Who needs lectures? Vermont medical school chooses other ways to teach

By Felice J. Freyer GLOBE STAFF FEBRUARY 01, 2017

Students learn through interactive and problem-solving methods at the University of Vermont medical school. (Photo: Caleb Kenna from the Boston Globe)

BURLINGTON, Vt. — The doctors of tomorrow — eight of them — huddle at the conference table, puzzling over the case of a girl whose growth has mysteriously slowed. What could be wrong? A genetic syndrome? An enzyme insufficiency? A brain tumor?

The students have scrawled their hypotheses on adhesive paper stuck to the wall, with other lists of clinical data and, most important, the knowledge they must acquire.

To outsiders, medical school may conjure up images of a cavernous amphitheater with a white-coated, white-haired professor holding forth. But in a small classroom at the University of Vermont’s medical school, the professor has little to say.

This classroom is a pioneer in a nationwide movement to ensure that medical education produces the kind of doctors today’s patients need — physicians who are good at listening, fact-finding, critical thinking, and collaborating.

Toward that end, the school has pledged to eliminate all lectures by 2019.
Nearly all medical schools are reducing lecture time and moving toward these interactive modes of learning. But Vermont’s Robert Larner, M.D. College of Medicine, propelled by a gift from an alumnus, is going the furthest — and the fastest — with its 2019 goal.

“Sometimes, the best approach to something isn’t the most comfortable,” said Dr. William B. Jeffries, senior associate dean for medical education. “Students are comfortable with lectures because they provide them with a guide to material that’s on the test. Faculty are comfortable with lectures because they already did it last year.”

But Jeffries, who loves to lecture and even wrote book chapters on how to do it, said the evidence is clear that “students perform better in an environment where they’re asked to do something instead of listen to something.”

Much of what is taught by a professor merely talking, he said, is forgotten within weeks, and sometimes is obsolete within years.

Lisa Howley, senior director of educational affairs at the Association of American Medical Colleges, said she was unaware of any other medical school pledging to eliminate lectures.

Already, less than half of the learning experiences at Vermont’s medical school take the form of lectures. It’s an upheaval that has variously thrilled and burdened professors and surprised and challenged students, but is one that, university officials say, promises to elevate a new generation of skilled and compassionate physicians.

Medical school has traditionally been divided into two years of classroom learning and two years of clinical clerkships, in which students rotate through health care facilities. Years ago, the University of Vermont shortened the second year, so that students start their clerkships earlier.

Now, the latest innovations focus on those not-quite-two-years of didactic learning, trying several types of teaching methods, with students working in small groups to tackle problems and applying what they know. For example, in a “flipped classroom,” students digest the materials — such as a short video, an animated PowerPoint, or a reading — before coming to class; in class, they gather in groups of six to answer assigned questions.

The eight students contemplating the growth-stunted child were taking a different approach. They were engaged in a “problem-based learning” course for second-year students in which they confront a real-life case with the knowledge they have.

‘If you put all your eggs in one basket and it doesn’t work, it’s hard to retreat from that.’

Major Munson, Julia Powelson, and Matthew Shear took part in a class in Vermont. (Photo: Caleb Kenna for the Boston Globe)
Dr. Douglas H. Hughes, Boston University School of Medicine associate dean, who’s not ready to jump into lecture-free education

In addition to slowed growth, the girl, who was 11, had delayed puberty, abnormally low blood pressure, loss of appetite, and headaches that awakened her at night.

After analyzing the case, each student selected a topic to research for the next class. Then, they came back and taught one other. One student, for example, outlined all the conditions that can delay puberty; another walked through the causes of headaches.

When it came time for a diagnosis, the students used a computer program that links to the child’s medical records (stripped of identifying information), to reenact the investigation of her case. They can request a test, and if the child’s physician had ordered that test, the results will be displayed.

After tossing around several ideas and checking several tests, they agreed the next step was an MRI of her brain. They called up the girl’s MRI results to display on a large screen. One of their hypotheses was unmistakably confirmed: a tumor on the pituitary gland.

The professor, Dr. Patricia A. King, better known as the “faculty facilitator,” said this process promotes lifelong learning and collaboration.

King trains other faculty members in how to run a problem-based learning course. Some find it difficult to give up so much control. Often, she said, the hardest part is “how not to say anything, when you really want to say a lot.” But the knowledge, King said, sticks better when the students discover it on their own.

Julia McGinty, one of the students who diagnosed the 11-year-old girl, said that’s often true — she finds she doesn’t need to review topics she has learned in an interactive format.

Still, she observed, “some topics do better at being adapted to the interactive format than others,” and some students prefer to learn on their own, at their own pace.

Marie Kenney is one of those students. Now in her second year, Kenney didn’t know about the curriculum changes Vermont was planning when she applied. She would prefer more, not fewer, lectures.

“Because my learning style is more solo than group-based, I find that lectures are a lot more valuable to me,” she said. Discussing in class what she has already learned on her own seems redundant.

Soraiya Thura, a third-year medical student and the student representative on the university’s Board of Trustees, said that as professors struggled to learn the new formats, they sometimes stumbled, and the experience fell flat.

But when the classes worked well, Thura said, “I walked out feeling like I had a much better grasp on the information.”

Thura said she felt well-prepared for the first of her medical board exams, the notorious “Step One” that second-year students must pass before they can begin their clerkships.
Jeffries points to evidence that students ace exams after learning with the new methods, including a 2014 review of 225 studies of science, engineering, and mathematics instruction. An internal study at Vermont’s medical school found that test scores went up when team-based learning was introduced.

These efforts have been bolstered by gifts from Dr. Robert Larner, a 1942 alumnus for whom the medical school was named last year. Larner donated $100 million over the past 30 years for medical education and curriculum development.

Last year, the 99-year-old Larner bequeathed $66 million to establish an endowment that, after his death, will provide about $4 million every year to pursue educational reform.

All four medical schools in Massachusetts are reexamining their curriculums and employing alternatives to lectures.

Harvard Medical School introduced a new curriculum in August 2015; now, only one-fifth of teaching hours occur as lectures.

The Tufts University School of Medicine has a mixture of small-group and lecture formats, and is planning a complete curriculum revision.

At the University of Massachusetts Medical School, students shadow doctors starting in their first year and work in teams with nurses and other professionals.

But no Massachusetts medical school is ready to abandon lectures, believing that such presentations are sometimes the best way to deliver certain material.

Dr. Douglas H. Hughes, associate dean for academic affairs at the Boston University School of Medicine, favors a mix of methodologies, to accommodate different learning and teaching styles.

Hughes said other schools are watching how the Vermont experiment goes.

“They’re pushing the envelope, and that’s great,” he said. “It takes courage to be an early adopter.” But Hughes prefers to learn from Vermont’s experience before leaping into lecture-free education. “If you put all your eggs in one basket and it doesn’t work, it’s hard to retreat from that,” he said.

Told of such skepticism, Jeffries, the Vermont dean, said the evidence is clear that students don’t learn well from lectures. Why continue offering them when there are more effective methods?

Lectures are an efficient way to deliver knowledge, Jeffries said. “But knowledge is fleeting. Knowledge is a constantly developing commodity in your brain that needs to be nurtured, developed, and overhauled routinely. That’s the skill that you need your physician to have.”