PROBLEM-BASED LEARNING IN TEACHER EDUCATION

What is Problem-Based Learning?

a pedagogical methodology by which learning is initiated with a posed problem

Students assume a role in the problem scenario and are led through a process in which they:

a) pose questions, "learning issues," identifying what they need to know in order to address the problem

b) rank the learning issues in terms of importance and decide who will investigate which issue

c) identify needed resources and where they might be found

d) gather needed information through individual and group investigation

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Students assume a role in the problem scenario and are led through a process in which they:

e) reconvene to integrate information

f) generate and evaluate possible solutions

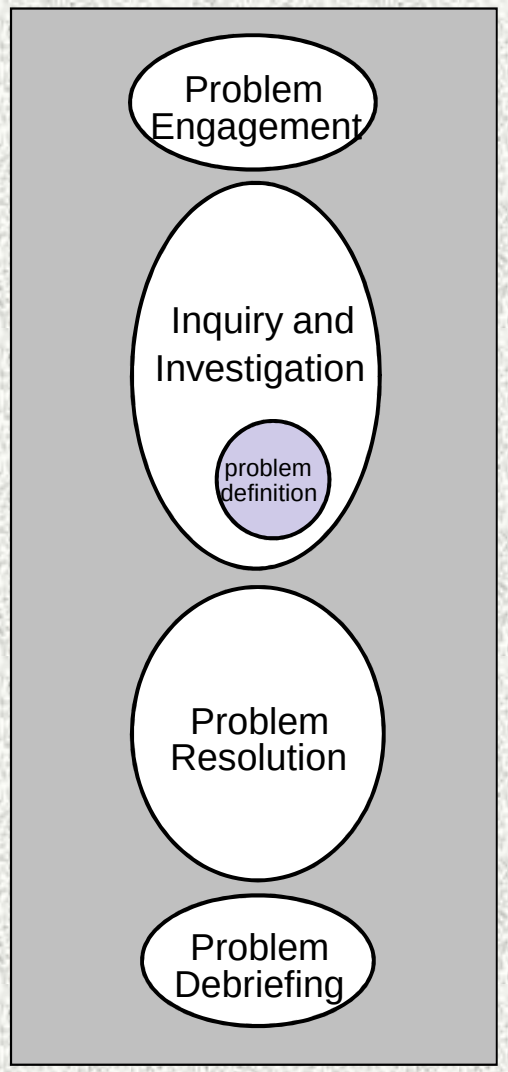
g) make needed decisions or take agreed upon actions

h) communicate results as appropriate for problem resolution

i) step out of role to debrief on problem solving experience

What is Problem-Based Learning?

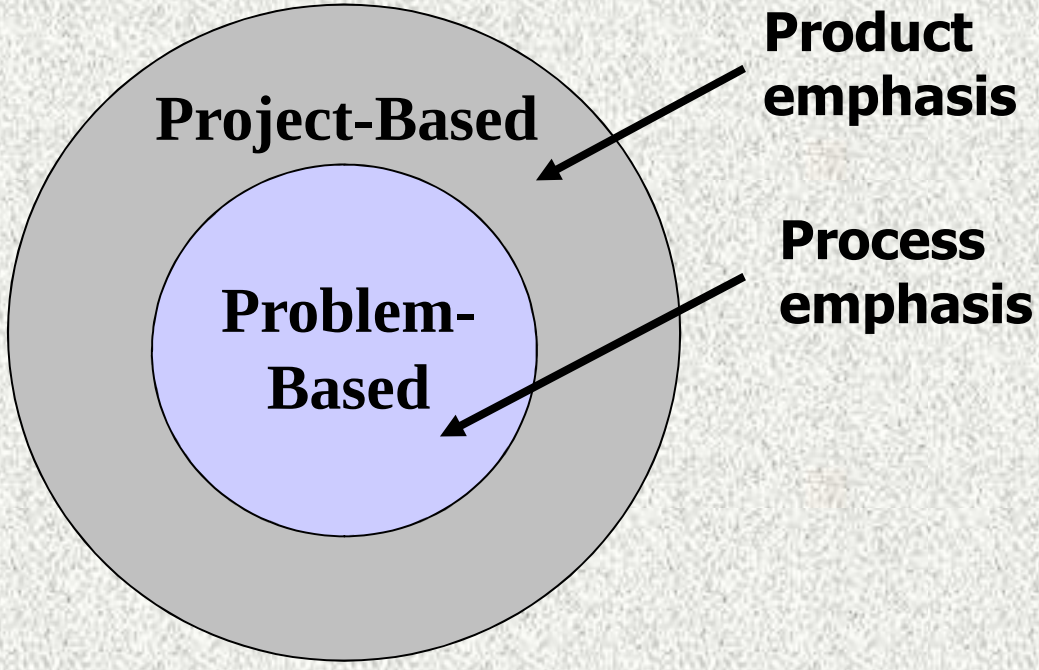
The "flow" of problem-based learning:



Stepien & Gallagher

What is Problem-Based Learning?

