

# Encouraging Student Engagement in Online College Laboratory Courses

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More and more students are taking [online classes](#), including online laboratory classes. [Survey data](#) gathered by the Integrated Postsecondary Education Data System (IPEDS) in 2012 show that 25.8 percent of all post-secondary students took at least one course online.

With this increase in online education comes the issue of how to keep students engaged and ensure they don't drop a course or stop doing the required work. Some aspects of student engagement are unique to an [online laboratory course](#).

## Tips for Increasing Student Engagement

Students need precise instructions in order to do good work. This requires extra steps from the instructor. In a traditional laboratory course, an instructor can immediately clarify or adjust a step when students are having issues with an experiment.

A clear time frame for completion will help keep students on track. Some experiments are time sensitive, or the lab materials shipped to students are perishable. Details on when each step needs to be completed will allow students to get the most out of the experience.

Help is crucial for both student success and student safety. A message board where students can ask questions of the instructor and each other is extremely useful.

## Getting the Student Experience

Online students miss the physical experience of being in a laboratory, such as the smell of chemicals, the feel of the materials, and the act of performing experiments. Institutions have addressed this by improving the quality of lab materials. The laboratory equipment sent to students is often a miniature or full-scale version of what a student would handle in an on-campus class. The materials sent to a student's home have

to be safe, though limited quantities of standard lab chemicals can be included.

## Solutions for Limitations

There are limits to doing laboratory work at home. Most undergraduate coursework can be done with equipment that can be sent to a home without increasing the cost for the students too much. Higher-level courses require students to use equipment that is too expensive, sensitive, or large to send to a home. There are alternatives available.

- The first and less desirable alternative is to train students using virtual laboratory equipment. Students change the parameters on their computer interfaces, and they can see the results. Students might see this type of simulation as a game. The argument for this kind of class is that in industry, more and more equipment is run this way. An operator uses a terminal to make changes, and the equipment, which might not be in the same room, performs the tests. Still, this is seen as a learning obstacle since the students cannot interact with the equipment.
- As an alternative, some colleges have set up remote laboratories. They have microscopes, chromatography equipment, etc. in an actual laboratory. A student logs in to the server and manipulates the

equipment through a computer interface. On screen, the student will see real-time images of the equipment performing these tasks. Most of the time laboratory assistants are present to perform maintenance duties and assist in troubleshooting. A school must invest heavily in its IT system in order for these classes to run smoothly. Another issue is that a limited number of students can run the equipment at the same time, which may require them to perform experiments at inconvenient times

## Role of the Instructor

The last and one of the most important aspects of student engagement is the instructor. When instructors are engaged with their students and involved in selecting and designing their lab kits, their enthusiasm carries over to their students. This motivates students and encourages them to do well. When students learn new and interesting things, they're more willing to spend sufficient time on their work, and the quality of the work goes up. Thus being an engaging instructor leads to an increase in student engagement.

### Works Cited

Ginder, Scott and Stearns, Christina. (2014). Enrollment in Distance Education Courses, by State: Fall 2012. National Center for Education Statistics. Retrieved from <http://nces.ed.gov/pubs2014/2014023.pdf>

## About the Author

Eddy van Hunnik started as a Distance Learning Specialist in 2014. Before Carolina, and most recently, he taught as an adjunct instructor at several colleges in Boston. He has worked as an educator for Medicare and the Affordable Care Act (ACA), and he developed and managed medical programs at Gibbs College. He holds a PhD in Biochemistry from the University of Amsterdam. He currently teaches courses online.

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