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# “LABTORIALS” – LABORATORY-FOCUSED TUTORIALS

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**SUBTHEME:** Modes of learning

We have trialed a new type of classroom dynamic to support laboratory learning that we have coined “labortorials” (laboratory tutorial) given their mimicry of traditional tutorials but instead focus on laboratory content. The labtorials were introduced to reduce the cognitive load during experiments (Agustian & Seery, 2017) and retrain students to a benchmark competency that could be built on in higher levels of laboratory teaching. There are no experiments conducted during the labtorials, instead they serve as extensive pre-laboratory activities to train students in the appropriate theory and techniques needed to conduct a targeted experiment.

In our laboratory program, we designed labtorials to support four of our quintessential first year laboratory experiments. The labtorials are delivered as a flipped classroom and consist of a theoretical and a practical component. The theoretical component is delivered as an online module that students can complete in their own time before the laboratory. The practical component is delivered in the laboratory where students are trained in proper laboratory techniques and then allowed to practice the techniques without any consequences affecting an experiment outcome. The students then complete an experiment in the following week that requires them to apply their new-found knowledge and laboratory skills from the labtorial lessons.

In this talk, I will be outlining the structure and delivery of these labtorials including the assessments built around these classes. The perspective of both students and the laboratory demonstrators delivering these classes will also be delivered - their feedback has been influential in shaping the labtorials into the current form. We have found labtorials to be an invaluable addition to our laboratory program and would be translatable to any discipline in STEM.

## REFERENCES

Agustian, H. Y., & Seery, M. K. (2017). Reasserting the role of pre-laboratory activities in chemistry education: a proposed framework for their design. *Chemistry Education Research and Practice*, 18(4), 518-532.

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