HOW EFFECTIVE ARE ONLINE MATHBENCH MODULES FOR IMPROVING QUANTITATIVE SKILLS IN THE BIOSCIENCES?

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KEYWORDS: quantitative skills, tertiary biochemistry education, online resources

Background and aims

Quantitative skills (QS) have been identified as essential skills for science graduates in preparation for their career (Tariq 2013). However, undergraduate STEM students, particularly those in the Biosciences have a general lack of competency/proficiency in quantitative skills, together with a lack of confidence. This problem has been identified and reported over many years and continues to cause concern (Matthews et al, 2012). The development of educational resources that integrate mathematics and biology has been one of the strategies implemented to address these issues. MathBench interactive online modules were developed at the University of Maryland to increase students' beliefs about the importance of QS in science and to enhance quantitative proficiency in biology (Thompson et al, 2010). The aims of the present study were to determine the effectiveness and impact of the MathBench modules on our students' competency in mathematical skills as well as their perception of the importance and relevance of mathematics to biology.

Design and methods

The Mathbench (Australia) project, revised the original online modules for implementation into biosciences courses in Australian universities*. In this presentation we report on the use of some of the revised MathBench (MB) modules in a first year, second semester, Biochemistry course and a second year, first semester, laboratory course at Griffith University. The MB online modules were used by the students in conjunction with other learning activities specific to each course. Pre- and post-quizzes were used to assess the improvement in quantitative skills, and pre- and post-surveys and focus group sessions were used to evaluate students' experience in the use of these online resources.

Results and conclusions

The majority of students perceived a moderate improvement in their quantitative skills and this was reflected in their performance in the post-quiz compared to the pre-quiz. There was a moderate increase in the number of students who liked mathematics but no change in their perception of the importance or relevance of mathematics to biology. Overall the data collected in this pilot study suggests that the MB modules are valuable resources for providing opportunities to practice and improve students' quantitative skills and for consolidating their understanding of course content.

References

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