different kinds of learning activities in a 75-minute class period. I use small group discussions and projects, in-class writing, debates, student presentations, diagrams on the whiteboard, even modified board games occasionally—but I sincerely believe that the key to any success I have had as a teacher is simply my focus on the students, as learners and as people.

Engage the Brain!

Bob Goldstein
CLAS/Geology

The "muddle method" helps students learn that it takes time, basic skills, and hard work to come up with a solution, and it establishes a pattern of behavior that benefits students long after they have graduated.

Are you one of those people who feels most energized when your brain is working hard on a difficult problem? I am—and I think I learned this when I was a freshman. My professor for Introduction to Historical Geology, a geologist with a scraggly red beard and somewhat awkward personality, walked into our second day of class and did not go up to the chalkboard for his lecture. Instead, he stood in the doorway and said, "Let's go!" We proceeded to follow him out the back door of the science building of Juniata College. I recall vividly that he walked very fast, taking long strides. We had a hard time keeping up as he led us several hundred meters up a hill and onto a narrow trail behind campus.

Eventually, we reached a dead end where we stood on the precipice of The Cliffs, a deep gorge, with the Juniata River at its bottom. There, we had a close up view of the guts of the valley and ridge province of the Appalachian Mountains. As you can imagine, it was pretty, but my professor did not seem to care about that. He wanted to do something to me and my classmates—engage our brains—and what he did in the next minute left an indelible mark that would later impact how I

learn, how I teach, and what I promote as an associate dean. He pointed out the river far below. Then, he asked us to observe how the river's course headed straight into a mountainous ridge of rock. Rather than turning right or left, like any self-respecting river should do when it runs into a mountain in its path, the river and its valley could be seen to cut straight through the mountain, with a steep, gaping valley. The professor looked at us and asked, "How could this be?" There was no discussion and no answer. He just turned around and marched back down the hill to the science building, beckoning us to follow, happily humming as he went.

I will never forget this experience and what followed it, mostly because I could not figure out the answer to the problem he posed. Quite honestly, it really bugged me. I saw something that was as plain as the nose on my face, yet I could not understand how it came to be. I knew that there must be a reasonable explanation, and I just could not let go. I wrestled with it often over a period of weeks, yet still could not come up with the solution. As those weeks progressed, my scraggly bearded, humming professor taught us a few rules for geologic reasoning

that he said we would need. And he was right: Suddenly one day, the answer to that simple question dawned on me. The river had started at a higher elevation, originally flowed across a relatively flat landscape that was long ago at the elevation of the ridge tops, and that river later had cut straight down to etch out the landscape of those mountains and valleys. He never gave us the answer, but we got it, through engagement of our brains in solving the problem.

As I progressed with my education, I encountered this methodology (which my professor called the "muddle method") again and again. From small problems like the one I described, which seemed huge at the time, to a capstone experience, sort of a geologic boot camp, where student geologists were brought to the mountains of Montana, ushered out of the van that brought us, and were told, "OK, you are on your own. Map it, make observations, figure out the geologic history, and report it. You have two weeks."

Each one of these experiences was difficult, stressful, incredibly engaging, and memorable. They also built confidence and contributed greatly to my growth as a scientist. As a faculty member at the University of Kansas, I think about ways to "engage the brains" of my students in similar ways, by challenging them to make observations and solve problems. Even now, as an associate dean, I institute programs to promote engaged learning for our students in the College of Liberal Arts and Sciences. The students who are exposed to this approach certainly aren't bored, and they work very hard. The "muddle method" builds students' confidence so they know that they can solve any problem put before them. It helps them learn that it takes time, basic skills, and hard work to come up with a solution, and it establishes a pattern of behavior that benefits students long after they have graduated.

It is amazing what you can learn as a freshman. I learned that success in teaching and learning can be all about finding ways to propose problems to ponder—and that will engage the brain!

