Things have changed. Vet school is no longer the same ol’ same ol’. Teaching styles and techniques have changed. Students have changed.

“The traditional paradigm of the instructor being the sole source of information and pouring that information into a single vessel, the student, is antiquated,” says Tom Molitor, professor and chair, Veterinary Population Medicine Department. For example, today’s students are accustomed to finding whatever information they seek almost instantaneously with a sweep of their finger across their iPhone touchpad or by hitting a key on their Blackberry.

Changes are also afoot at the Veterinary Medicine (CVM).

“There is a movement in teaching to get students more actively involved in the learning process,” says Molitor. “Studies have shown that students learn and retain information better if they are engaged in an active manner.”

In 2006, Molitor and others at the College set out to develop, evaluate, and implement unique teaching techniques in the classroom. Over the past four years, this core group of faculty has been meeting with other CVM faculty each Friday at noon for either a formal presentation or an informal conversation on innovative teaching methods. Their efforts have paid off.

Besides Molitor, this core group of faculty includes Deb Wingert, director of educational development; Laura Molgaard, associate dean of Academic Affairs; Robert Washabau, professor and chair of the Veterinary Clinical Sciences Department; and Al Beitz, professor and interim chair of the Veterinary and Biomedical Sciences Department.

**Grassroots movement**

A prime example of this core group’s work and the brainchild of Beitz involves the use of i>clickers in the classroom. This commercially available wireless product consists of a plug-in computer device and an i>clicker for each student. The gadgets function just the way the audience clickers do on the popular “Who Wants to be a Millionaire” television program. But instead of a contestant using the “ask the audience” lifeline to solicit a consensus answer, the instructor presents a question with multiple choice answers, then asks the students which one they think is correct.

After attending a national neuroscience meeting in November 2008 where i>clickers were discussed, Beitz returned to the College and presented the idea to the innovative teaching group in an informal conversation. By that winter, when the New Year’s issue of the journal *Science* ran an article on i>clickers, Beitz was using them in his classroom, followed shortly by David R. Brown, professor of pharmacology, then Molitor.

Student Kara Carmody responds to questions via i>clicker.
The use of clickers engages students immediately in a course. When using the devices, Brown allows his students about 30 seconds to select the correct answer to a multiple-choice question. Once the computer calculates the percentage of each answer received, it generates an answer profile in graph form that can be projected on a large screen.

“If a lot of students select an incorrect answer, I will let them stop and talk to each other to discuss the results and permit them to try again,” says Brown. After the students have had a chance to discuss the question and re-vote, most often they vote for the right answer. “They’ve learned the value of collaborative discussions and that a 30- to 60-second discussion is enough time for them to come up with the right answer as a class,” Brown notes.

In January 2009, clickers were used in a few select courses at the College. Today, they are available across the entire veterinary curriculum.

“It’s a perfect example of an innovative idea brought up by a single faculty member that is now being used across the College,” says Molitor. “First the idea was shared through the Friday conversation. It was then implemented and evaluated. And it is now well-established as an important teaching technique.”

Another member of the core group, Dr. Robert Washabau, brought an idea to the group as a conversation in teaching. Washabau’s idea was to hold journal article discussion groups with first-year veterinary students in which students would be given scholarly articles to read and report back to the group. The purpose of the exercise was to stimulate critical reading and scientific application to clinical problems. The journal club exercise was so successful that multiple instructors in the first-year curriculum implemented an integrated journal club reading.

**Tapping creativity**

While Molitor still uses the traditional lecture as a mainstay of teaching, he no longer lectures for 50 minutes straight. Using active learning techniques, Molitor breaks up a lecture to help keep students involved and engaged.

For instance, in his Veterinary Virology course for first-year veterinary students, Molitor divides his class into “expert groups” for one learning activity. The students in each group are tasked with becoming proficient at a group of viruses over time. For example, they need to be able to answer whether their particular viruses can survive within the environment and the best way to eliminate them. At one point during the course, Molitor tells each group that Jimmy Jam has arrived on campus and he’s putting together a series of virus songs and looking to the College for help. Each group then generates a song about a particular virus or family of viruses and is given the opportunity to perform their virus song in class. One videotaped performance even ended up on YouTube.

Last fall, Rob Porter, pathologist in the Veterinary Diagnostic Laboratory and clinical professor in the Veterinary Population Medicine Department, wanted to do something different in his second-year lung pathology lab, but he wasn’t sure what.

“You want the lab to highlight the information you present in lecture,” Porter says. “I wondered if I should let the students look at gross lung sections, but I wasn’t sure we had enough preserved specimens, and preserved specimens look different than acute lesions. So I asked myself: What is it that I really want them to take away from the lab?”

Throughout veterinary school, students must assimilate large amounts of information that they need to be able to recall years later, but sometimes that recall fails them. Porter decided to focus on pattern recognition in diseased lungs because he thought recall would be higher. He eliminated the option of projecting slides of diseased lung tissues because students spend countless hours in class looking at slides.

“I thought we needed to get them actively involved,” he says. “At first, I was going to have them draw the lesions.”

But then the idea hit him. He decided to have his students decorate cookies. That’s
Ricardo Chebel, assistant professor in the Veterinary Population Medicine Department, works with students studying large animal medicine.

right, decorate cookies. He broke his lab of 90 students into groups of three or four and assigned each group a respiratory disease. The next day, he gave each group four regularly shaped sugar cookies and one seven-by-five-inch pink cookie from a local bakery shaped to resemble a healthy lung. Each group also had access to a variety of edible decorating supplies, such as icing, drops, food coloring, and sprinkles.

