Imagine 90 veterinary virology students singing “It’s Beginning to Look a Lot Like Rabies.” In our large science classes (more than 50 students) each three- to four-member student group is assigned a virus family to research and then teach to the rest of the class. Frequently they use well-known songs and other devices. Can students deeply learn complex content this way? Based on our experience, we say, “You betcha!”

We contend that actively engaging students in the learning process is not only essential, it’s the key to deep and meaningful learning. Increasingly research supports this contention. However, teaching large classes, particularly in the sciences— introductory biology, physics, immunology, and professional curricula such as veterinary medicine, for example—offers many instructional challenges. Rather than responding to these challenges, most math and science faculty opt for the teacher-centered lecture format. One survey suggests that 89 percent of math and science college teachers continue to use lectures, even though research indicates that when students are engaged, more and better learning results. We think the difficulties of involving students in large classes can be overcome. We’d like to use the rest of this article to share just a few of the interactive strategies we’ve used in our large science classes.

Interactive Lecture—Our interactive lectures begin with an attention-getting introduction—maybe music, a cartoon, or even a provocative question—followed by 10- to 12-minute lectures. Then, in groups of two or three, students actively process content by talking about it, writing about it, and working on a sample test item or even a short problem-based situation. Even though these interactions are brief, they help students grasp, apply, and analyze the content rather than just memorize it. These short, interactive “think tanks” also reset students’ attention span for the next 10- to 12-minute content chunk. We end our interactive lectures with an assessment measure, like a one-minute paper or the muddiest point.

Cooperative Learning Groups—We believe that teaching in large science classes should not be restricted to lecture only. Group activities can be used to enhance learning. We assign students to three- to five-member groups. These groups meet throughout the course to work on problems and case studies. In immunology (a class with 100-plus undergraduate and graduate students) we set up these groups during the first week of class. The problems and research projects the groups are assigned are sometimes presented orally, other times in writing. We keep the groups on task by assigning roles like recorder, checker (checks group member consensus and understanding), gatekeeper (ensures that all members participate), and divergent thinker (responsible for presenting the group with new ideas). Groups are accountable for how well they work together as well as for producing completed assignments.

Jigsaws—In these cooperative learning groups, students read and share research articles or other reading assignments. Each student is responsible for teaching essential content to other group members, with understanding and mastery checked by the instructor.

Games—Competitive games enthusiastically engage students in large science classes. Within a “Jeopardy!”-like format, student groups can be randomly selected. They pick a category and answer each item with a question. Our teaching assistants ration Monopoly-like money to group winners, with the top-producing group earning points applicable to the final grade. A host of popular game templates can be found online at www1.umn.edu/ohr/teachlearn/tutorials/powerpoint/games.html.

Constructive Controversies—The large class can be divided into small groups and given polarized topics to debate, with one group for and another against. They prepare their defenses and then two randomly selected groups debate the issue during the class period. The remaining students contribute by asking questions.

Group Tests—In immunology class, students take exams two ways: individually and as a group. Students first take the exam by themselves. After submitting
Large Courses and Student Expectations

Have you tried implementing some active learning strategies in a large course only to find students resisting those efforts? You put students in groups and give them some challenging discussion questions, only to see most of them sitting silently while a few make feeble comments to which no one in the group responds. Faculty authors of the study referenced below had students in their large classes tell them that discussion was a waste of time. “I’m not going to be tested on what other people in class think!” (p. 125) This kind of resistance can quickly dampen faculty commitments to active learning strategies. These faculty honestly reported that they wondered if it might just be easier to return to straight lectures.

However, before making that retreat, they decided to try to understand why students were responding so negatively. They designed a 136-item survey that inquired about all kinds of attitudes and experiences in large classes. By the way, the survey is included in the article—it might be very instructive for individual faculty to use in their classes. They administered the survey to students in 14 sections of courses offered by five departments: music, history, math, psychology, and sociology. The survey asked about large courses generally rather than about the courses in which it was administered.