Flipping Dynamics

Carl W. Luchies
Mechanical Engineering

I asked my GTA, "What just happened?" The tables were turned, the classroom environment was exciting, and the students started hanging out after class.

Learning has been defined as the process of acquiring new and/or reinforcing existing knowledge. The student's success in learning, once thought to be primarily the responsibility of the student, is certainly affected by the support provided by the instructor. Both new and existing knowledge are the focus of ME320 Dynamics, a required course within the mechanical engineering curriculum. Dynamics builds on concepts covered in prerequisite physics, calculus, and statics courses.

My former traditional teaching pedagogy consisted of:
1. answering questions,
2. lecturing on new concepts, and
3. demonstrating the application of the new concepts by solving several example problems.

Given how interesting I found the material, I hoped students would also be excited and engaged. It became clear that I was losing the battle of limited attention spans. Unfortunately, my teaching pedagogy enabled passive learning, which was often distracted by the smart device held just out of sight.

Therefore, during the spring 2012 semester, I decided to experiment with one minor change in my approach to teaching Dynamics. Approximately 20 minutes before the end of each class,

when I would normally work the last example problem, I handed out the problem as an in-class collaborative quiz, to be turned in at the end of class to be graded. I used casual groups, which allowed students to work with whomever they chose. This was a watershed moment, a point in time that marked an important change. The classroom literally came alive. Instead of one person (i.e., myself) doing the teaching, numerous peer-to-peer teaching discussions took place across the classroom. Students were motivated to understand the new concepts, and they were engaged in applying those concepts to solve the quiz problem. The GTA and I roamed the classroom, listening to the discussions, answering questions, and addressing misconceptions. After the first collaborative quiz I asked my graduate teaching assistant, "What just happened?" The tables were turned, the classroom environment was exciting, and the students started hanging out after class. This experience provided motivation to spend time on more changes.

Each year the School of Engineering sponsors a teaching workshop at the beginning of the spring semester. The nicely timed 2013 workshop was titled,

"Implementing Hybrid Teaching Models: Methods and Resources." Drs. Robert Beichner (NC State), Susan Williams (KU CPE) and Dan Bernstein (KU CTE) presented talks that planted several seeds in my thought process about the relationship between teaching and learning. The rest, as they say, is history.

My teaching pedagogy has evolved tremendously since spring 2012. Today a typical ME320 class meeting consists of:
1. reading quiz (five minutes),
2. group development (five minutes),
3. lecture highlights (five minutes),
4. example problem (five minutes), and
5. group work (55 minutes).

I have used different kinds of groups (e.g., casual groups, collaborative groups, team-based learning groups). I recently started using CATME (CATME.org) to survey the students, form teams of five students, and complete peer evaluations. I have not "lectured" during class since I recorded my PowerPoint-based lectures using Camtasia and placed them on Blackboard. I use clickers for reading quizzes with the goal of holding my students accountable to attend class prepared. During group work, I use anonymous clicker polls to gather feedback regarding student progress and to provide feedback to students about their problem solutions. I use two-stage exams with the following goals: first stage (individual) to hold individuals accountable to be able to apply concepts to solve dynamics problems; second stage (group) to hold the individual accountable to be able to explain his/her solution and identify mistakes in the individual's or in a team member's solution. Scratch cards are used for the second stage to give each group the opportunity to discover the correct solution before leaving the exam. It's quite entertaining to watch groups celebrating their success. I use chapter learning objectives not only to prioritize the course concepts, but also to develop focused exams and to track learning outcomes. Assessing the impact that these methods have on learning is ongoing and challenging.

I've been fortunate to have access to active learning classrooms in the School of Engineering's new LEEP2 building. The active learning classroom design and technology enables the active learning pedagogy. These are amazing teaching spaces. I use both graduate teaching assistants and undergraduate teaching fellows to assist students during group work. I have also used valuable resources across campus such as the C21 faculty meetings, the Center for Teaching Excellence, and the Center for Online and Distance Learning. As might be expected, some of the active learning pedagogy used in Dynamics has migrated into my graduate-level engineering courses.

