

ONLINE QUIZZES IMPROVE LEARNING OUTCOMES IN UNDERGRADUATE FIRST-YEAR CHEMISTRY

Kieran F. Lim^{a,b}

Presenting Author: Kieran Lim (kieran.lim@deakin.edu.au)

^aSchool of Life and Environmental Sciences, Deakin University, Burwood VIC 3125, Australia

^bAlfred Deakin Research Institute, Deakin University, Burwood VIC 3125, Australia

KEYWORDS: Formative assessment; mastery learning; online assessment

ABSTRACT

'Practice makes perfect; bad practice makes perfectly bad' (Rozinszky, n.d.). Practice, study and revision without guidance and feedback is not effective; effective study, revision and learning requires guidance (Ericsson, Krampe, & Tesch-Romer, 1993).

Online quizzes delivered via learning management systems provide opportunities for formative assessment with immediate feedback (Lowry, 2005; McLoughlin, & Taji, 2005). Such quizzes, drawing on question banks of thousands of questions have been in use in first year undergraduate chemistry at the author's institution for over six years. The use of a library containing thousands of questions incorporates elements of mastery learning (e.g., Bearman & Russell, 1987) as students have multiple attempts of each quiz; it is estimated that students can repeat each quiz up to 6 times before there is significant repetition of questions.

While early online quizzes were limited to multiple-choice questions, modern learning management systems permit the use of many types of questions, including fill-in-the-blank, matching, numerical calculation, and ordering a list. Some exemplars of online quiz questions will be presented. Statistical analyses show strong correlation between quiz performance and the final unit result, as well as a good correlation between the number of quizzes attempted and the final unit result.

This research has human research ethics approval (DUHR EC 29 2008 and DU- STEC 23 12 LIM).

REFERENCES

- Bearman, R. J., & Russell, R. A. (1987). A generalist chemistry major for liberal arts and science degrees. *Journal of Chemical Education*, 64(8), 703-706.
- Ericsson, K. A., Krampe, R. T., & Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100, 363-406.
- Lowry, R. (2005). Computer aided self assessment – an effective tool. *Chemistry Education Research and Practice*, 6(4), 198-203.
- McLoughlin, C., & Taji, A. (Eds.). (2005). *Teaching in the Sciences: Learner-Centered Approaches*. New York: Haworth Press.
- Rozinszky, J. (n.d.). 9th Dan Taekwondo Grand Master. Private Communication.

Proceedings of the Australian Conference on Science and Mathematics Education, Australian National University, Sept 19th to Sept 21st, 2013, page 45, ISBN Number 978-0-9871834-2-2.