

Students' Performance, Perception and Attitude towards Interactive Online Modules to Improve Undergraduate Quantitative Skills in Biological Science

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Abstract : Advances in science have made quantitative skills (QS) an essential graduate outcome for undergraduate science programs in Australia and other parts of the world. However, many students entering into degrees in Australian universities either lack these skills or have little confidence in their ability to apply them in their biological science units. It has been previously reported that integration of quantitative skills into life science programs appears to have a positive effect on student attitudes towards the importance of mathematics and statistics in biological sciences. It has also been noted that there is deficiency in QS resources available and applicable to undergraduate science students in Australia. MathBench (<http://mathbench.umd.edu>) is a series of online modules involving quantitative biology scenarios developed by the University of Maryland. Through collaboration with Australian universities, a project was funded by the Australian government through its Office for Learning and Teaching (OLT) to develop customized MathBench biology modules to promote the quantitative skills of undergraduate biology students in Australia. This presentation will focus on the assessment of changes in performance, perception and attitude of students in a third year Cellular Physiology unit after use of interactive online cellular diffusion modules modified for the Australian context. The modules have been designed to integrate QS into the biological science curriculum using familiar scenarios and informal language and providing students with the opportunity to review solutions to diffusion QS-related problems with interactive graphics. This paper will discuss results of pre and post MathBench quizzes composed of general and module specific questions that assessed change in student QS after MathBench; and pre and post surveys, administered before and after using MathBench modules to evaluate the students' change in perception towards the influence of the modules, their attitude towards QS and on the development of their confidence in completing the inquiry-based activity as well as changes to their appreciation of the relevance of mathematics to cellular processes. Results will be compared to changes reported by Thompson et al., (2010) at the University of Maryland and implications for further integration of interactive online activities in the curriculum will be explored and discussed.

Keywords : quantitative skills, MathBench, maths in biology

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