

STUDENT USAGE OF ONLINE MATHS SKILL SUPPORT IN FIRST YEAR CHEMISTRY

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Background and Aims

In recent years, a range of maths support centres and online approaches have emerged (Croft, 2000; Jackson & Johnson, 2013) that are often stand alone and not embedded within any specific discipline. Nonetheless, studies have shown that students reported a positive impact of mathematics support on retention, confidence, performance and ability to cope with the mathematical demands of their courses (Ní Fhloinn et al., 2014). In a more tailored approach, the Maths Skills programme developed at LaTrobe University (Jackson and Johnson, 2013), is an extra-curricular programme that supports large enrolment first year courses with a diverse cohort of students, offering the choice of learning modes – online delivery, worksheets and drop-in sessions. Based on the Maths Skills programme, we introduced a purely online mathematical support environment, termed the *Maths Skills Site*, which was integrated into the first year chemistry curricula. This study aimed to understand student engagement with purely online mathematical support through analysis of user tracking and patterns.

Design and methods

The *Maths Skills Site* was linked to a first year, first semester, chemistry course via the student online learning management system and available for the duration of the course. Topics that students previously (and repeatedly) had difficulty in performing (e.g. exponents), were available for student use and included: mathematics in chemistry theory notes, questions, answers and multiple-choice online questions. Statistics tracking was enabled in the Learning Management System of the Chemistry course which allowed us to determine the use of the individual items on the *Maths Skill Site* (e.g.: Logarithms notes, logarithms questions, etc.) as well as the number of 'hits per content area'. Use of the site was recorded from the point at which the site was initially made public to the student cohort, until the end of semester exam (Weeks 4-16 in 2014; weeks 2-16 in 2015). Access to the site was mapped against (a) the semester chronology and (b) the hit count on the site by individual students. All student usage data was de-identified, and aggregated for analysis.

Results and Conclusions

Analysis of the user statistics tracking system indicated a distributed usage for the *Maths Skill Site* throughout semester, which formed a 'peak and trough' pattern. This type of usage of the resource by students was suggestive of 'in the moment' responses and a 'just-in-time' study for assessment. The analysis of usage data indicates a preferred usage by some students for the notes (suggestive of passive learning) and a preferred usage by other students for the multiple-choice online problems (suggestive of interactive learning). Few students made use of the questions and answers (deep approach). Students who were already confident with their abilities tended not to use the support site. Students who accessed the site used a self-directed approach, choosing to tailor their individual learning within the *Maths Skill Site*.

References

- Croft, A.C., (2000). A guide to the establishment of a successful mathematics learning support centre. *International Journal of Mathematical Education in Science and Technology*, 31(3), 431-446.
- Jackson, D. C. & Johnson, E. D., (2013), A hybrid model of mathematics support for science students emphasizing basic skills and discipline relevance, *International Journal of Mathematical Education in Science and Technology*, 44(6), 846-864.
- Ní Fhloinn, E., Fitzmaurice, O., Mac an Bhaird, C. & O'Sullivan, C., (2014), Student perception of the impact of mathematics support in higher education, *International Journal of Mathematical Education in Science and Technology*, 45(7), 953-967.

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