

BMI Teaching Trends Newsletter

Teaching Matters
by Dr. David Evans

Dr. David Evans adapted to the loss of in-person teaching in the 2020/2021 academic year by adopting virtual labs into graduate coursework. BMB 7030, Concepts and Technologies in BMB, is a core course in the BMB M.S. program that focuses on the methods and techniques of biochemical research. In the past, some instructors in this course would bring the students into their own laboratories to give them hands-on experience with some of these methods. Since this was not possible during pandemic, we elected to substitute virtual labs developed by the Danish company, [Labster](#), based in Copenhagen. They offer about 150 simulations primarily on science and engineering topics.

The exercises are reminiscent of a video game with good graphics and a specific task that must be accomplished. For example, the enzyme kinetics simulation asks the students characterize the enzyme causing alcohol flush syndrome and identify possible inhibitors. The setting is a modern, well equipped laboratory in which the students can move freely between different benches and instruments. Each exercise has an associated 'lab pad' which periodically provides detailed background theory, instructions and quiz questions that must be answered correctly before proceeding with the simulation. The quiz scores are automatically recorded in the Dashboard spreadsheet. There is an attempt to make the simulation as realistic as possible, for example when pipetting, you must pick up the pipet, attach a tip, transfer the solution, discard the used tip. A useful aspect is that it is possible to make mistakes that the student must figure out how to correct. There is a cadre of technical assistants available via chat to answer the student and instructor's questions.

While not a substitute for a hands-on wet laboratory, most students thought that the simulations were worthwhile and helped in learning the material. The lab exercises are less costly and do not rely on lab preparation, the availability of expensive instrumentation or teaching assistants.

Dr. Robert Akins collected survey data that showed that most students thought the Labster modules were as good as or better than traditional lectures. A majority of the respondents voted to keep all current modules and some students requested that additional simulations be included in future years to reinforce existing lectures.