

2

Teaching as a Problem in Applied Psychology

Stephen L. Chew
Samford University

I am currently professor and chair of psychology at Samford University in Birmingham, Alabama, a position I have held since 1993. I earned my undergraduate degree in psychology from the University of Texas (UT) and my PhD in experimental psychology from the University of Minnesota. I spent nine years teaching at Gustavus Adolphus College in St. Peter, Minnesota before moving to Samford. In 1998, I was selected to be a Carnegie Scholar by the Carnegie Foundation for the Advancement of Teaching. I was awarded the James Buchannan Award for Excellence in Classroom Teaching by Samford in 1998. In 1999, I was named “Professor of the Year” for Alabama by the Carnegie Foundation. In 2005, I received the Robert S. Daniels Award for Excellence in Teaching by the Society for the Teaching of Psychology.

My Early Development as a Teacher

I am the first to admit that my academic career has been shaped more by fortuitous circumstance than any grand plan or ambition. I entered UT as an engineering major. I had always liked science, but engineering was awfully dry stuff. My father suggested I try psychology. I took general psychology in a class of 500+ students with a professor named John Belknap. I was entranced by his ability to engage and influence so many students. I decided that I wanted to be a college professor. I wasn't completely sold on psychology at that point, but I found it interesting enough to switch my major and give it a try.

I grew to love psychology because it blended science and the human element, and I had wonderful mentors in Bob Young and Janet Spence. I had the great good fortune to be accepted at Minnesota for graduate school as a student of Jim Jenkins and as a member of the multi-disciplinary Center for Research in Human Learning (CRHL). There could not have been a more stimulating, supportive place to train. Jim was my advisor until he decided to seek warmer weather at the University of South Florida. I finished my degree under Herb Pick. In both Jim and Herb I had tremendous mentors and role models about what a psychologist, and specifically, a teacher of psychology, should be.

My first teaching experience was in graduate school. Few graduate programs in those days offered any instruction in how to teach. The CRHL offered periodic training meetings on professional topics such as teaching. I had sat through about three meetings

on teaching given by fellow graduate students. I figured that made me pretty well prepared to teach. The first course I ever taught was, as is usually the case, introductory psychology. It was an evening, continuing education course that met once a week for almost 3 hours. I was the second youngest person in the room, and I spent the entire time lecturing. I enjoyed teaching and my evaluations were (surprisingly, in retrospect) positive. My teaching career had begun. My first full-time job was as a sabbatical replacement at Gustavus, which eventually turned into a permanent job.

Working at Defining Myself as a Teacher

I went through a course of development that I believe is typical for most teachers. My two main goals in my first year of teaching were to avoid looking like an idiot in front of my students and to make sure my fly was zipped. During my second year, I tried to decipher the hastily scribbled notes I had written out the previous year. In my third year, however, I began reflecting on my courses and thinking about how they might be improved. I began attending teaching conferences in search of tips. I discovered the American Psychological Association's (APA) *Activities Handbooks for the Teaching of Psychology* and the journal *Teaching of Psychology*. I incorporated many activities into my teaching, but was disappointed to find that many of them really didn't fit the way I teach. They were too cumbersome to carry out, too time consuming for the amount of information learned, or too complex for students to grasp. After attending teaching conferences for a few years, I realized that many of the activities get recycled from year to year, like recipes for potato salad in church cookbooks, and I found less and less of value in attending them. Although I enjoyed teaching greatly, I knew that I was still not the kind of teacher I wanted to be. I began to ask questions that went beyond teaching practice. What are my students learning in my classes? Will they remember and use the information after the class is over? I think every teacher confronts these tough questions at some point. Mediocre teachers turn away from them, and content themselves with defining teaching as merely presenting information. The best teachers, however, accept the challenge of trying to understand what students have learned and search for ways to deepen and shape that learning.

Early in my career, I had teaching experiences that taught me important lessons about how students learn. These were teachable moments for me as a teacher, and I reflect on them often. Here are some key ones and what I learned from them.

