

Chapter IX

Using E-Learning to Transform Large Class Teaching

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Abstract

This chapter describes a seven-year, incremental process of e-learning development within science courses at a large research university. The process was driven by common challenges in higher education: increasing class size and diversity, limited resources for teaching, and concern about poor alignment with graduate capability requirements. Following a design-based research approach (The Design Based Research Collective, 2003), each stage of development was grounded in appropriate educational theory and implemented using the best available technology. The impact was monitored through surveys, performance records, system log data, and reflective discussion among teachers and students. The revised educational model increased learner autonomy and choice, integrated classroom teaching and e-learning activities, and put explicit focus on learning strategy development. Implications for faculty development and institutional

culture change are identified, as these emerged as significant factors. The chapter concludes with reflections on the scale of the transformation that took place, key challenges faced during the process, and issues yet to be addressed as development continues.

The E-Learning Development Context

First year science courses faced a number of common challenges in the mid-1990s. Student numbers grew rapidly while educational and cultural backgrounds diverged. General first year courses had to serve the needs of different faculties and major subjects, and no formal teaching development strategy supported a shift toward e-learning. Physical teaching spaces were designed for a transmission model of teaching, and any innovation tended to be driven by isolated individuals in low status positions working with limited resources for trials or pilot projects. The traditional lecture-centered model of instruction was struggling to cope with the rate of expansion, while funding and staffing levels were decreasing in relative terms. The quality of student learning and support was compromised by class sizes growing toward 1,000 per semester and the inability of the predominant teaching model to accommodate individual differences. Teaching methods created a culture of dependency, which was at odds with the graduate attributes published by the department and by the university. A crisis point approached as non-completion rates rose and average grades fell. The impact on teachers was equally undesirable. The weight of numbers and institutional pressures limited their ability to apply principles of good teaching practice and offered few incentives for innovation. These factors, coupled with poor student performance, had a negative impact on morale and ran contrary to the emerging international trend of teaching innovation fuelled by the evolving phenomenon of e-learning capability. The simple definition of e-learning used in this context is any learning task or activity that is delivered or mediated through computers and/or the Internet.

Early Trial with E-Learning

Early trials using an online learning management system to streamline administration, communication, and formative assessment functions proved remarkably successful. Evidence produced by the heuristic, design-based research approach showed that reconceptualization of the course delivery model with

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