A number of interesting results emerged from the data. For example, the researchers compared the answers given by students in their first semester of college with those of students who had already taken large courses at that institution. They found that those students who had already experienced large courses “were more likely to prefer and expect passive-learning approaches in large courses “were more likely to prefer and expect passive-learning approaches in large courses” (p. 130)

132) Inexperienced versus experienced students’ expectations as a result of previous experiences in large classes can be changed. They decided that change happens one classroom at a time. If students start experiencing active learning activities in large courses, they will at some point come to expect them. In addition to a number of other helpful strategies the researchers are now using successfully in their large classes, they conclude with an important reminder: “Not all students are prepared for active learning experiences. . . . Therefore, we are very open at the beginning and throughout the semester in discussing our expectations for the course, the teaching, learning, and assessment methods planned for the course, and how to be successful in the course.” (p. 132)

More troubling, those experienced students were less committed to their large courses. Researchers support this conclusion by pointing to data indicating that these students more strongly preferred lectures, were more likely to skip large classes, wanted to be told what to do in large classes, didn’t want to work in groups, were less willing to do ungraded work, and had less interest in large classes that offered a mix of classroom activities.

Both new and experienced students expected that lower skill levels would be important to success in large courses. For example, more than 90 percent in both groups expected that they would be given multiple choice exams in large courses. Very few expected that they would have to write essay exams.

If large classes challenge students less and if students resist being involved in them, then the authors worry about those beginning students who take mostly large courses. Given all the research that establishes a connection between involvement and retention, they question the viability of making all introductory courses large courses, wondering if class size might not contribute to students’ decisions to drop out.

Their findings helped to explain the student responses they were seeing in large courses. The findings also rejuvenated their commitment to use strategies that involved students in these courses. However, the findings raise the question of how students’ expectations as a result of previous experiences in large classes can be changed. They decided that change happens one classroom at a time. If students start experiencing active learning activities in large courses, they will at some point come to expect them. In addition to a number of other helpful strategies the researchers are now using successfully in their large classes, they conclude with an important reminder: “Not all students are prepared for active learning experiences. . . . Therefore, we are very open at the beginning and throughout the semester in discussing our expectations for the course, the teaching, learning, and assessment methods planned for the course, and how to be successful in the course.” (p. 132)

As I grow into a new career as a college teacher, I am learning some really important lessons from my dog, Liza. A rescue dog, we picked her up at a kennel in one of Philadelphia’s poorest neighborhoods on a dreary day in January.

Like many of my students at La Salle University, Liza had a rough beginning. When we brought her home, she spent days cowering in her crate. When I let her out, she followed me around the house, never more than a few inches from my side. At the slightest noise—the doorbell, a lawn mower, a shout—she shook like a frightened child.

But love changed Liza. The trembling stopped. She came out of her crate to play with her toys. Her short walks turned into long runs in a nearby dog park. Fear is a terrible thing, and I wanted to make sure that Liza would never be fearful again. So when she jumped and squealed with excitement, begging to be picked up whenever I arrived home at night, I happily obliged. When thunder struck during a walk at the dog park, I held her in my arms and carried her back to the car to help calm her nerves. In the face of possible danger, I wanted her to know I was there to make it better—to rescue her.

Nine months and an Animal Planet lesson later, I now recognize that I did all the wrong things. Far from soothing Liza’s anxiety, my attention actually increased it. By showering her with affection when I arrived home, I reinforced her anxiety about being alone. By picking her up at the sound of thunder, I lent credence to her fear of the sound in the first place. A hard lesson, but one that has helped me understand what I’ve been doing wrong as a first-year university professor as well.

I was attracted to La Salle in part because of its legacy as a place where the sons and daughters of the working class became the first in their families to go to college. Although that profile is now changing, many students still arrive on campus with a certain blue-collar mentality about their intellectual ability. Even those with great potential sometimes give up before they’ve even tried.

Case in point: Last semester I had an extremely bright young woman in my magazine-writing class. In class discussions of even the most abstruse writing, she made insightful comments that opened the way to broader issues. She aced pop quizzes. But when it came to writing a full-length magazine piece, she proclaimed that she was simply not up to the task and would have to take a C or worse for the course.