The process used to redesign my teaching pedagogy has been taken one step at a time. Some steps resulted in success, others ended in failure, but each step taken is part of my journey to improve my teaching methods with the goal of enabling my students to become effective learners. Have I arrived at the perfect balance in the relationship between teaching and learning? Certainly not. Will I continue to experiment with new ideas and methods to create the best learning environment for my students? Absolutely. My classroom has come alive, and active learning is here to stay!

Daring to Try Something New

Robert C. Rowland
Communication Studies

When I think about turning points in my nearly 30-year (gulp) teaching career at KU, I almost always mull on moments when something didn't go very well. I think of the moments when a lecture that previously had worked well suddenly fell flat or when discussion lagged on a topic that students normally find stimulating or when a graduate class was having trouble making the transition from critiquing research to producing potentially publishable research.

From these moments of failure, I've learned three lessons. The first is that teaching remains an art and that there is a certain randomness to what works in a given circumstance. Of course there are best practices or in my case strategies that I've found usually work for engaging students. But there is no guarantee that those strategies will work on any given day. On the other hand, I've also learned that having a repertoire of strategies and being willing to shift gears even in the middle of a class usually can produce good results. I've taught an introductory rhetoric course as a "flipped class" for a quarter century. As an aside, I didn't know it was a flipped class until Dan Bernstein explained the concept to me, one of the many useful lessons I learned from that master-teacher. I just knew that I thought college students ought to be able to read the book and apply the principles in discussion without my lecturing to them about it. That strategy usually works, but there are days when getting them to discuss even the most powerful works of rhetoric requires a dental degree because of the teeth pulling involved. When that happens, I've found that breaking my normal practice and simply lecturing to them about why the rhetoric is important and what it tells us often can get them involved. The lesson for me is to be willing to try multiple strategies until I find one that works.

The second lesson I've learned is to take steps to make sure that students have basic study and analysis skills. For example, I now sometimes collect the notes that students take in class as a low-stakes assignment to encourage them to take notes. I've found that I actually need to teach them how to take notes, and I use several strategies to do so. Our wired world provides fabulous resources for engaged students, but it also provides great distraction to that sense of engagement. The good news is that being stubborn in expecting them to do daily assignments can achieve wonders!

The third lesson I've learned is that my absolute favorite and best moments of graduate education occurred when I realized that I had been wildly wrong in defending some position. It is not that being wrong was such a great thing, but that the process of engaging with doctoral students made me realize my errors. Wow, that is always a great day. The students had helped me learn something new. My lesson is to not shy away from taking positions in graduate classes and glory in the moment when students demonstrate flaws in a position. Teaching always involves the risk of being wrong. Rather than fearing that moment, I think we should glory in it as a chance to learn with our students.

Anonymous Grading

Sandra L. Zimdars-Swartz
Humanities

Assessing student learning used to be my least favorite aspect of teaching. I enjoy the process of determining the best method for assessment (objective questions? short answers and essays? projects?), even constructing the assignment. But I dreaded sitting down to grade student exams and papers, knowing full well that for many students our mutual biases about each other were likely to clash over pieces of written work.

That began to change a decade or so ago when I began teaching Western Civilization in a large lecture/discussion format. I had the privilege of working with two stellar graduate teaching assistants: Crystal Johnson, who is now the division chair for social science and business, and faculty history instructor at Metropolitan Community College, Maple Woods (MO); and Howard Graham, who is now director for academic programs in the Office of First-Year Experience at KU. Both Crystal and Howard maintained that our assignments needed to be graded anonymously. As I recall, Crystal insisted that her stu-

dents needed to know that she was grading not them but their work, and that she had eliminated as much as possible gender and racial bias when she assessed their papers, exams, and projects. Howard agreed, and added that the outcomes sometimes surprised him—when author identity was eliminated, those he had thought were "A" students hadn't always produced "A" work!

