Chapter XIX

Moving Toward the Digital Learning Environment:

A Hong Kong Example of an E-Learning Management System

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Abstract

This chapter reports on a case study that examines the process of implementing an e-learning management system (ELMS) for learning science in secondary schools in Hong Kong. It describes the challenges, issues and problems associated with creating science content and then integrating it with both a diagnostic and an open-content marking tool. The study had two broad objectives: (1) to analyze and document the process of designing and implementing the ELMS and (2) to evaluate the overall impact of these practices. To achieve its purpose a team of instructional designers worked closely with content and technology experts to digitize science content for online delivery. The system facilitates timely and dynamic diagnosis of student weaknesses. It is argued that when teachers are actively involved in an implementation of a technology-rich environment, they begin to see the benefits of teaching science differently. Given the opportunity to use the online system, students also tend to take

more responsibility for their own learning. Data from participants indicate that the ELMS provides added value to the teaching of science. Lessons learned from this case study should assist others who wish to implement similar systems in the future.

Introduction

A common observation amongst teachers in Hong Kong secondary schools is that there is a great demand for online content development, which needs to be linked to an efficient assessment mechanism in secondary science. In this chapter, experiences are shared to assist future efforts in implementing an e-learning management system (ELMS) in secondary schools for other curricula areas besides science. An account is provided of how a curriculum innovation was conducted in four secondary schools to establish a valid and reliable measuring tool for knowledge components and problem-solving skills when learning science. Information is also provided on how the use of engaging and cognitively demanding computer-based curricula could be applied to promote academic achievement among students who are currently not well served by the predominantly teacher-centred methods.

The case study incorporated a collaborative strategy, which leverages the wide range of expertise from a team of faculty instructional designers, science teachers, science experts, government school inspectors, and technology experts. It explored the process of expanding teachers' pedagogical practices to include the use of new models of online learning using an e-learning management system. This system includes the use of online assessment and profiling tools to monitor students' learning.

The objectives of the study were:

- To analyze and document the process of designing an ELMS to teach science content which incorporates tools for online assessment
- To provide science content that is mapped onto discrete skill outcomes
- To develop dynamic assessment systems that can provide detailed profiles of student learning
- To identify the challenges and issues that instructional designers face.

Partners involved in this study embraced the notion that learning environments where teachers could offer flexible and customisable opportunities to transform science instruction could provide windows on knowledge integration in the making (Barab & Luehmann, 2003). If curriculum materials could take advantage of new technologies, then these same technologies could be applied for innovative assessments (Linn, Davis & Bell, 2004, p. 7).

Analysis of data from this study could make an important contribution to the practice of instructional design. By applying theoretical constructs to the development of the online learning tools, the results from this research could be used to inform educators and policy makers about some of the considerations involved when designing online learning environments.

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