How did I respond? With the same “I can fix it” mentality that I had used with Liza.

At first, I took the approach of cheerleader. “Of course you can do it! You are smart and talented!” When that didn’t work, I used another tried-and-true teaching technique: Find something the student is passionate about and let the student go with it. I suggested a story related to nutrition, something I knew she cared about. That idea was dead in the water a few seconds after I suggested it.

Finally, the student picked her own topic, one that struck me as completely idiotic: She would write a profile of a man who had won a major regional eating contest and who was destined to go on to be the world champion of what’s called “professional eating.” Maybe she was going to get a C in the course after all.

Several weeks later the student’s story hit my desk, and it was wonderful. By simply describing the eating contest and the winner, the story showed the absurdity—even obscenity—of such events at a time when millions of children around the world are dying of malnutrition. But the story needed major reorganization to realize its publishable potential and it was the end of the semester. Instead of taking two hours to sit down with the student and carefully talk her through the needed organizational changes, I simply made the changes myself, in cut-and-paste fashion, and then presented them to her as a finished product. She was flabbergasted at how good her piece was—and I gave her an A for the course!

What I have come to realize is that I have been trying to rescue my students and fix their issues the same way I tried to help Liza. Which brings me back to that show on Animal Planet. Instead of rushing to hug Liza when she yelps and jumps up to greet me at the door, I now practice turning my back and letting her calm down before I approach her. When she gets spooked by thunder or something else at the park, I continue to walk her on her leash rather than pick her up and carry her to the car.

In the coming academic year, I want to take the same approach with my students. Instead of solving their problems for them, I want to support them as they solve their own problems. I can provide tools and teach them how to use the tools. I can offer encouragement, but I shouldn’t be doing the work. It is work they must do for themselves.

Lessons for a New Teacher Learned from a Rescue Dog

By Hunty Collins, La Salle University, PA

collinsb@lasalle.edu

LARGE CLASSES
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their individual tests, they meet in small groups to take the same test as a group. An average of the individual and group scores represents each student’s score for that test. Students report enhanced satisfaction with the test process, and they tell us they learn more. We have not established that empirically.

Active engagement in the learning process helps prepare students to function proactively and effectively in our global community and to address a host of challenges facing us in today’s world. Our advice? Start small; maybe try a think-pair-share strategy. But do start working to engage and involve students in large science courses.
Content Knowledge: A Barrier to Teacher Development

Now, there's a story headline you might read in the educational equivalent of the National Enquirer. Aware that your material prevents instructional growth? How can that be?

A love of the material and a willingness to convey that to students only enhances learning. The problem is when the content becomes the be-all and end-all of the teaching process, when the content matters more than anything else. When content is that important, faculty are prevented from using methods that enhance how much students learn. In this case the content orientation of faculty hurts students, but the argument here is that it also hurts teachers.

When teachers think the only, the best, the most important way to improve their teaching is by developing their content knowledge, they end up with sophisticated levels of knowledge, but they have only simplistic instructional methods to convey that material. To imagine that content matters more than process is to imagine that the car is more important than the road. Both are essential. What we teach and how we teach it are inextricably linked and very much dependent on one another.

Even though both are tightly linked, they are still separate. Development of one doesn't automatically improve how the other functions. So you can work to grow content knowledge, but if the methods used to convey that knowledge are not sophisticated and up to the task, teaching may still be quite ineffective. It may not inspire and motivate students. It may not result in more and better student learning. Because teachers so love the content, they almost never blame it. No, it's the students' fault. They aren't bright enough. They don't study enough. They don't deserve to be professionals in this field.

But teachers who teach courses in which large numbers of students struggle and routinely fail are not generally positive about teaching. They are more often cynical, rigid, and defensive. The truth about how much isn't being learned in these courses is hard to ignore, no matter how routinely students are blamed.