Indeed, Howard had experienced what psychologists call the "halo" effect, a cognitive bias in which a positive impression of a person in one area of functioning influences one's perceptions of that person in other areas. A likeable student who is a regular participant in class discussions, for example, may be assumed to do well on exams and essays; the student who does well on the first section of an exam may be given the benefit of the doubt on subsequent sections. John C. Bean, in *Engaging Ideas* (2nd edition, p. 222-223), advocates anonymous grading and has several suggestions for eliminating the halo effect. He suggests that for in-class exams,

for example, students sign up for four-digit numbers that they then place on their exams; after the exams are graded the authors can be identified through the numbers and grades recorded. Rather than grading a multiple-section exam (e.g., short answer and essay) in its entirety for each student, he proposes grading all the answers for one section, then shuffling the exams, and grading the next section. If grades for each section are entered on a rubric rather than on the exam itself, scores on one section are less likely to influence scores on the other sections.

Crystal and Howard got me started on anonymous grading, and I have been forever grateful. Although not possible in every situation, I use it whenever I can, and Blackboard has made author anonymity much easier for papers turned in and graded online. And I have found that my post-grade discussions with students have been more enjoyable, focusing not on why I graded *them* the way I did but on how they can improve their *work* in the future.

What Teaching Children Taught Me about Teaching College Students

Debra Hedden
Music

> Regardless of age, I believe students learn from our modeling, an influence that is far more profound than their reading or completing assignments.

When I transitioned from 20 years of teaching elementary general music into a collegiate position in which I taught general methods to music education majors, I was curious what might be similar in terms of teaching. I was plucked out of public school and put into the collegiate setting without any preparation for that change, or so I thought. I arrived at the college level invigorated and excited . . . until the second week when I asked myself, "What makes me think I can teach college students when all I have ever done is teach children?"

What I discovered was that there were some things that differed between the ages, but that there were also elements that remained constant. That might seem like a strange comment to make, but there is merit in considering this. When I entered the collegiate classroom, it became obvious that teaching is teaching. One does not teach music, but rather teaches *people* about music. Thus, despite the age differences of elementary and college students, the basic approach to teaching and helping people learn music and music teaching was strikingly sim-

ilar. Music remains an inanimate entity— something written on the page—until people are involved. The fact that I was working with people, regardless of age, made the transition smoother than I had originally anticipated.

When working with children, I provided learning through a variety of activities both to maintain their focus and to reduce the possibility of discipline issues. The effectiveness of children's learning was solely dependent on my ability to plan and implement quality teaching and learning. I discovered their musical learning and behavior were a direct reflection of my teaching; if they were successful and behaved well, I had succeeded and if not, I had to reflect on my missteps and repair them.

The modeling I did served to create success or failure. All of this, too, is what I found was necessary at the collegiate level. To develop and maintain interest in learning how to teach, to learn methodology and pedagogy, and to learn classroom management, was accomplished through consistent modeling of overall pedagogy, pacing, lesson quality, and classroom management. Regardless of

age, I believe students learn from our modeling, an influence that is far more profound than their reading or completing assignments.

At both levels, it was imperative to be fair, to be consistent, and to clearly communicate expectations. Those expectations became a part of my syllabi, which students tell me are more extensive than others they have seen, but my reasoning for this is to avoid confusion and misinterpretation. I blame it on all those years in public school where clarity and frequency of expectations occurred with eight classes and a choir every day. An interesting twist I discovered was the manner in which expectations and directives were perceived. While the little ones interpreted all directives literally, the college students were far beyond that. I had to teach college students to think as children so they could anticipate their students' questions and explain clearly how they wanted young students to perform the tasks asked of them.

Additionally, a part of every methods class is focused on classroom management, both in terms of being proactive through quick pacing and interesting lessons, and being reactive by attending to discipline issues. The means for teaching classroom management I relied heavily on my experiences in public school, and I immediately began to "manufacture" discipline issues when our preservice students taught each other. The purpose was to make them aware of issues, to prevent and attend to issues, and to keep students engaged as positive learners. In preparing teachers for the classroom, those personal experiences were invaluable, some of which were successful, some were failures, and some were outrageously funny.

