What Is Problem-Based Learning?

Institute for Transforming Undergraduate Education
University of Delaware
Characteristics Needed in College Graduates

High level of communication skills
Ability to define problems, gather and evaluate information, develop solutions
Team skills -- ability to work with others
Ability to use all of the above to address problems in a complex real-world setting

Quality Assurance in Undergraduate Education (1994)
Wingspread Conference, ECS, Boulder, CO.
What Is PBL?

“The principal idea behind PBL is that the starting point for learning should be a problem, a query, or a puzzle that the learner wishes to solve.”

“...careful inspection of methods which are permanently successful in formal education...will reveal that they depend for their efficiency upon the fact that they go back to the type of situation which causes reflection out of school in ordinary life. They give pupils something to do, not something to learn; and if the doing is of such a nature as to demand thinking, or the intentional noting of connections; learning naturally results.”

John Dewey (1916)
PBL is…

“…a process of acquiring understanding, knowledge, skills and attitudes in the context of an unfamiliar situation, and applying such learning to that situation.”

- C. E. Engel, University of Newcastle
What are the Common Features of PBL?

Learning is initiated by a problem.
Problems are based on complex, real-world situations.
All information needed to solve problem is not given initially.
Students identify, find, and use appropriate resources.
Students work in permanent groups.
Learning is active, integrated, cumulative, and connected.
PBL: The Process

Resolution of Problem;  
(How did we do?)

Integrate new Information;  
Refine questions

Reconvene, report on research;

Research questions; summarize; analyze findings

Presentation of Problem

Organize ideas and prior knowledge  
(What do we know?)

Pose questions (What do we need to know?)

Assign responsibility for questions; discuss resources
The Problem-Based Learning Cycle

Overview

Problem, Project, or Assignment

Group Discussion

Research

Assessment (when desired)

Group Discussion

Min-lecture (as needed)

Whole Class Discussion

Preparation of Group “Product”
A Typical Day in a PBL Course
Factors in Choosing a Model

Class size
Intellectual maturity of students
Student motivation
Course learning objectives
Instructor’s preferences
Availability of peer facilitators
Common Classroom Models

• Medical school
• Floating Facilitator
• Peer Facilitator
• “Hybrid”
Medical School Model

- Dedicated faculty tutor
- Groups of 8-10
- Very student-centered environment
- Group discussion is primary class activity

A good choice for
- Highly motivated, experienced learners
- Small, upper-level seminar classes
Floating Facilitator Model

• More structured format: greater degree of instructor input into learning issues and resources
• Group size: 4

A good choice for
• Less experienced learners
• Classes of all sizes

• Instructor rotates through groups: Asks questions, directs discussions, checks understanding
• Other class activities:
  – Groups report out
  – Whole class discussions
  – (Mini-)lectures
Peer Facilitator Model

Advanced undergraduates serve as facilitators

- Help monitor group progress and dynamics
- Serve as role models for novice learners
- Capstone experience for student facilitators

A good choice for

• Classes of all sizes
Dealing with Large Classes

Floating facilitator or peer facilitator models are the most appropriate.

Requires a more teacher-centered, structured format: instructor directs group activities

Group size: 4

Reduce grading burden through group (vs. individual) papers, projects
“Hybrid” PBL

• Non-exclusive use of problem-driven learning in a class
• May include separate lecture segments or other active-learning components
• Floating or peer facilitator models common

Often used as entry point into PBL in course transformation process
Good PBL Problems...

• relate to real world, motivate students
• require decision-making or judgments
• are multi-page, multi-stage
• are designed for group-solving
• pose open-ended initial questions that encourage discussion
• incorporate course content objectives, higher order thinking, other skills
Reflections and Questions