The typical college teacher has spent years in courses developing the knowledge skill set and virtually no time on the teaching set. This way of preparing professors assumes that the content is much more complex than the process, when in fact both are equally formidable. Marrying the content and the process requires an intimate and sophisticated knowledge of both. Some kinds of content are best taught by example, some by experience. Other kinds are best understood when discussed and worked on collaboratively. Other kinds need individual reflection and analysis. Besides these inherent demands of the content itself, there are the learning needs of individual students, which vary across many dimensions.

The best teachers are not always, not even usually, those teachers with the most sophisticated content knowledge. The best teachers do know their material, but they also know a lot about the process. They have at their disposal a repertoire of instructional methods, strategies, and approaches—a repertoire that continually grows, just as their content knowledge develops. They never underestimate the power of the process to determine the outcome. With this understanding, content is not a barrier to teacher development.

Those Students Who Participate Too Much

What would we do without those few students who are always ready to speak—who make a stab at an answer when no one else will, who ask for clarification when they are confused, who even respond to things other students say in class? Most of those students we would like to clone. But then there are those who communicate to excess. They would answer every question if we let them. They would happily dominate every classroom discussion if allowed. We call these students the over-participants; in the research literature they are known as compulsive communicators, and researchers estimate that a bit more then 5 percent of students fall into this category.

The rest of the class loves and hates these classmates. They are loved because they take the pressure off everyone else. They are hated because they speak so much. Their endless contributions soon bore others. And they are hated because they make those who struggle to contribute feel woefully incompetent.

Their behavior also presents all sorts of problems for the teacher, who would love to call on somebody else, but often that familiar hand is the only one in the air. Generally over-participants are bright students. They care about the content and have the level of motivation a teacher would like to see in all students. But their determination to keep themselves always at the center of discussion tests in most of us the patience and commitment to participate.

Generally teachers do not rebuke the over-participant in public. Researchers in the study mentioned below asked students what they expected teachers to do about fellow classmates who over-participated. They found that students expect teachers to manage compulsive communicators through management strategies that are not rude or demeaning. Students “do not want to witness a fellow student subjected to negative sanctions when it comes to this particular transgression.” (p. 28)

When teachers do not address the problem, according to this research, students rate them lower on measures of credibility and affect or liking. In fact, doing nothing about compulsive communicators results in even more negative student perceptions.
Making a Syllabus More Than a Contract

By Roxanne Cullen, Ferris State University, MI - cullerr@ferris.edu

For years I’ve introduced my course syllabus by saying, “This is your contract for the course.” And all too often the document read more like a contract than a true representation of my conceptualization of the course. So I revised my introductory composition course syllabus in an attempt to create a more learner-centered academic experience. Although these elements have been at the core of my teaching, my syllabus did not necessarily make them explicit or clearly articulate their function to the students. Based on advice I found in several resources regarding the syllabus, I came to see that a teacher needs to consider the ways a syllabus can be useful to students. My goal was to make my syllabus more than the standard contract between my students and me. I wanted it to become a tool for learning.

I began by analyzing my syllabus using a rubric that I developed with a colleague based upon principles of learner-centered pedagogy. The original design of the rubric was as a tool for administrators to determine the degree of learner-centeredness in a department or unit based upon a review of course syllabi. The rubric has three main categories, each with several subcategories. The main category, Community, includes subcategories that relate to the accessibility of the teacher, the presence of learning rationale, and evidence of collaboration. In the category Power and Control, the subcategories focus on teacher and student roles; use of outside resources, and the general focus of the syllabus: Does it focus on policies and procedures or is it weighted toward student learning outcomes? Is there opportunity for negotiation of policies, procedures, assignment choice, etc.? In the category Evaluation and Assessment, the subcategories examine the use of grades, the feedback mechanisms employed, types of evaluation, learning outcomes, and opportunities for revising or redoing assignments.

A review of my syllabus inspired me to revise. I made several changes to emphasize the concept of community. Although I have always provided rationales for assignments when I talked about them in class, I added a rationale statement for assignments in the syllabus. I also provided rationales for all policies and procedures so that they would look less like arbitrary laws set down by the teacher and more as though they served enhanced learning. I also incorporated more teamwork and collaborative projects, again with a rationale tied to learning outcomes. Finally, I made an effort throughout to disclose information about myself, mostly in regard to my experience as a composition teacher and a writer.