The startling revelation I made in teaching at the college level was that teaching children prepared me well for teaching college students. What became clear was that there were far more similarities than differences. And because of all the public school experience, the knowledge of how schools work, how children learn, how music programs develop, and what management of a music teaching position requires, I acquired the tool kit to prepare teachers for the rigors of the K-12 classroom.

Turning Point

Dan Spencer
Business

After exposure to and reflection on literature addressing knowledge, knowledge building, and learning processes, I realized that I was using dysfunctional teaching practices in my basic courses. In good conscience, I could no longer continue to engage in those practices.

The academic year 1989-90 was a key turning point in my development as a teacher. I was in Tokyo, Japan, as a Fulbright Research Scholar, conducting a management study at Nippon Telegraph and Telephone. I was engaging in a mixed-methods research project where I was using ethnographic methods for the first time in my career. My project was not going well. I was experiencing firsthand the tensions between the use of quantitative and qualitative methods. It submerged me into a deep reflection of the practices I was using. I found myself in the midst of a profound personal shift in my worldview—a shift toward an alternative knowledge-building paradigm rooted in a very different set of beliefs about reality and how we know about that reality.

This experience had such an impact on me that upon returning to Kansas I radically altered my organizational behavior seminar for doctoral students. The first five weeks of the semester became a general introduction to basic philosophical issues in the social sciences. These perspectives were then used in the remaining 10 weeks of the course to critique the field of organizational behavior. A very positive student response encouraged me to redesign the content of the research methods course I taught the following semester. Previously I had taught 100% traditional quantitative methods. I changed the course to 50% quantitative methods and 50% qualitative methods. This modified course, like my organizational behavior seminar, ended up being extremely successful. In fact, several Ph.D. students from that class went on to complete doctoral dissertations that had substantial qualitative components.

As all this was unfolding, I became aware that the business school at Penn State had implemented a philosophy of science course for its Ph.D. students. I polled KU students about their interest, and they were excited about the idea. To prepare for this new course, I audited a series of courses in the philosophy department. I ended up creating a course I titled "The Philosophy of the Behavioral and Organizational Sciences." Students were exposed to 20th-century movements in thought, and their responses to this course were fantastic. I have taught it every other year since 1993, with systematic content and pedagogical process updates along the way that have gradually allowed the course to become increasingly student-centered.

In the early- to mid-1990s, I also began to reorient the learning experiences I created for students in my undergraduate and master's-level courses. After exposure to and reflection on literature addressing knowledge, knowledge building, and learning processes in general, I realized that I was using dysfunctional teaching practices in my basic courses. In good conscience, I could no longer continue to engage in those practices. I shifted from being teacher-centered to being learner- and problem-centered. I increasingly emphasized student engagement in the classroom, to enhance higher-order learning that took students beyond lower levels of Bloom's taxonomy (rote learning, such as remembering, understanding, or explaining) to the higher levels of application, analysis, synthesis, and evaluation which promote creative and critical thinking.

I began experimenting with team-based learning to pursue this goal. By the mid-90s I devoted 100% of in-class time to problem-based learning by student teams that remained together throughout the semester. Over time I discovered that team-based learning requires systematic consideration of a variety of issues such as:

- Composition of members
- Creation of tasks that require reciprocal interdependence among members
- Establishment of team structure in the form of goals, rules, roles, and systematic continuous feedback mechanisms

- Team building to establish effective norms regarding performance processes, and
- Creation of a supportive course context, including appropriate reward systems, course structure, and physical environment.

