

# Diversity in large classes: The challenge of providing self directed formative learning



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First year science courses at the University of Auckland face a number of common challenges which impact on course design and learning support for individual students. The large student cohorts (> 1100) entering courses are not only diverse in future program choices but also in their educational backgrounds. Opportunities for formative learning have been developed through the web environment using the university's "in house" learning management system *Cecil*, and *Bestchoice* (an interactive learning portal). <http://bestchoice.net.nz> (Woodgate and Titheridge 2006). These formative learning activities have been integrated into existing course designs (Gunn & Harper 2006) to support diversity in learning strategies and learning styles while enabling all students to develop a sound body of knowledge essential in the discipline of Science. Teachers across the disciplines of Chemistry and Biological Sciences maintain a professional dialogue about learning developments. There is an overlap of the order of 80% across the Biology and Chemistry cohorts. Where it is appropriate, similar technologies are used. This commonality between courses results in improvements in students' learning outcomes. This is part of teaching reflective practice which is currently influencing future developments.

Challenges include:

- Diversity in educational and cultural backgrounds of students
- Diversity of assessment processes in New Zealand secondary schools which qualify students for entry to university
- Diversity of preparedness for tertiary science
- Variation in achievement levels of relevant science subjects and previous science subjects studied
- Diversity of language skills
- First year experience and transition to tertiary education
- Range of motivation, expectations and goals of students

Self directed formative learning strategies implemented:

- Mastery learning through online quizzes with explanations and corrective feedback to address misconceptions
- Online quizzes which include feedback for extension to encourage research and reading
- Online quizzes which provide "just-in-time" feedback to learner and teacher
- Rewards and incentives built into online tests to maintain motivation
- Online pre-laboratory activities
- Online 'tutorial' modules including feedback to provide 'one-on-one' support at remedial, course and extension level.

Keywords: Course design, formative learning, preparedness for tertiary science, mastery learning, pre-lab activities, assessment process, learning outcomes

## References

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**Please cite as:** Harper, M. & Brittain, J. (2007). Diversity in large classes: The challenge of providing self directed formative learning. In *ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007*. <http://www.ascilite.org.au/conferences/singapore07/procs/harper-poster.pdf>

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