The most significant change I made was in the area of power and control. Instead of establishing an attendance policy, class participation rules, or penalties for late work, I indicated that all of these would be negotiated by the class. Because the course is populated by first-semester students, I was reluctant to share much more power than that.

My former one-page syllabus was now 10 pages and included a short philosophical statement on learning to write along with writing- and learning-related justifications for every policy and procedure. In an effort to make the syllabus a working part of the course in which students discovered for themselves what they needed to know about the course, I had them write their first essay on the syllabus. I asked them to consider things like their expectations of the class, what they thought my expectations were, what they thought they knew about me, and what their roles and responsibilities included.

I was actually eager to read the essays. In some respects, I felt that my work was being evaluated by them, which provided an interesting twist on power and control. Their essays became another feedback mechanism for me. Equally if not more interesting was the conversation among the students as they prepared to write. I use WebCT, so I suggested to students that

**Students Who Participate**

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than does addressing the problem puni-

What’s the best advice, based on this research? Address the problem using positive and constructive communication strategies. It helps to have a discussion early in the course about the characteristics of effective discussion and teacher-student exchanges. If students are asked to describe those conversations that hold their attention and help them learn, they are usually quick to name the over-participation prob-

lem and state preferences for dialogue in which many people participate. Teachers should design participation activities that require the contributions of many: small groups presenting brief reports, sharing examples, or offering summaries.

It may be useful to talk privately with the student who is participating too much. It may help to make clear how and why too much communication from one student inhibits the learning of others. Perhaps the student could be encouraged to move his or her participation to the next level by not just answering questions, but asking them; by not just making comments, but specifi-

ally responding to things other students say in class.

Participation norms are established early in the course. If a teacher holds fast to hearing from lots of students right from the start, that norm will be established and can be maintained throughout the course.

Insight into the Teaching Self

The two nurse educators who authored the article referenced below begin with a quote from the first page of Stephen Brookfield’s book Becoming a Critical Reflective Teacher. “One of the hardest things teachers have to learn is that the sincerity of their intentions does not guarantee the purity of their practice.”

The example they connect to the quote is teacher authority. “Professional authority is derived from greater knowledge of a particular field. It is harbored in the hierarchical relationship of expert to teacher to students and is further enforced institutionally through the intrinsic power and obligation to assign grades.” (p. 299) Their point is that nursing as a field has experienced a movement toward more student-centered pedagogies. The authors endorse these approaches, seeing them as mechanisms that develop students’ critical thinking abilities, ultimately making them better caregivers. But traditional approaches to teaching make the kind of sharp distinctions between teachers and students that prevent developing the kind of relationships that promote student autonomy.

Their point is that teachers can endorse these more democratic approaches to education and still teach in ways that reinforce traditional hierarchical models. Unfortunately, many teachers are not particularly reflective about their practice. They do not take time to consider the implications of instructional actions—to "view authority from the students’ perspective and suspend our own judgment to come to a clearer understanding of the teaching process as experienced through the eyes of the students." (p. 302)

Through the process of reflection, "teachers are compelled to confront answers that may reveal we are other than the venerable teachers we perceive ourselves to be. . . . We may discover that we are unwitting accomplices in maintaining, rather than challenging and changing, the status quo.” (p. 302)

Teacher authority is not repudiated in these emancipatory models. But it is understood in more sophisticated ways. The goal is not to empower students in ways that ignore their mistakes or deny their ultimate accountability. “Teaching that is authentic . . . involves a genuine fostering of student autonomy as opposed to codependence, a teacher-student relationship that is collegial as opposed to friendly, communication that is candid yet caring, and the expectation for personal and professional accountability.” (p. 301)

Even though this article deals with curricular reforms in nursing education, the same kind of changes are taking place in many other fields, and their points about teachers’ lack of insights into what they do, why, and how it impacts learners are relevant to faculty in every field.