As distinguished from Project-Based Learning:



What is Problem-Based Learning?

Problem-Based Learning (PBL) is characterized by:

meaningful activity – PBL engages students in problems that are designed to be realistic, intriguing, and relevant to the field of study. Meaningful problems thus serve as the context and the stimulus for knowledge-building and critical thinking.

situated learning – PBL creates an environment that permits students to work on the kinds of problems that professionals encounter and to use the perspectives, the knowledge, and the skills that professionals use in attempting to solve them.

What is Problem-Based Learning?

Problem-Based Learning (PBL) is characterized by:

open-ended generative tasks – PBL engages students in an ill-structured, open-ended problem for which there is no prescribed approach or solution. Students become intentional learners as they generate their own questions, plans, and goals.

collaborative decision-making and problem-solving – PBL encourages students to work together in their problem solving and product development. Students collaborate with each other and with more knowledgeable individuals who model expert behaviors and lend assistance as students try out skills on their own.

What is Problem-Based Learning?

Problem-Based Learning (PBL) is characterized by:

changed role of the instructor -- Instructors act as metacognitive coaches throughout the PBL process. They model and coach, giving students guidance as needed, but encouraging student independence in goal setting and decision-making.

Why Use Problem-Based Learning?

It represents the way learning occurs in the world outside the classroom.

Some theorists, those who ascribe to situated cognition and activity theory in particular, claim that learning occurs *only* within the context of activity and is securely tied to the situation in which it occurs (e.g. Anderson, Reder, & Simon, 1996; Brown, Collins, & Duguid, 1989; Lave, 1988).

Why Use Problem-Based Learning?

It is engaging and, therefore, motivating.

Writing about project-based learning, a term often used interchangeably with problem-based learning, Berliner (1992) notes:

> Intertwined with the cognitive components associated with projects are the motivational components inherent in projects. These include the fact that projects teach students to be mastery-oriented, not ability-oriented; they teach students to be learning-oriented rather than performance-oriented; and they teach students to be task-involved rather than ego-involved…When there is some degree of choice for the students, project-based methods motivate students more than any other teaching method I know about. (pp. 10-11)

Why Use Problem-Based Learning?

It increases the likelihood of transfer, a primary consideration in teacher education.

The literature on transfer suggests that transferable learning experiences occur in an environment characterized by:

- Meaningful activity
- Expert guidance
- Knowledge-building collaboration

Why Use Problem-Based Learning?

It promotes desirable student outcomes:

- Intentional learning
- Relational understanding
- Critical thinking
- Creative thinking
- Effective collaboration
- Versatile communication

How Can Problem-Based Learning Be Assessed?

by using multiple means to measure acquisition of knowledge, skills, and dispositions

To Assess	Product	Method
<u>Knowledge</u> Interrelationships among facts, concepts (Relational understanding)	Concept maps Unit products Written/oral responses Traditional tests	Expert map-based scheme Rubrics SOLO taxonomy Scoring guides
<u>Skills</u> Critical thinking Creative thinking Effective collaboration Versatile communication	Unit products and/or performances Written/oral responses Observation Self-ratings Peer ratings	 Rubrics SOLO taxonomy Rubrics Self-reports Likert scales
<u>Dispositions</u> Intentional learning	Problem logs Observation	Content analysis Rubrics

How Do We Use Problem-Based Learning in Teacher Education?

to model PBL as an approach that we ask our students to use in <u>their</u> teaching

MODEL > COACH > FADE

Cognitive apprenticeship (Collins, Brown, & Newman, 1989) provides the theoretical basis of our approach to using PBL in methods classes.

First, we **model** the use of PBL by using it.

Next, we **coach** students as they develop their own PBL units to use with *their* students.

Last, with each unit students develop we lend less direct assistance, i.e., we **fade** instruction.

How Do We Feel About Using PBL in Teacher Education?

It's different!

- Student driven
- Problems prompt, rather than follow, skill development

It's hard!

- Developing a "good" problem*
- Consistent use of guided inquiry
- Giving up control

It's time-consuming!

- Planning
- Implementing

It's wonderful!

- High engagement
- Self-directed learning

* See note.

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Achmad Samsudin, M.Pd.

Jurdik Fisika FPMIPA
Universitas Pendidikan Indonesia
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