I continue to experiment with all of these features. One example of this incremental experimentation is the evolution of a team review process. It started as a team process description, which involved having one team member describe what happened during the team session and what conclusions the teams arrived at. Over time I discovered that the most valuable part of the report was identifying team process losses. This learning tool was then renamed the team process critique, and its focus was changed to solely identifying process losses and gains, with an emphasis on losses. The tool evolved further when it was modified to include reflections on the individual role performances of team members. The process again changed when students not only reflected on their individual and collective performance but were expected to act on those reflections and establish improvement goals for each session. One further innovation of the process was to have all team members contribute to the critique generation process. This enhanced the thoroughness of the analysis and increased the amount of feedback, particularly for the role performances. This process has been an invaluable mechanism for pushing

teams through the learning cycle, guaranteeing that student teams more rapidly progress through their stages of team development.

Assessment of learning outcomes has also evolved over time. By the late 1990s I stopped all use of multiple choice and true/false quizzes to assess reading and preparation, and I began to rely on graded assignments that document and thus ensure advanced preparation for each class. Team-based learning simply will not work without all students being prepared to apply the conceptual material. Eventually all student assessments were in the form of essay exams, short papers, and longer project-based papers for both individuals and teams. In addition to strengthening students' writing skills, these kinds of assignments have also allowed for much more meaningful assessments of higher-order learning.

I have experimented with these and many other facets of pedagogical process over the years, and I continue to do so. I likely would be in a very different place today regarding my approach to teaching and learning without the crisis that I experienced conducting my research in Japan. It was the definitive turning point in my development as a teacher.

Thirty Years Later: Integrating Research and Teaching

Bozenna Pasik-Duncan
Mathematics

A classroom becomes a scientific laboratory.

Over my 30 years of teaching, I have come to realize that a classroom is much like a scientific laboratory. I would like to describe how I have implemented this approach in a particular course, Math 750: Stochastic Adaptive Control, which was developed for students from science, technology, engineering, and mathematics. The diversity of students enrolled differs from year to year; therefore, the way the course is taught, its content, and applications differ, too. Here are some major course concepts.

Classroom teaching as a stochastic adaptive control problem

In systems theory, we analyze every system carefully. We analyze the existence of a solution and computational aspects of it, simulate stochastic equations, collect information, compose results, etc. We do the same in our teaching. A classroom becomes a scientific laboratory. Students are unknown to the instructor at the beginning of a semester. They come from different departments with different academic backgrounds. The challenge for the instructor is to learn about students by collecting relevant information about them. Too many unknowns in the system make the system unknown, so identifying the system is a critical issue in the stochastic adaptive control and in teaching, as well.

Short bio as first assignment

One of the best practices for learning about students is to ask them to prepare a short bio with information that will help us as instructors find optimal adaptive strategies. The information could include student's family and academic background, math and science courses taken, motivation for taking this course, short- and long-term goals for studying, hobbies, plus career, research, and real-world problem interests. This information is important when we design projects for students.

There are many unknowns in this system, so we need to estimate (learn) them as in the theory. Then a controller/teacher adapts this new estimate throughout a semester. We collect information, analyze reports and data after every class, and try to do better each time. We can see teaching as a stochastic process that changes over time, a process with several

components such as vision, design, data collection, and data analysis. We integrate teaching and learning, thus approaching teaching as scholarship.

C5: collaboration, communication, connections, curiosity, and creativity

These five words drive the work we do in this course. During the semester Tyrone Duncan, my departmental colleague, and I participate in scientific discussions that take a place in the classroom. Students witness how we respond to their questions, and how we demonstrate that *collaboration* in research and in teaching are important and rewarding. *Communication* and writing skills are equally important. We use in-class discussions and out-of-class assignments to help students improve their communication and writing. Students read independently outside of class and submit written reports from their reading. Stochastic adaptive control taught in this approach makes it exciting for students to make *connections* among different areas of mathematics, since this course brings many areas together. *Curiosity* is the most important part of learning in this course. Students are aware of what they are doing, ask why things are the way they are, and try different ways to explain to each other what they observe. They are taught to consider how even the most abstract mathematics can be applied to real life problems. The cross-boundaries nature of stochastic adaptive control motivates them to be *creative* while searching for models in the real, complex world.

