

Home Dissection Kits and More

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By David Moltz

Science professors are often reluctant to teach their courses online, citing the difficulty of virtually replicating hands-on experience in the laboratory. Nevertheless, the proliferation of do-it-yourself experiment kits that allow online students to do at home almost everything that classroom students can do — including dissect a fetal pig — has won over some long-time critics to the portability of the sciences through distance education.

Many institutions that prepare students for entrance into undergraduate nursing or allied health programs offer relevant prerequisite sciences courses in a hybrid format in which students must do laboratory work on campus under the supervision of an instructor, but can do everything else from the comfort of their home computer. Other institutions offer entirely online courses that attempt to replace this face-to-face laboratory portion with virtually simulated dissections and experiments that proceed only with a click of the mouse (the computer kind). Not surprisingly, there are many critics of this decidedly hands-off method.

“When I was first approached by my department chair and he told me that it was time to start an online emphasis in anatomy and physiology, I was against the idea, probably like most scientists around the country,” said Nahel Awadallah, professor of anatomy and physiology at Johnston Community College, in Smithfield, N.C. “Would you let a nurse near you who had only done simulations on a computer? Click, click, click? That can be used as a supplement but shouldn’t be the only source of instruction.”

Enter the myriad homespun, cardboard-boxed science kits available to educators and their online students. Now, previously detached students are snipping open frog’s intestines with dissection scissors and determining the caloric content of their lunch with a Bunsen burner and a test tube, all on their newspaper-draped kitchen tables.

"I have to say, I was amazed when I saw these kits," Awadallah said. "I couldn't believe they had everything that I would give my students in their anatomy classes on campus: a fetal pig, sheep's eyes, sheep's heart, everything."

At least two companies manufacture these home science kits, aimed at distance educators who teach anatomy and chemistry, microbiology and physics: eScience Labs and Hands-On Labs. The market for these materials is growing, it seems, as students seek more courses online. Hands-On Labs, which sells customizable kits to students called LabPaqs, sold them to 150 institutions last fall.

"This is not baking soda and vinegar," said Linda Jeschofnig, president and chief executive of Hands-On Labs. "These [kits] are not toys and contain potentially dangerous things."

With Hands-On Labs, the institutions are its clients but the students themselves are its customers, and they buy kits directly from the company at an average cost of \$179. In this way, the company — and not the institution — is liable in the event of a student's accidental injury because of an experiment gone wrong. The kits provide enough chemicals and other materials for "micro-scale" reactions and experiments. On average, Jeschofnig said, the kits contain about 2.5 milliliters of chemicals, an amount she insists is "not enough to do anything nefarious."

To the comfort of her clients, Jeschofnig asserts that, in 15 years of business, the company has not had a single claim filed against it. Still, she did note that it has a \$3 million liability insurance policy just in case.

"The liability is ours, and we're happy to accept it because we believe we have a safe product," Jeschofnig said. "Also, a lot of schools don't stock labs anymore. The cost of building them and maintaining them is too much. These are big things for a lot of schools and can help them save money."

Scientists formerly skeptical of online delivery, like Awadallah, have numerous ways to ensure that their students are, indeed, doing the experiments as assigned, besides a thorough review of their lab reports. Some even argue that, without having a lab partner to distract them or dominate the dirty work of conducting an experiment, their students might even learn more online than they would have in the laboratory.

"To evaluate my students, I have them use digital cameras and Web cams," said Penny Perkins-Johnston, anatomy and physiology professor at California State University at San Marcos. "Let's say we're interested in bones. I'll make up a list of instructions, and I'll have my students show me these structures on a short video that they can post online. Every student has to do it and, in that way, they are almost teaching me."

The most prominent issue for instructors who have their students use these home materials appears to be convincing other colleagues and fellow institutions of the rigor of their courses. Many institutions, for example, will not accept science credits in which a student has not done actual lab work but instead done "virtual lab work" on a computer. Now, some instructors are campaigning to ensure that science courses that use home lab kits will not be treated the same way.

"I could eventually see one of our students trying to get into someone else's nursing school and someone at that school saying, 'Oh, this work was all done online; I'm not going to accept that,' " Perkins-Johnston said. "I hope that, if that situation arises, I'll be able to present to those instructors who make those decisions that I believe the work my online students have done is just as valid as the work my classroom students have done. I'm going to make sure it isn't going to be a hassle for my students to get into other programs."

At certain community colleges, at least, these do-it-yourself science lab courses have gained acceptance in a relatively short time.

"All instructors in our department have to teach both online and face-to-face courses," said Jim Brown, microbiology professor at Ocean County College, in Toms River, N.J. "They can really compare and contrast both. We've gone from offering no online science courses to offering 14 in just two and a half years. It's really turned the corner and become accepted."