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DEVELOPMENT AND EVALUATION OF A CONTEXTUALISED, ONLINE INTRODUCTORY PHYSICS COURSE

Monday, 1 October 2018 12:30 (20 minutes)

In this talk I will discuss the development of an introductory contextualised online physics course and the methods that have been used to measure its effectiveness. The course, entitled “Everyday Physics”, has been running since 2013. The course consists of twelve topics, one per week, based on everyday objects and phenomena. For example, students learn about thermal physics in topics called “Why does your kettle boil?” and “How does a hot air balloon work?”. Being online, it is very easy for students to disengage as there are no scheduled classes, using contexts relevant to the students has kept them engaged in the course over the semester.

During the course students complete experiments at home with common household equipment and submit reports for marking. In the kettle topic they measure the specific heat of water by timing how long it takes to boil different volumes of water. Lectures are presented as short videos which are available through YouTube. Most lectures comprise of theory which is linked to the relevant phenomenon, demonstrations and worked examples to demonstrate how to solve problems. Each week the students have a set of tutorial problems to solve, worked solutions are provided to them.

The assessment comprises of six experiments students complete at home, four quizzes and a report they write about an experiment they have designed themselves to investigate they physics behind a phenomenon of interest to them. During the course they peer review the reports of their class mates which gives them an opportunity to learn from their classmates about many different applications of physics but also helps build their confidence as they get feedback on their report before submitting the final version to their tutor for marking.

The course has been very popular with students. It is an elective course, not required by any degree program. Over 800 students chose to take this course during 2018, the numbers have been increasing since its introduction in 2013. The participation rate of female students in the course is over 40%. Over this time I have been using the Force Motion Concept Evaluation (FMCE) survey to collect data on the learning gains of students. I have compared this with the learning gains measured in our face-to-face algebra based introductory physics course, taken by around 400 students each year. The learning gains measured in the online course are a little higher than in the face-to-face course.

Apply to be considered for a student award (Yes / No)?

No

Level for award (Hons, MSc, PhD, N/A)?

N/A

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