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## Evaluation of student learning from a design activity in a physics laboratory course

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As part of a larger goal in revamping the physics undergraduate laboratory curriculum at Queen's University, we have started implementing small changes to some lab courses and are measuring their effects to guide further transformation. For our second-year physics lab course, we have transformed an experiment previously given with a set procedure into an activity where students design the lab. This is the compact disk diffraction experiment where laser light is diffracted from the surface of a compact disk and an estimate of the groove spacing is obtained from measurements of the diffracted light. In the design lab, the students are provided with question prompts and they have to come up with their own experimental procedures. We record the students' voices when they perform the experiment. The audio recordings are transcribed and student behaviors are studied. They are compared to student behaviors in the non-design labs where the students are provided with a detailed procedure. Students' data analysis and reports are also examined to evaluate their learning. We will report our findings in this talk and discuss our plan to implement similar activities over the whole laboratory curriculum, and how to assess its success.

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