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Covid-19 project: What a physics instructor learned by working with engineering coop students to create open problems

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Covid-19 project: What a physics instructor learned by working with engineering coop students to create open problems using WeBWorK

BCcampus has funded a number of projects to increase the use of Open Educational Resources (OER) in the British Columbia. There are initiatives to make either Zero (or low cost) Textbook Credentials. One of the major stumbling blocks to having all first-year textbooks in engineering programs be OER was that lack of a book on Mechanics, both statics and dynamics, that was comparable to the commercially available books. These textbooks contain more than 7000 problems as well as about 1000 worked out examples that use high quality 2D and 3D images. In addition they often come bundled with an online homework system.

UBC Mechanical Engineering had begun creating problems of this level of complexity using WeBWorK. WeBWorK is an open-source on-line homework system for delivering individualized homework problems over the web. It gives students instant feedback as to whether or not their answers are correct. WeBWorK has been used by the mathematics community for decades, but there are not many physics problems in the Open Problem Library (OPL) and very few, less than 100, of the type needed for first and second-year engineering students.

Due to Covid-19 lockdowns this summer, I had spare time on my hands and the Federal Government was providing large subsidies for coop students. A small project at UBC with one engineering professor and two students turned into a larger project with six students. I, a physics instructor at a community college, supervised three of those students as well as working with a professional graphic artist. The project has continued and I am now in my third semester supervising two students. In this January-April 2021 semester, I am teaching the course associated with this project, a first-year physics course in mechanics, both statics and dynamics, geared for engineering students. This is an ongoing project and I invite others to join us in this work.

I will present what I learned about WeBWorK, supervising coop students to create questions, and working with a professor from a large university to create open educational resources.

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