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

Issue 1 March 2014

March Update

Welcome '*MathBench for Australian Universities*'

A group of science and mathematics academics at the 2012 ACSME conference in Sydney gathered to discuss how they could further support the effort to improve quantitative skills of science students. After months of communication, particularly with some of *QS in Science* project team members including Dr Kaci Thompson from the original MathBench-USA team, Associate Professor Cenk Suphioglu of Deakin University took on the leadership, drafted a proposal with the help of the would-be project team from seven universities, made the submission and now... the *MathBench for Australia* is in its first year of implementation!

'*MathBench*' Project Overview

The project titled "*Development and implementation of MathBench for Australian Universities to improve quantitative skills of science and mathematics students"* brings together twelve cross- disciplinary team members from mathematics and science, representing seven Australian and one international institution. It is supported by a strong Reference Group to provide expert feedback and assist in the dissemination of findings. The overall project aim is to develop and implement MathBench as an innovative online resource to improve QS of science students at seven Australian universities. To achieve this aim, the MathBench Australia team needs high-level collaboration to modify and adapt the modules into Australian context, ensuring the seamless integration of maths into science and science into maths. The modules will then be trialled among partner institutions and will be evaluated via surveys and interviews of students and academics.

First Project Meeting

Getting down to business, the first MathBench project meeting was held at the University of Sydney on 14 February. The first part had the team listening to three invited speakers: Kelly Matthews (the project's external evaluator), John Rice and Pauline Ross (members of the project's Reference group); the second part was discussion of project matters. Kelly and John urged the team to (i) build on its strengths by trying to understand and relate to each other (capacity building), (ii) understand the real need of its stakeholders (context), and (iii) know the products that it needs to deliver (deliverable). Pauline, on the other hand, shared her experiences on using MathBench and other modules which she said can be effective tools in bringing students from the left to the right side of the 'passing' curve. The second part of the meeting was spent on module allocation and some details of module development.

Dissemination Materials released

Thanks to the Deakin University's Design Team, the project's first postcard and flyer are now out and ready for distribution. The postcard was distributed during the UniServe meeting at the University of Sydney while the flyer (attached with this Newsletter) will be used to create awareness and seek engagement with other colleagues and other stakeholders.

Next Steps…

The team is now preparing to take on the first major deliverable of the project: drafting and polishing MathBench modules adapted to Australian context by July 2014. Eight focus groups were formed based on team members' expertise with each group composed of two to three scientists and one mathematician. The 34 modules were then divided among the groups based on theme or focus. Our aim is not only ensuring that the science and the maths are correct but to also take on the challenge of developing and exhibiting the best collegial working relationship among the scientists and mathematicians in the team and overcoming the barriers claimed to prevent genuine integration of maths in undergraduate science units.

In the background, we are preparing our ethics application and developing the site map for the project's website (www.mathbench.org.au) due for launching in April.

Exciting times ahead!

MathBench quotes

> *MathBench Biology Modules represent one example of how biology educators can incorporate materials to improve quantitative skills and reasoning into introductory courses. As the materials are stand-alone in nature and freely available, educators can utilize the materials as needed and experiment with implementation of the modules.*
>
> *Modules are written in an accessible style, making them appealing and easily understood. The modules are succinct, are hosted online (http://mathbench.umd.edu), and can be completed within students' schedules. Biology educators can use the modules in a number of ways, such as during a class presentation to reinforce selected concepts, as a pre-lab activity, or as an intervention for students needing assistance to become proficient in essential quantitative skills*

Source: Feser, J., Vasaly, H., & Herrera, J. (2013). On the edge of mathematics and biology integration: Improving quantitative skills in undergraduate biology education. CBE-Life Sciences Education, 12(Summer), 124–128. doi: 10.1187/cbe.13-03-0057, p124.

Another undergrad teaching tool

Something to consider when teaching undergraduates maths and statistics, and no doubt a valuable tool for US lecturers committed to Vision and Change, are the online MathBench modules…

Source: Chris Cook: http://blog.garnetcommunity.org.uk/category/teaching-resources/

For more information on MathBench-Australia project you may contact: A/Prof Cenk Suphioglu, project leader, at cenk.suphioglu@deakin.edu.au or Ms Vilma Simbag, project manager, at vilma.simbag@deakin.edu.au