Development and implementation of MathBench for Australian Universities to improve quantitative skills of science and mathematics students.

*Office for Learning & Teaching (OLT) Innovation and Development (ID) Priority Project Grant – **Innovative use of technology in learning and teaching***

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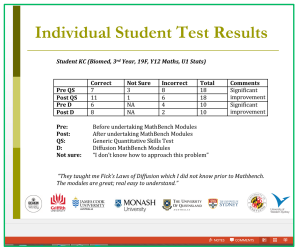
Pilot trials at Deakin and UWS

Two pilot trials were conducted using the Cell Processes modules at Deakin University during its last trimester (T3) in 2014-2015 and the Microbiology modules at University of Western Sydney during its Summer 2014-2015 term. The pilot trials provided preliminary data via student surveys and tests.

At Deakin, the pilot trial was implemented in a Level 3 Cellular Physiology class of 55 students with a mixture of second and third year students doing different degree programs. The modules were used as a supplementary online resource and made available to 29 students who voluntarily participated in the research. Results of this trial will be the basis of a paper that will be presented at the 2015 International Conference on Higher Education (ICHE) in London.


Individual Student Test Results

Student KC (Biomed, 3rd Year, 19F, Y12 Maths, U3 State)

	Correct	Not Sure	Incorrect	Total	Comments
Pre QS	7	3	0	10	Significant
Post QS	11	1	6	18	improvement
Pre D	6	NA	4	10	Significant
Post D	8	NA	2	10	improvement

Pre: Before undertaking MathBench Modules
Post: After undertaking MathBench Modules
QS: Generic Quantitative Skills Test
D: Diffusion MathBench Modules
Not sure: "I don't know how to approach this problem"

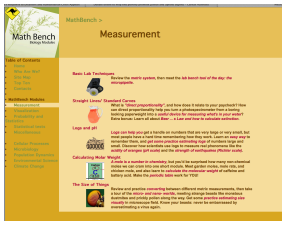
"They taught me Fick's Laws of Diffusion which I did not know prior to MathBench. The modules are great; real easy to understand."

At UWS Microbiology modules were piloted in a Microbiology class with 20 students who are in their second or third year of study. The modules were used as part of assessment and as a supplementary resource. Pre- and post- surveys and module specific pre- and post-tests were implemented. The results of this pilot trial will be presented at the International Conference: Assessment for Learning in Higher Education 2015 to be held in Hong Kong.

The same set of modules will be used in the first semester to a much larger group of students. The time spent on the modules will be tracked via the learning management software, Blackboard.

Contextualised MathBench modules ready for larger trials

Most of the 27 MathBench-US modules the Australian MathBench team targeted for development and contextualisation have gone through the full cycle of the project's workflow system. They will be ready for trials in the first half of 2015. These include modules of the Measurement, Visualisation, Cell Processes and Microbiology focus groups. Deakin University, Griffith University, The University of Queensland, University of Western Sydney and Monash University have identified the modules that they will use across this year's university terms.



How are we using MathBench in our units?

Project team members will use the modules in three different ways. These are (i) as a hurdle requirement, (ii) as part of assessment or (iii) as a supplementary resource. The modules may be integrated into a unit, as an in-class activity, or accessed by the students in their own time and outside classes.

Students will be invited to participate in focus group interviews and pre- and post-surveys that will be used to evaluate students' perception of and experience in using the MB modules.

Module-specific pre- and post-tests will also be used to evaluate the impact of MathBench modules on their QS as applied in the biological sciences.

MathBench-Aus teaming up with CUBEnet/VIBEnet

The MathBench project will culminate with a symposium that will launch the MathBench Australian version of the modules and showcase the project's findings. The team will also present related works by national and international presenters like Kaci Thompson, our project team member from the University of Maryland and leader of MathBench USA team, who has accepted our invitation to be one of our international plenary speakers during this event.

To make the symposium more fruitful and meaningful for a wider range of stakeholders, talks are underway between the MathBench team, Phil Poronnik of CUBENET and Pauline Ross of VIBEnet, for a joint or back-to-back event in early December 2015.

Details of this exciting event will be disseminated in the very near future.

Why MathBench?

"MathBench Biology Modules were designed to integrate quantitative approaches and mathematics more deeply into the introductory biology curriculum in a way that would reinforce biological concepts, increase math literacy, and prepare students to be receptive to more complicated mathematical approaches in upper-level courses" - Kaci Thompson, et al.(2010) citing Nelson et al., 2009.

For more information on MathBench-Australia project you may contact:
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