

Problem-Based Learning in Research Education

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Features of PBL

- Didactic Method:
 - Teachers are teaching pupils
- PBL
 - "Tutors" are guiding younger colleagues to find their own ways

Features of PBL

Instead of only listening to lectures
students start working with a
problem. The emphasis is on
"learning" rather than on "teaching"

Some features of PBL

- Leareners are in small groups
- Lernalers identify gaps in their knowledge about a certain problem or a given topic
- Lernalers acquire relevant information from different sources
- "Tutors" facilitate the actual learning process

Some features of PBL

- Active learning through asking questions and seeking answers
- Integrated learning by tackling problems for which knowledge from several subdisciplines are necessary
- Cumulative learning by succession of increasingly complex problems
- Learning for understanding rather than for retention of facts

A problem can be

- A statement or a description
- A picture or a figure
- A set of data
- A cartoon

In real life problems seldom present as clear and specific ones

The seven steps of PBL: Step 1

- Define terms and concepts included in the problem
- The group agrees upon the following question:
 - What does the problem deal with ?
 - What does the terms and concepts described in the problem mean ?
- Define the problem: see the problem as a broad one and as a starting point for learning the topic. Break the problem into several specific problems and write them down

The seven steps of PBL: Step 2

- Analyze the problem. "Brainstorming"
- Analyze one problem at a time
- Write down the ideas and explanations that the group already has about the problem
- You do not need to discuss now: just write them down
- Decide what more information is needed to understand the problem

The seven steps of PBL: Step 3

- Organize the ideas into categories. Identify the knowledge that is already available
- Discuss the ideas and explanations that have come forward in step 2
- **Organize the ideas into some categories**
- Leave the ideas and explanations that are irrelevant
- Critically evaluate your knowledge

The seven steps of PBL: Step 4

- Determine learning needs
- Determine what you do not understand
- Determine what more needs to be done to understand these
- Which areas and topics must be learnt?
- Determine what resources to use

The seven steps of PBL: Step 5

- Acquire the knowledge
- The group decides upon an efficient way to acquire the necessary knowledge
- What resources are available? What other resources are needed?
- **Distribute the work among the group members**
- The group then breaks up. Individual members bring information from the assigned sources.

Step 6: Analyze the newly acquired knowledge

- The group reassembles
- They present the new knowledge and assess the new knowledge critically
- They determine how the new knowledge can help understand the problem
- They come up with new questions and new ideas about how to answer those questions

Step 7: Evaluation

- Evaluate how each member of the group has contributed to understanding of the problem
- Was some one too quiet? Was some one too talkative?
- How the tutor has contributed to stimulating the learning process?

Benefits of PBL

- **Problem solving** in unfamiliar situation
 - Adapting to and participating in **change**
 - **Reasoning** critically and creatively
 - Using a "system" or "holistic" approach
 - **Collaborating** productively in teams
 - **Identifying** one's own strength and weaknesses
 - Committing oneself to **Lifelong Learning** as a means of addressing the problems
- (Engel C. Not just a method but a way of learning. 1991)

Tutor's role

Tutor functions at the metacognitive level:
Metacognitive skills: thought, reflection, deliberation etc
(Burrows HS, 1988)

Tutor's role

- Guidance
- Track the learning phase
- Probe the participant's knowledge deeply
- Involve the participants in group process
- Modulate the problem at hand
- Managing interpersonal dynamics
- Establishing learning climate
- Modelling, coaching, fading

Difficulties with PBL

- Needs more resources
- Less familiar as an educational method
- Participants may not be rightly motivated
- We are used to listen to cathedral lectures
- Needs more time