Chapter 1.15
Online Problem-Based Learning Approach in Higher Education

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INTRODUCTION

This chapter begins with a brief review of the history of problem-based learning (PBL) integrated with online learning, and surveys relevant learning theory, including constructivism and cognitivism. Recent case-study research on a postgraduate diploma module in learning and teaching for faculty and lecturers in higher education is then provided to illustrate the key issues for both faculty and students in this evolving area. Emerging trends in combining PBL and online learning are outlined, along with potential opportunity to continue to research the topic in a different light. The chapter concludes with an overview of the research area, aspects of which have been confirmed as strengths, and others that have been highlighted for change.

Online learning in higher education is a relatively young field that is still being defined as a discipline. As faculty members wrestle with decisions about how to structure online courses for collaborative, connected learning, student perspectives of successful courses can provide valuable insights for decision making. While online learning offers students many advantages over campus-based learning, problems do exist. One such problem is the attrition rate of online learners, brought about in large part by a sense of isolation. One teaching-learning model, which can ameliorate this sense of isolation, is problem-based learning.

HISTORICAL PERSPECTIVE

Problem-based learning originated in medical schools based on seeking solutions to real-world problems. Through working cooperatively in groups, thinking critically, and finding and using learning resources, PBL encourages students in their learning and provides faculty with an innovative method of teaching. In general, PBL is a method of instruction that uses problems as a context for students to acquire problem-solving skills and basic knowledge. Vernon and Blake (1993) further characterize PBL as the study of real or hypothetical cases in small discussion groups

engaged in collaborative, independent study using hypothetico-deductive reasoning with a style of faculty direction that concentrates on group process rather than provision of information.

In terms of the history of PBL in higher education, Boud and Feletti (1991) suggest that "the notion of problem-based learning is not new; it was the way in which learning took place before the advent of classrooms and curricula" (p. 6). They further argue that the "newness" lies in the way that learning has been linked to professional practice to allow the development of "highly competent practitioners who have the ability to continue to learn effectively throughout their lives" (p. 6). Certainly, the origins of problem-based learning, and its continuing focus, lie in the education of professionals. While the introduction of problem-based learning in the mid-1960s is credited to staff in the medical school at McMaster University in Canada, it is noted that soon after, three other medical schools—the University of Limburg at Maastricht in the Netherlands, the University of Newcastle in Australia, and the University of New Mexico in the United States—adapted the McMaster model of problem-based learning, and that from these four institutions sprang one of the more important higher educational movements of the 20th century.

Linking PBL to online learning, Albion and Gibson (1998) argue that "PBL has not been widely reported as an instructional design for interactive multimedia (IMM), almost certainly due to the emphasis on group interaction as a component of typical PBL implementations and the individualized nature of IMM." There is, however, a growing collection of papers reporting research and projects that explore the possibilities for instructional design based on the principles of constructivism. With many of the features of PBL recognizable as central to social constructivism, it is reasonable then to argue that the design of online environments and interactive multimedia to support a constructivist philosophy could well be adaptable for problem-based learning.

In support of the connection made between PBL and constructivism, Savery and Duffy (1995) present a case for an instructional model for problem-based learning embedded in a constructivist framework. To support, enhance, or deliver problem-based learning in the online environment, the elements of problem-based learning identified as "essential" by Barrows (1986) must be considered, and it would seem sensible to expect that a modification of the PBL approach might be made in line with the constraints of the online environment and that technology should be designed or adopted to encompass these essential elements.

Certainly amongst Barrow's list of PBL essentials, there are a number that emerge as problematic when face-to-face teaching is not in place. There is an expectation that discussion, and cooperative and collaborative activity, will continue within groups during the resolution of a particular problem. Additionally, for students to progress to deeper levels of thinking, critical analysis of aspects of the problem and possible solutions, and the comparative evaluation of personal understandings against those of others, are seen as essential, as are other metacognitive processes. The role of the tutor or facilitator to question, encourage, and support students so that they develop the necessary reflective and critical thinking skills is of paramount importance. It is necessary, then, to be able to answer with a technological solution the question of, "What form of online environment might be created to support these essential processes?"

A search of the literature and the World Wide Web (WWW) would identify that there is a relatively recent wealth of examples of PBL being conducted online to varying degrees. McMaster University undertook a literature review in 2001 to examine research papers that studied the use of computer-mediated communication (CMC), problem-based learning, and/or collaborative learning in higher education. Their database of articles was developed as part of a larger research study.