Instructional Continuity in the Laboratory Classroom

Disruptions in the classroom can occur for various reasons, such as extreme weather, political unrest, or public health crises. In such instances, you may need to quickly shift your courses online. While you might be prepared to adapt lecture or discussion-based courses, laboratory classes present unique challenges for maintaining continuity. Being proactive and flexible can help you maintain continuity in these environments. Below are tips for keeping laboratory on track during times of disruption that work for synchronous and asynchronous classrooms.

- **Implement virtual simulations**: Virtual simulations can replicate lab processes. You can build your own using tools like H5P, or pre-established platforms such as: PhET, biologysimulations, or LabXChange. If you need to manage capacity limits, consider dividing students into groups that alternate between in-person and virtual sessions

- **Shift the focus to lab thinking skills:** Emphasize the development of lab thinking skills, such as defining problems, designing experiments, interpreting data, drawing conclusions, and communicating results. Tailor the experience to the key learning outcomes of your course. While students may not be able to physically run experiments, this is just one aspect of lab work. You can use case studies, data sets, or collaborative online tools to engage students in these skills remotely.

- **Modify labs to use easily accessible products**: To prioritize the psychomotor domain of laboratory learning, consider modifying labs to utilize inexpensive items or materials that students can easily access. Encourage them to use everyday household items or to observe phenomena in their local environment or online. This approach not only makes lab experiences more accessible but also fosters creativity and resourcefulness.

Resources

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Darrah, M., Humbert, R., Finstein, J., Simon, M., & Hopkins, J. (2014). Are Virtual Labs as Effective as Hands-on Labs for Undergraduate Physics? A Comparative Study at Two Major Universities. *Journal of Science Education and Technology*, *23*(6), 803–814. *https://doi.org/10.1007/s10956-014-9513-9*

Jain, J., & Kaur, M. (2022). Moving Labs out of Labs: Teachers' Perceived Effectiveness of Virtual Laboratories during Pandemic School Closures. International Journal of Information and Education Technology, *12* (11), 1267–1274. https://doi.org/10.18178/ijiet.2022.12.11.1749

For more information or to discuss how you might incorporate these ideas into your courses, contact the Reinert Center by email at cttl@slu.edu.