Guest speakers

Guest speakers energize students. Neurologists, mathematicians, and engineers from medical research centers show brain waves and explain how mathematics can detect or predict seizures. Musicians modify a piece of well-known music by adding a noise, duplicating frequency behavior in powerful ways. Here students discover connections between science and art. Bringing in research collaborators, especially those from other countries, changes students' perspectives. They see how math and adaptive control can be found everywhere.

Peer tutoring

Peer tutoring plays a crucial role in my course by building a community of learners, since students become teachers for their peers. This aligns with the goals of promoting engagement, communication, and an exchange of ideas. Mathematics is often a quiet pursuit, but in this class students talk with one another, building not only a community of learners but also lifetime friendships.

Conclusion

Integrating research, learning, and teaching using the stochastic adaptive control approach has proven to be most effective and enjoyable. It continues to be my true passion and love in research and teaching.

Metaphor Reconsidered

Joey Sprague

Sociology

I realized that the essence of scholarly activity is not the substance of the work but rather how we go about doing it.

"Think about your teaching the way you think about your other scholarship."

I can still hear Dan Bernstein, former director of the Center for Teaching Excellence, say these words and remember wondering what he could possibly mean. As an "elite" graduate student at an "elite" institution, my funding had always come from fellowships or research assistantships. I had never been trained how to teach, much less given any concrete experience. The idea of teaching as a form of scholarly activity was news to me.

Dan's advice felt like a puzzle. On the one hand, I wondered how I could I apply the principles of the scholarly activity in which I had been trained, sociology, to teaching. On the other hand, wasn't I already being scholarly by providing a good coverage of the relevant research literature? A way out of the puzzle came when I realized that the essence of scholarly activity is not the substance of the work but rather how we go about doing it, the process of inquiry. That is, what makes something scholarly is methodology.

Applying social science research methodology made me realize that I needed to reconsider the metaphor I had been using for teaching—a review of the literature. I needed to put that literature review into the context of a broader process akin to posing a research question, collecting data, analyzing it, interpreting the findings, and submitting them to peer review. The steps in that process that have been the most challenging have been the practices analogous to posing a research question and to conceptualizing and operationalizing key concepts.

Posing the question: Up until this point I had been thinking of organizing a presentation of the literature in terms of important debates and key findings. But in research, literature reviews are organized in relationship to a specific question. What part of the literature should I cover and why? That is, I had to think about goals for student learning that led me very quickly to an orientation toward my students: Where were they coming from? What kind of background did they have? What were the next logical steps for them?

Conceptualization and operationalization: I routinely emphasize to my students that research questions have to be specific enough to give empirical direction as to the kind of evidence required to address them. Yet as a teacher I

had been operating under the most abstract of goals, saying I wanted students to become "familiar with the literature," and "develop critical thinking" and "a sociological imagination." I would never let my students be that vague with their research questions! What did I actually mean by critical thinking, for example? How would I recognize it in students? Could I think of it concretely enough to be able to observe variation and, especially, stages in its development?

I don't claim to be close to having this knocked. Every class—sometimes every day—is an opportunity to discover that my assumptions need questioning or that my tactics are not effective. However, applying this methodological model directs me toward tools I know how to use. These tools give me some direction on how to discover where to tinker or even what to throw out entirely. On those occasions when I do make a clear linkage among specific goals, a nuanced sense of what those mean, and clearly defined indicators, I get the kind of empirical confirmation that gives a real sense of accomplishment. In other words, thinking about teaching the way I think about my other forms of scholarship has made teaching more engaging.

So thanks, Dan.

