Writing Effective PBL Problems

Courtesy of
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Step One:
Identify Learning Objectives

Think of a learning objective in your course.

How do you usually address this learning objective? What kind of problem or activity do you usually assign?

– Typical end-of-chapter problem?
– A reading?
– Other?
Example from Physics: Solving Problems Using Conservation of Momentum

Traditional examples:
• Pool balls colliding
• Bullets hitting blocks of wood
A 1500-kg car traveling east with a speed of 25 m/s collides at an intersection with a 2500-kg van traveling north at a speed of 20 m/s. Find the direction and magnitude of the velocity of the wreckage after the collision, assuming that the vehicles undergo a perfectly inelastic collision (i.e., they stick together).

Types of Learning Objectives

**Content-oriented:** subject specific
- Basic knowledge and understanding of specific concepts, techniques, etc. in the discipline

**Process-oriented:** global skills
- Effective communication: oral and written
- Acquiring and evaluating information
- Working effectively with others
- Higher order, critical thinking
Step 1: Writing Learning Objectives

- Identify several learning objectives for your PBL development; consider both content and process goals.
- Traditionally, how might these learning objectives be addressed? What kind of problem or activity would you assign?
Step Two:
Identify Real-World Context

Name a realistic application of the concept.
Outline a scenario.

Ideas:
• Add story-telling to end-of-chapter problem.
• Add motivation, require students to go beyond rote learning, do research.
• Include decision-making, analysis, or both.
• Other?
A Real Traffic Accident

- Based on police sketch
- Students need to make assumptions and approximations
- Information given gradually throughout problem
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Ideas:
- Add story-telling to end-of-chapter problem.
- Add motivation, require students to go beyond rote learning, do research.
- Include decision-making, analysis, or both.
- Other?
Step Three: Draft the problem

Outline the problem (create a ‘story board’) First consider, “What will be on the first page?”

Suggestions:

• Good PBL problem has multi-page, multi-stage construction – progressive disclosure.
• Not all information given in chapter or text - students look for resources.
• Challenge students to come to consensus, reach conclusions, and make judgments.
Sources and Strategies for Writing Problems

Newspaper articles, news events
Popular press in the discipline
Make up a story – based on content objectives
Adapt a case to a problem
Research papers
Other?
PBL Clearinghouse

An online database of PBL articles and problems. All material is peer-reviewed by PBL practitioners for content and pedagogy. All problems are supported by learning objectives and resources, teaching and assessment notes. Holdings are searchable by author, discipline, keywords, or full text. Fully electronic submission, review, and publication cycle. Controlled access by free user subscription, students excluded.
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