

Chapter 8

Problem-Based Approach to Instruction

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Editors' Foreword

Preconditions

Content

- Complex problems that do not have a single correct answer

Learners

- All kinds of learners
- Learners must have some prior knowledge gained from real-world experience.

Learning environments

- A room with large tables, multiple computers, and access to resources
- Instructor and organization must be committed to PBI—the entire approach

Instructional development constraints

- Sufficient time and money to develop for find the problems and learning resources

Values

about ends (learning goals)

- The development of problem solving and decision-making skills within a content domain
- The enhancement of learners' reasoning abilities and self direction
- The enhancement of transfer to real-world tasks

about priorities (criteria for successful instruction)

- Effectiveness is valued over efficiency
- Intrinsic motivation is valued over extrinsic motivation

about means (instructional methods)

- The importance of self-direction
- The use of complex, authentic problems with no single right answer
- The teacher as a tutor, process facilitator, and metacognitive coach
- The use of reflection on practice

about power (to make decisions about the previous three)

- Student should have more responsibility to direct their own learning

Universal Methods

1. Use authentic and meaningful real-world problems that fit within the curriculum for the discipline and encourage cross-discipline thinking. There are four design principles: the problems should be holistic, practice-based, ill-structured, and contemporary.
2. The tutor facilitates the development of the learner's metacognitive processing and problem-solving skills.
 - Adjust the level of guidance and support to match the needs of the learner.
 - Provide instructional materials related to the development of anticipated skills along with the preliminary content materials at the start of the problem activity.
 - Remove the tutor from the role of information provider as much as possible.
3. Use authentic assessment practices to validate the learning of content, problem-solving skills, and higher-order thinking skills (including self-direction).
 - Each student self-assesses on her or his effectiveness as a researcher and as a contributor to the problem-solving process of the group.
 - Students also reflect on process and knowledge gains and the integration of that knowledge with prior knowledge.
 - The proposed solution to the problem is assessed on criteria (often developed by the students) such as completeness, accuracy, and viability.

- Learner motivation and collaboration are assessed.
4. Use consistent and thorough debriefing activities to consolidate key concepts learned from the experience.

Situational Principles

- When students are not familiar with the PBI process, then the teacher must invest considerable effort in managing the learning process for and with the students, as well as providing answers to questions. Use instructional simulations and cases before using a PBI 'problem' (to help prepare students to become more self-regulated/independent in their thinking and able to work collaboratively).
- The choice of the problem and the level of complexity should always be adjusted to the developmental level (or maturity) of the students.
- When a class is large, the instructor should create smaller groups and allow those teams to stay together for multiple problems so they can realize the benefits of collaborative effort.
- When a class is large, the instructor should use strategies for forming and managing cooperative groups within a large class.
- A large class will need a greater quantity of resources.

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