From Baggage to Collage:
A Surrealist Orientation

Anton Rosenthal
History

*I learned two things:
1. the classroom is an
ongoing experimental site
that demands constant
innovation and risk-taking
strategies, and
2. you teach how you are
in the world.*

Early in my academic career, shy and anxious about speaking in front of groups, I invited myself into many of my colleagues' classes, here and elsewhere, to watch them teach and try to glean how they made magic happen. It had been a couple of decades since I was an undergraduate, and I thought that by observing experienced professors I could somehow find my own voice and get a better sense of how I might relate to contemporary students. I was completely unsuccessful in this endeavor. It turned out that my colleagues knew their material really well, were engaging storytellers, had excellent timing, could tell a good joke or could draw on their family experiences and years of fieldwork in very effective ways, or were genuinely warm, nurturing human beings whose qualities infused their classrooms. Sadly, I had none of these gifts and little in the way of expertise. What to do?

I abandoned the idea of emulating any one of their styles of classroom presentation or even creating some unwieldy hybrid of their best elements (for fear of creating a Frankenstein's professor),

and I began to read teaching memoirs, a genre I'd never thought about before. From Jane Tompkins (*A Life in School*) and Jay Parini (*The Art of Teaching*) I learned two things: 1. the classroom is an ongoing experimental site that demands constant innovation and risk-taking strategies, some of which will fail; and 2. you teach how you are in the world. I found these ideas to be very liberating. Instead of trying to emulate someone else or discover some golden key to teaching well, I decided to assess what things I'd acquired on my own crooked journey from sociology major to offset printing pressman, darkroom technician, bookstore manager, newspaper typographer, film school dropout, and postcard collector. My evolution as a university teacher came about slowly and through the realization that instead of trying to impress my students through powerful or spectacular presentations I might fulfill a less flashy but essential role as a subversive guide.

I drew on my background in three significant ways. First, from my sojourn in graduate film studies I had acquired enough knowl-

edge about film history and how cinema worked as a medium that I found that I could effectively weave short clips from documentaries and feature films into my presentations of 20th-century history that would provoke discussion by forcing students into the less comfortable position of having to constantly triangulate differing but equally authoritative views about historical events and processes. This strategy also had the wonderful side benefit of upsetting the nap cycles of the least engaged while improving the overall retention of material.

Second, from my work on the collectively managed community newspaper, I had learned to value collaboration, which led me naturally into team teaching, especially of the interdisciplinary type. I've found this to be the most rewarding form of teaching as it similarly forces students into constant analysis of material and ideas coming from multiple voices, and by its very structure it promotes spontaneity and experimentation. From Mary Klayder in English, whom I've collaborated with on both an honors course on travel and a workshop for undergraduates on gaining non-academic life experiences, I learned to occasionally just go with a few ideas and see where the session might take us.

Finally, I realized that I could come at the teaching of history from a surrealist perspective, one that used a knack I seem to have for making connections among disparate things, either on the fly or after surrounding myself with things for a time and waiting to see what emerges. I have found joyous visual analogs for this process in the painter René Magritte's surrealist landscapes, Joseph Cornell's wildly inventive shadow boxes, and John Heartfield's satiric photo montages of the 1930s. Such an orientation values collage, juxtaposition, and the obliteration of boundaries as methods of inquiry, while privileging the serendipitous qualities of found objects, like postcards. As Magritte said in 1938, "Surrealism claims for our waking life a freedom similar to that which we have in our dreams."

Thinking along these lines has given me the confidence to teach some history courses chronologically backward, starting with the present and then peeling away layers of the past; develop a course in another discipline (urban sociology) that then led me back to an innovation in my own field; offer eight-week half-credit courses on specialized topics that do not warrant a full semester; create visually grounded courses that purposely refuse to employ PowerPoint so that I am not trapped by a linear narrative; and teach topics that I have no training in, just an interest to learn alongside my students (global history, history and ethics, anarchism, sin cities). I come to these classes less with an agenda of comprehensive coverage than with the attitude of an agent provocateur eager to teach against student expectations and to occasionally foster creative disorder in the moment from which some new self-awareness might emerge.

I'm the first to admit that I'm not among the best teachers in my department, and that there are certainly risks in operating outside of norms, but I am very much myself in the classroom. Who else could I be?