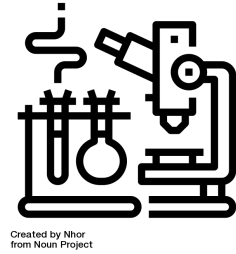


Teaching & Learning Practical Skills Online (Arts, Labs & Trades)



Your Challenge:

1. Find one lab or activity in your course that you would normally teach in a lab or hands-on environment that requires a re-design for an online environment*.
2. Redesign your lab or activity for an online environment. You may want to use the [online lecture plan template](#) or write up the activity using an [assignment template](#). If you are breaking it into smaller components, create the plans for each of those.

*If you don't have any such thing in your course, consider skimming the rest of this Challenge to harvest any cool nuggets or resources you might use, and then feel free to focus your energies on the other challenge for today.

Moving a course online that has a practical skills component may be one of the most challenging scenarios. No, online is not a replacement for an in-person, hands-on experience. And it becomes even trickier when the skill requires machinery or tools that are just not available at home. Your students probably don't have access to hook a hose up to a fire hydrant. They can't clean someone else's teeth if they live alone. You're probably not having students conduct biology labs in their kitchen (although....?). And all the videos in the world aren't going to replace a lived experience.

Still, all is not lost! There **are** some creative approaches you can take. And, there's a couple things we're going to want to consider before diving into brainstorming and planning:

1. What's the situation/expectation?

- a. Are you biding time until a lab opens?
- b. Are you able to temporarily change the requirements of the course?
- c. Will virtual labs be approved?
- d. Can "lab kits" be sent to or picked up by students?
- e. Are there suitable tool replacements?

When considering these questions, get real with yourself, get real with your department, get real with the accrediting body for your trade/industry and consider the circumstances of your students.

Take some time to carefully examine your learning outcomes and determine what it is your students are expected to learn or be able to do rather than look at the way things have been taught in the past and trying to replicate that experience at home or online .

The changes or amendments you make to your course do not have to be forever, but perhaps they are for now and in this time.

2. No person is an island.

Find out what your colleagues are doing - reach out to your department, articulation group or teaching associations. You may even want to turn to Facebook to see if your discipline has started a [group for sharing ideas](#). This is a time for sharing, not isolation. Some schools have “figured it out”, likely, they are pretty proud of that! (And rightfully, so!). Ask if you can connect and learn from what they are doing - hopefully they will share and help you “figure it out” too.

Let's dive into some examples and ways that you can deliver experiential learning online. As a general note, not all of these suggestions/ideas will be appropriate for your subject area, so use your judgment when selecting activities for your students.

Virtual Labs



A virtual lab is a simulated lab environment where students interact with experimental apparatus, allowing the users to perform their experiments or other activities digitally.

Real-Life Examples

- [Distributing random data sets](#) for students to analyze data
- Have students [analyze videos](#) of the lab being performed.

Resources

[BCcampus Virtual Lab Guide](#)

[At-home experiments and virtual labs: how U of T moved lab courses online due to COVID-19](#)

[ChemCollective](#)

[PhET](#)

[HHMI's BioInteractive](#)

[How to Quickly \(and Safely\) Move a Lab Course Online](#)

[Golabz](#)

[MERLOT](#)

[The OpenScience Laboratory](#)

Simulations/VR



Simulations or Virtual Reality (VR) are similar to virtual labs, but in some cases are quite different, so we've separated them out here.

Real-Life Examples

I also know what you're thinking - VR? That seems complicated and expensive. Of course that CAN be the case, but here's an example that is free: [Lifesaver VR](#). In this simulation, the learners learn decision making during a cardiac episode and about CPR. The only requirement is a mobile phone running [iOS](#) or [Android](#). [Google Cardboard](#) is optional but helpful!

Welding and automotive painting students are [using VR](#) at Vancouver Community College. They created the VR applications with a firm in India.

Resources

[Lifesaver VR](#)

Open RN [Links to H5P scenarios.docx](#) - includes Lesson Plans!

[Ryerson Nursing Simulation Games](#)

[Journey North Nursing Educators Resource](#)

Work-Integrated-Learning (WIL)



Work-Integrated-Learning (WIL) is an opportunity for students to apply their learning to workplace and career locations. Instructors and faculty are encouraged to reach out to their Co-op Office, or Career Centre on campus to engage with those staff about how this can be best implemented in your course.