Teaching Moment 1

In general psychology, I used to offer review sessions for which I prepared practice exams. The idea was to provide formative assessment for students to identify their areas of weak understanding. The sessions were always lively and well attended. I

created the practice exams from old exams, and there would be questions on topics not covered in the current class. Usually I cut these questions out, but one year several questions ended up on the practice exam by accident. When I realized it, I figured I would just explain the oversight when the students noticed that the questions didn't belong. To my surprise and chagrin, only a few students (all of them top students) noticed these questions. The rest of the students simply guessed at the answers in blissful ignorance that they had never been taught the material. I realized that most students were treating the practice exam as a guessing game, not a diagnostic tool. Often they read the question and then looked up the answer without really trying to solve it. Through confirmation bias they would decide that they could have answered the question correctly. Even when students took the practice exam seriously, they might do miserably on it but still be shocked when they did miserably on the real exam. I learned several lessons from this episode. First, I discovered the importance of metacognition for successful learning (e. g., Hacker, Dunlosky & C. Graesser, 1998). The best students had a good understanding of what they did and did not know. Hence they knew when they encountered questions over topics they had not studied. Not so for weaker students. Second, students often engage in pseudo-study in place of actual study. Students believed that by treating the practice exam as a guessing game, they were actually studying for the exam. There are many examples of pseudo-study, such as studying what you know rather than tackling what you don't know, or skimming eight chapters in one night. Third, it showed me the tenacious denial some students show to feedback that is contrary to their beliefs or self-image (Chew, 2005). I stopped giving review sessions. Even though they were popular, they were having no effect, or even a negative effect, on most students' learning. Now I use formative assessments that force students to confront whether they understand a concept (Chew, 2005).

Teaching Moment 2

In my cognitive psychology class, I use a demonstration for tip-of-the-tongue phenomenon where I ask students trivia questions. If any student gets tip-of-the-tongue, they raise their hand and report what they can about the answer. The demonstration is always fun. One year, I saw a student several days after the demonstration. She told me how much she had enjoyed it. In talking with her, though, I realized that she remembered the demonstration in detail, but had no recollection of the concept being demonstrated. I realized that students may remember a fun and striking demonstration without remembering the point of the demonstration. I have also come to realize that demonstrations and activities can easily become too complex to be effective. Students concentrate so much on doing the activity that they have no cognitive resources left

available to reflect on and learn the lesson of the activity. Students can successfully complete an activity and learn nothing from it. I've learned the importance of both carefully monitoring the cognitive load imposed by an activity and requiring students to reflect on the activity in a way that promotes schema development (Chew, in press).

Teaching Moment 3

When I first started teaching, I strived to come up with clear, precise definitions of concepts. Often though, I would have several ways of defining a concept that I liked. So, in class, I gave all the definitions, explaining a concept in several different ways. One year I got a comment on my evaluations that read "Dr. Chew has trouble explaining concepts the first time, but he gets it right at about the third try." This comment showed me the importance of explaining concepts in multiple, diverse ways and building some redundancy into presentations, because students learn and understand in different ways and at different rates.

Teaching Moment 4

In my cognitive psychology class, I test using essay questions that I select from a pool of about 10 questions that I give to students to prepare in advance. One year I asked students to use the cognitive principles they had learned to design how a class ought to be taught and assessed. I expected essays applying attention, levels of processing, and transfer appropriate processing to the classroom. Instead, I got stock beliefs such as, essay questions test understanding while multiple-choice questions test memorization and repetition is the key to learning. Despite all they had learned in the class, students had failed to apply the knowledge and reverted back to the preconceptions they had when they first started the course. This episode demonstrated the power of misconceptions that students bring to the classroom and their resistance to correction. I now use formative assessments to anticipate and correct common misconceptions (Chew, 2005). I also write conditions and constraints into my assignments to try to prevent simplistic answers and induce the students to think more critically about issues.

The Examined Life of a Teacher

As my career developed, I applied what I know about cognitive psychology to my teaching. I developed methods of having students process information at deep levels and develop schemas rather than memorizing facts. My training in cognitive psychology gave me an advantage in teaching over non-psychology faculty. When I give teaching workshops, I usually introduce basic concepts of cognitive psychology to the participants. But I also became increasingly aware that most teaching is not based on sound psychological theory or a body of empirical research about how people learn. Most teachers base their pedagogy on intuitive, untested assumptions and beliefs, or by

uncritically modeling other teachers. Teachers usually can't offer any direct evidence of student learning. Evidence comes primarily from grades or anecdotes (Chew, 2006).

Teaching is strongly fad driven, and most fads are presented as improvements in teaching without any sound rationale or convincing evidence. My university received a grant to implement problem-based learning (PBL). Leading practitioners of PBL instructed us in its components. I kept asking for a theoretical rationale for why PBL is supposed to lead to better learning, but no one could provide a meaningful answer. We were instructed in a process, and the assumption seemed to be that if we followed the process, students would automatically learn more. Psychologists know more about learning, attention, and motivation than any other field and we know that none of these issues are simple. Our teaching, more than anyone else's, should be based on sound empirical principles. Our training should make us critical and skeptical of educational fads.

