



## **Chapter XV**

# **Using Problem-Based Learning in Online Courses: A New Hope?<sup>1</sup>**

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### **Abstract**

*In this chapter, I argue that instructional designers must use research and theory to guide them to new and justified instructional practices when designing e-learning. I introduce a well-established pedagogy, problem-based learning (PBL), in which complex, ill-structured problems serve as the context and stimulus for learning, and students work collaboratively to understand the problem and learn about the broader related concepts. I describe the structure of PBL and discuss Barrow's (1998) concept of "authentic" PBL. I then review the support for PBL in the research literature and describe its relationship to cognitive and constructivist learning theory. I conclude the chapter by demonstrating how authentic PBL can be applied to e-learning using supporting examples from an undergraduate online course in agriculture.*

## Introduction

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Nichols and Anderson (2005, para. 12) make two important points about instructional design for e-learning:

1. E-learning pedagogies must be defensible, used with reference to proven educational practice and theory.
2. E-learning pedagogies are evolving. E-learning practice must make the most of new opportunities.

In designing e-learning, instructional designers must use research and theory to guide them to new and justified instructional practices. In this chapter, I examine the use in e-learning of a well-researched pedagogy, problem-based learning (PBL), in which complex, ill-structured problems serve as the context and stimulus for learning. PBL contrasts with traditional subject-based approaches where students are taught a body of knowledge and then asked to apply what they have learned to sample problems. Students work collaboratively to identify what they need to learn to understand the problem and learn about the broader concepts related to the problem. PBL, therefore, encourages active participation by immersing students in a situation, requiring them to define their own learning needs within broad goals set by faculty and search for the knowledge needed to approach the problem.

PBL was developed in the 1960s and used most widely in medical education. However, it has also been employed in such fields, as nursing, dentistry, and agriculture (Barrows, 1996, 1998; Boud & Faletti, 1991; Savory & Duffy, 2001). Research on PBL has focused on comparing PBL methods to more traditional instruction (Albanese, 2000; Albanese & Mitchell, 1993; Colliver, 2000; Smits, Verbeek, & Buissonjé, 2002; Vernon & Blake, 1993), rather than on the specific learning processes occurring in students engaged in PBL (Norman & Schmidt, 1992) or on the applicability to an online, distance education context, although there has been some recent work on what has been termed distributed problem-based learning (dPBL) (e.g., Barrows, 2002; Björck, 2002; Lehtinen, 2002; Lopez-Ortiz & Lin, L., 2005; Lou, 2004; Oliver & Omari, 2001; Orrill, 2002; Ronteltap & Eurelings, 2002).

Before we can consider PBL as viable for use in e-learning, we need to understand what it is. Therefore, I will begin with criteria for “authentic” PBL developed by Howard Barrows (1986, 1998), originator of the method, and present an example of how PBL is typically structured in face-to-face instruction.

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