Their assignment was to decorate the lung cookie to resemble a diseased lung based on the disease assigned to their group; decorate two of the sugar cookies to reflect the causes of the disease; and decorate the other two to represent a defense mechanism of the body that might help ward off the disease.

“Our imaginations went wild,” Porter recalls. “I told them, ‘I’m expecting factual information, but you are the artist.’” The comments Porter heard while the students were busy at work ranged from scientific discussions about what pattern their diseased lung should take to almost childlike squeals of delight at being able to call on their inner creativity. “It was really rewarding for me to hear such an extreme range of opinions being expressed,” Porter says.

The creations were varied. A group of students working on bronchopneumonia colored the cranial-vertical portion of their lung cookie bright red, while decorating two of their cookies with sprinkles representing bacteria and the other cookies to resemble neutrophils or macrophages.

“They were big into creating inflammatory cells to represent defense mechanisms of the body,” Porter notes.

Carrie Rodman, class of 2012 and student council vice president, enjoyed Porter’s lab. Her group, which was assigned pulmonary thromboembolism, decorated its cookie to look like a large dark blood clot.

“It was fantastic, a nice change of pace,” Rodman says. “It was nice to see an instructor put in extra effort and not just make us go through the daily grind.”

At the end of the lab, each group presented their creations explaining why their cookies looked the way they did. “We left knowing our specifics and many of the other groups’ specifics,” notes Rodman. Porter expects to repeat his cookie lab next fall.

Let the games begin

Veterinary students have been playing a form of veterinary medical “Jeopardy” in class and at home for two years now. Introduced by Wingert, the game is an updated version of flash cards modeled after the popular “Jeopardy” television show, played online using an elaborate PowerPoint program. Faculty members have made the game available mostly as a teaching tool, so students can become proficient at musculoskeletal and neuropathology terminology. The engaging game allows students to review these topics at home in a fun and challenging way. But others, like Molitor, have actually used it in the classroom.
Molitor’s version of Jeopardy involves putting a group of students in the hot seat, then projecting the Jeopardy play board on a large screen. If the group answers correctly, another group enters the hot seat. Meggan Bandrick, a D.V.M./Ph.D combined degree student, played Jeopardy as a student in class and is now a teaching assistant for Molitor.

“I really liked playing it. We used it as an end-of-semester review,” says Bandrick. “It’s a game. It’s fun and it’s different. You get to be active in class. You’re less of a passive participant.”

Students have also been playing a version of “Who Wants to be a Millionaire” in Molitor’s Introductory Immunology course. As expected, a group of students face off with Molitor, who acts as the game host, doling out the questions. The student group has the same lifelines as the television program: ask the audience, 50-50, and phone a friend—typically a teaching assistant.

“Everyone is really engaged,” says Bandrick. “They are paying attention and scrambling to find the answer.”

Real life, real problems

It’s never too early for a veterinary student to begin to think like a doctor.

That’s the philosophy of Kelly Hall, assistant clinical professor, Veterinary Clinical Sciences Department, who teaches one of five of the Professional Development Series courses called How to Think Like a Doctor, taken by students in the second year of veterinary school.

Even though second-year students have not yet learned all the cardiovascular or respiratory diseases, Hall says they still need to start the process of learning to think like a veterinarian.

“This course lays the groundwork for students to figure out what is wrong with a sick animal and how to prepare a treatment plan,” says Hall. Because there are multiple ways to approach a case, Hall discusses correct treatment options and the choices that could worsen the situation.

In the third-year toxicology course, students are divided into groups of three or four to work on real clinical cases seen at the Veterinary Medical Center. In one instance, students were to determine whether the amount of ibuprofen eaten by a dog was a toxic dose or if the animal’s acute kidney failure was brought on by another cause. They then write up treatment orders.

“We are getting them to commit to being a doctor by having them make decisions on how to diagnose and treat.”

- Kelly Hall

Turning it upside down

After listening to a guest speaker at one Friday innovative teaching seminar, Erin Malone, associate professor, Veterinary Population Medicine Department, decided it was time to turn her Urology Systems lectures upside down. At least it was time to test out a new exercise in team-based learning, a technique that evolved from business schools but which has quickly spread to the sciences.

Typically, Malone had been doing what the vast majority of teachers do. She first filled her students’ heads with information provided in lecture format, then sent them home with a few tough problems to work on, and finally tested them on their knowledge.

Team-based learning reverses the processes. To test the technique, Malone divided her students randomly into two groups: traditional learning and team-based. Malone sent the students in the team-based learning group home with her PointPoint lecture and other printed materials.

“I told them I wanted them to go through the printed materials first, then come in and take a quiz, first on their own and then in a group,” Malone notes. She then used what would have been her lecture time to go through the quiz verbally with her students and work through a few of the advanced problems.

“It basically flip-flops the class,” she says. “If they only have me for two hours, shouldn’t they be using me to go through the hard stuff?”

Perhaps one of the newest technologies to come along that could revolutionize teaching, according to Brown, is Moodle, a course-management system.

“It’s a social networking space where students can come together to make a wiki page, a glossary of terms, and lots of other things,” says Brown. Set up by the instructor with links to course notes, assignments, Web resources, and other relevant material, page access is granted to students and guests when appropriate.

This year, Brown has been experimenting with sample quizzes on Moodle for his students, who can take a quiz, which automatically randomizes questions, as often as they want to review for exams.

“I’m hopefully doing paper tests for the last time this year,” he says.

Brown started using both i-clickers and Moodle in his 25th year of teaching, and plans to become more proficient in information technologies to exploit the full extent of Moodle’s capabilities.

“If I can do it, anyone can do it,” Brown says. “We have a great teaching environment here.”