After teaching for about 10 years, I had implicitly grasped the notions that the goal of teaching is helping students to develop enduring understanding, that activities differ in their ability to promote understanding, and that understanding is multifaceted. These ideas, along with my concerns about the current state of teaching crystallized into a deeper understanding of the teaching process when I became involved with the Carnegie Foundation through the Carnegie Academy for the Scholarship of Teaching and Learning (CASTL) program. Lee Shulman and others at Carnegie introduced me to the Scholarship of Teaching and Learning (SoTL) framework that elevates innovative acts of teaching to a form of scholarship (Shulman, 2004). In effect, SoTL conceives of teaching scholarship as acts of creativity, insight, discovery, and integration that are documented, critically assessed, and shared. Teaching becomes a research field. Intuition and trial-and-error are replaced by systematic studies of teaching effectiveness guided by principles of how people learn. For psychologists, this idea means that teaching becomes a subject of applied psychology like human factors or clinical therapy.

This view resolves much of the paradoxical thinking psychologists have held about the relationship between the teaching of psychology and research in psychology (Chew, 2006). Somehow, when we do research in learning, we view it as a complex behavior influenced by many factors, but when we teach, we tend to think of learning as a simple matter of presenting information that the students will absorb. As researchers and clinicians, we know that people possess prejudices and misconceptions that are highly resistant to change. We also know there are many ways to influence peoples' thinking and behavior. We often treat students as empty vessels who will passively take in whatever information we give them. We feel there is nothing we can do to influence

student motivation or learning. Our sole responsibility as teachers is to present the information clearly and accurately. Helping students develop an enduring understanding is not our responsibility or even within our power. This simplistic view of teaching allows us to believe that teaching is easy; anyone can be a good teacher as long as he or she can present accurate information. Once we view teaching as an applied problem in influencing understanding, all these simplistic misconceptions no longer hold. Teaching becomes as complex a field as any other in psychology. We move beyond teaching tips to theories and research that guide best practices in teaching.

When we view teaching as an applied research problem and the classroom as a natural laboratory, we appreciate the complex interaction of factors that teachers must monitor, manage, and manipulate for successful student learning. Teaching is a dynamic interaction among students' preconceptions and learning strategies, the nature and format of the material to be learned, the strengths and pedagogical practices of the teacher and the learning goals. In the classroom, I have conducted research in designing and implementing examples that lead to deep learning, the tenacity of student misconceptions and how to address them, and the importance of cognitive load in designing effective instruction. Without the SoTL framework, I probably would not have considered any of these issues relevant to teaching or worthy of investigation.

Advice for New Teachers

New teachers are mostly concerned with teaching technique, and rightly so. Creating new courses is a daunting task. Assuming the role of teacher is a huge responsibility. There are plenty of excellent resources on technique for the beginning teacher. I concentrate here on advice that teachers might use throughout their careers.

Effective student learning is the sole measure of good teaching. Teaching is not about presentation, it is about learning. It is not about impressing students with one's brilliance, preparation, or use of technology; it is about developing student understanding. As a corollary, good teachers always use assessment to make learning visible. Teachers should always ask themselves, "What evidence do I have that my students are learning?"

Always meet the students where they are. What are their goals and expectations for taking the class? What knowledge and preconceptions do they bring to the class? Good teachers have a grasp of these issues and tailor pedagogy to take students from where they are to a deeper understanding of the subject matter. I am not advocating lowering one's standards, but rather helping the class reach those standards by understanding the students. Do some students not try to learn? Yes, but I am arguing that before we conclude that students are not trying to learn, we need to make a comprehensive effort to enable them to learn.

One's development as a teacher is never finished. Like research, it is a lifetime process. We never feel that any issue is completely understood in research nor do we feel we ever know all the research tools that we need. The same is true for teaching.

Think of teaching as "disciplined improvisation" (Sawyer, 2003). Teaching is in many ways performance, but it is a performance tailored to an audience to get them from one level of understanding to another. The methods and content change depending on the audience. Good teachers constantly monitor the class's level of understanding and adjust their teaching accordingly.

Don't be afraid of fruitful failure. Sometimes we try promising innovations and they do not work out, leading to negative teaching experiences. We tend to see negative teaching experiences as a personal failure on our part. In traditional research, a researcher can pursue a reasonable hypothesis; and even if the hypothesis is not supported, the work is seen as useful and beneficial. We need to adopt the same attitude in teaching.

Final Thoughts

Too many teachers think the key to good teaching is getting good students, because good students get good grades and appreciate our efforts. It is much easier to complain that the admissions office does not recruit students who match our teaching styles than to modify our teaching to serve the students we have. For me, good learning experiences make good students. It is up to us to provide those experiences for our students.

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