What Is Problem-Based Learning?

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There are many strategies instructors can use to engage their learners in meaningful learning. One approach, problem-based learning, has its roots in medical education. It was first introduced in the 1950s at Case Western Reserve University. Faculty preparing doctors needed a way to support students' ability to apply professional skills and knowledge in real-world contexts. Problem-based learning influenced the instructional approaches and curriculum used in medical schools by challenging medical professionals to help their students apply their content knowledge to real medical cases. This methodology, eventually called "problem-based learning," was officially adopted as a pedagogical approach at Canada's McMaster University to promote students' ability to

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apply their scientific knowledge to clinical situations (Neufeld & Barrows, 1974). The model spread to academic programs for law, business, and education. Currently problem-based learning is used as the predominant approach to learning at various institutions of higher education around the world including the University of Delaware, Maastricht University in the Netherlands, Gadjah Mada University in Indonesia, and the University of Limerick in Ireland.

Problem-based learning (often referred to as "PBL") is also the name for an established instructional model of teaching that challenges students to learn and apply knowledge of content through the application of problem-solving skills to solve meaningful problems in the academic disciplines (Kilbane & Milman, 2013). It consists of the following four phases:

1. "present or identify the problem,
2. develop a plan for solving the problem,
3. implement the plan for solving the problem, and
4. evaluate the implementation plan results" (Kilbane & Milman, 2013, p. 285).

This model is intended to be used by educators at all educational levels and settings to build learners' problem-solving skills while also solving a problem.

Another approach with the same abbreviation, "project-based learning" (also referred to as "PBL"), has also become popular in many educational settings. Project-based learning is a method to promote students' engagement in the learning process through the structuring of learning around the accomplishment of projects or tasks that have meaning and relevance for the learner. In this type of learning, students have a great deal of say about the projects they will work on and how they will work on them. Although project-based learning shares much in common with problem-based learning, they are two distinct models of learning. In both models, instructors motivate students by centering learning on the accomplishment of a meaningful goal. In problem-based learning, that goal is solving a problem. In project-based learning, the goal is completion of a project. Table 1 compares these two learning models.

How Can Online Educators Use Problem-Based Learning?

There are many ways in which online educators can use problem-based learning. It can be employed as a major problem that takes a long period of time for students to solve (e.g., over the course of an entire semester), or it can be used during a shorter period of time (e.g., one lecture). Often PBL is incorporated as a case. There are many case-related resources available online. A key feature of problem-based learning is identifying a "good" problem for learners to solve. Problems are chosen or developed by the instructor to correspond with learning goals and objectives. According to Schmidt, Rotgans, and Yew (2011), good problems have certain characteristics, which are:

- ill-defined—the problem has multiple solutions or ways to solve it. There is no single, obvious answer or solution;
- authentic—the problem might be encountered in real life, for example figuring out which apps to purchase for a set of iPads or developing a proposal for designing an online workshop; and
- engaging and interesting—the problem is engaging and interesting, involves students in the learning process, and motivates them to want to learn more, for example creating travel guides for a target location and audience in a course that will be used for a friend's destination wedding.

Table 1. Problem-Based Learning Versus Project-Based Learning

Problem-Based Learning (PBL)	Project-Based Learning
Problem-based learning emphasizes applying existing skills and knowledge.	Project-based learning emphasizes developing new skills and knowledge.
Problem-based learning's main motivation is solving a problem.	Project-based learning's main motivation is completing a project.
Problem-based learning may or may not involve completing a project.	Project-based learning may or may not involve solving a problem.
The teacher develops the problem, but students get control over how to solve it.	Students have a great deal of control over developing the project and the process for accomplishing it.
Problem-based learning provides opportunities for students to develop problem-solving skills.	Project-based learning can provide opportunities for students to develop problem-solving skills but always provides students opportunities to learn to manage the tasks involved in completing a project.
Interdisciplinary nature of problems is stressed.	Project-based learning can be interdisciplinary.
Students may work alone or in groups.	Students may work alone or in groups.
Teachers develop the tools used for assessment.	Students have a great deal of control over the development of tools for assessment.
An important by-product is learning to solve problems.	An important by-product is learning to manage complicated tasks and maintain focus.
Students are provided with resources rather than answers.	Students are supported with resources.
Problem-based learning is meaningful to the learners.	Project-based learning is meaningful to the learners.
Problem-based learning can vary in duration depending on the problem.	Project-based learning can vary in duration depending on the project.
Problem-based learning can be accomplished in groups, cooperative groups, or alone.	Project-based learning can be accomplished in groups, cooperative groups, or alone.

Source: Kilbane and Milman (2013, p. 283).

The use of problem-based learning in online settings provides instructors with an approach to designing instruction that provides learners with authentic, real-world learning experiences.

References

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