Real-Life Examples

Include a reflective activity that will allow students to consider how their learning from this course aligns with their career goals, or, what skills have they learned in this course that they can apply in their career.

Include a virtual panel discussion or guest speaker in your course - experts from the field, a networking opportunity for students

Connect with a local chamber of commerce or Riipen to include an industry-focused experiential learning opportunity in the classroom, or incorporate assignments that require students to make a connection with an employer/industry partner.

Examples from: [How to Adapt Experiential Learning Activities in the time of COVID-19](#)

- Conducting research remotely for partner organizations, creating marketing content, building websites, digitizing resources or archiving material, or developing virtual programming for cultural institutions looking for alternative ways to engage with the public.
- Taking advantage of your campus as a potential partner. For example, in the past the University of Toronto has tasked first-year engineering students with [finding a way to prevent condensation forming in the walls of the rare book library](#).
- Arranging to have your students connect with their counterparts at an institution outside of Canada to address a global problem, broadening students' perspectives.
- Pairing students remotely with individuals who need support, like seniors struggling with self-isolation or newcomers developing their language skills.
- Taking advantage of platforms like [Riipen](#) to identify industry partners for micro-projects that can be completed remotely.
- Partnering with your local chamber of commerce to identify small businesses needing help. For example, 50 students from York University are [supporting the City of Toronto's ShopHERE program](#), helping 3,000 businesses and retailers build e-commerce sites by August.

Resources

<https://www.riipen.com/educators> Riipen brings real projects from organizations into the classroom. Immersing students in industry projects equips them with work-ready skills. This platform brings industry and academia together, with real company projects that are facilitated by instructors and embedded directly into curriculum.

Resources to support Work Integrated Learning (toolkits and modules) can be found here:

https://www.cewilcanada.ca/COVID-19_Resources.html

DIY



This is an opportunity to get creative and consider everyday objects and supplies that many students will have at home that can help them learn the principles of your course.

Real-Life Examples

When teaching art, consider [focusing on providing feedback and critique](#). You may consider creating more videos or offering Zoom model classes for life drawing.

[Tracking heart rate](#) and collecting and analyzing the data over a period of time.

[Analyzing urine output](#) against a number of different variables.

Animal biology students [design an experiment about local animal behavior](#) and collect and analyze those data. For example, the student who asked whether ants were more drawn to the turkey or the bread when they disturbed her lunch outside.

Measuring temperature in a variety of locations over a period of time. For example, measuring temperature once per hour for 16 hours in 4-8 different locations: your front yard, back yard, in your house, in your fridge and analyzing the data.

[Physics students can build pendulums](#) of varying lengths using home materials and analyze the motion. A key part of the experiment is for students to think through what they need and what limitations their tools introduce.

Have students get a [dental model](#) and practice dental hygiene skills, film the videos and share with peers to have them evaluate each other.

Resources

[Video sharing for learning, business, and sports](#)

[Resources for the Arts and Learning sector during the COVID-19 pandemic](#)

[Remote Teaching Resources for Studio Art and Art History](#)

Focus on “Other” Lab Skills



If the other options aren't feasible or workable, perhaps you'll want to go back to your learning objectives that you've identified related to labs. Do any of these outcomes lend themselves to non-lab activities?

For example, [this article](#), describes how to engage students online in activities related to these five outcomes for lab courses:

1. Learn how to propose new scientific experiments.
2. Learn how to review the literature and critically read peer-reviewed journals.
3. Learn how to design complex research experiments.
4. Learn how to analyze experimental data.
5. Learn by teaching others.

By digging into these types of objectives that don't have direct ties to the "doing" of a lab, you can take advantage of the ability to engage students at a deeper level with these activities.

Real-Life Examples

Chemistry students [design an experimental procedure](#) for the multi-step synthesis of an organic compound. This was used to replace two exams with one project.

Astronomy students [use data](#) found in databases to design an experiment.

Resources

[Five objectives for online science labs that lend themselves to virtual teaching \(opinion\)](#)

[Teaching labs remotely | Center for Teaching | Vanderbilt University](#)

[Open-Access Data and Computational Resources to Address COVID-19](#)

