

Teaching Through Problem-Based Learning

Tennessee Teaching and Learning Center

"How To" Pedagogies # 7



HOW TO USE PROBLEM-BASED LEARNING

Students are given a problem to think about. It is the job of the students to seek possible ways of confronting the problem, which can force them to identify the information they need to reach a solution.

Good Problem-Based Learning questions should:

- Engage student interest
- Require students to make judgments based on facts, logic, or rationalization
- Be complex enough to require all group members to contribute
- Be open-ended or controversial so as to draw students into a discussion
- Connect to the objectives of the course

Faculty need to exercise the following skills:

- Maintain "cognitively congruent" communication
- Pose simple questions to redirect groups
- Model meta-skills
- Manage the group work

NEED HELP GETTING STARTED?

The University of Delaware is a leading expert in the area of problem-based learning. UD's *Institute for Transforming Undergraduate Education* provides a variety of resources on PBL, including sample problems by subject, videos on group work, evaluation forms, and sample syllabi from courses successfully using problem-based learning in the classroom. For more information, see:

<http://www.udel.edu/inst/resources/index.html>

Additionally, UD offers a Clearinghouse of information available only to educators; if interested, you can register for an account here:

<https://primus.nss.udel.edu/Pbl/newUser.jsp>

WHAT IS PROBLEM-BASED LEARNING?

Problem-based learning (PBL) is a pedagogy that produces a "learning-centered environment" through collaboration among student groups. **PBL allows students to:**

- Think critically about real-world problems
- Locate and utilize sources of information
- Work cooperatively & improve communication skills

Although the following are excellent teaching strategies, **keep in mind that Problem Based Learning is not:**

- Group analysis of case studies
- Solving problem sets collectively
- A group project, paper, or lab

PBL is traced back to medical schools in the 1970s, in which mature, intellectual students would work together in a group with a faculty member to discuss complex problems. Today, this approach has been adopted by over 1,000 schools, to teach a variety of disciplines and levels.

There are several notable benefits of PBL:

- PBL forces students to work collaboratively in order to reach a solution
- It allows students to confront issues in a style similar to a real-life work situation
- Students will have a deeper, more complex learning experience, which is contrary to the memorization used in "plug-and-chug" learning
- PBL expands on earlier teaching approaches that essentially fail to develop the full skill set desired in college graduates of today

However, there are also issues to keep in mind when creating a problem-based learning environment:

- Conflict and disagreement among group members
- Methods of grading participation and product
- Deciding which techniques will work best for a particular class or subject area

The "How To" pedagogy series are quick reference pages that define and describe active learning methods to increase student engagement. Each handout provides basic information and references to get you started.

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MODELS OF PROBLEM-BASED LEARNING

When opting to incorporate problem-based learning into classroom teaching, there are several models that may be utilized, depending on the subject, difficulty of the problem to assess, size of the class, course level, and available resources.

Medical School Model - Students are divided into groups of 8 to 10 with one faculty leader per group to assist in the discussion. This model is recommended most for upper-level, seminar-type classes.

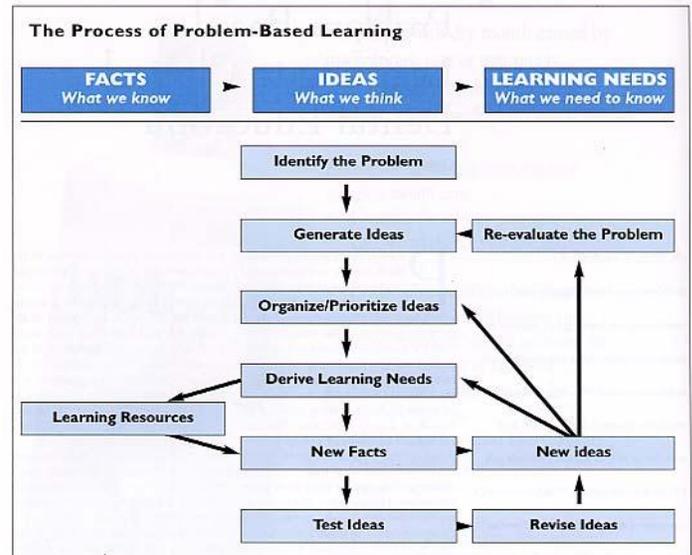
Floating Facilitator Model - In this model, it is best to limit group sizes to 4 or 5 students. The instructor acts as a floating facilitator and moves from group to group to check for student understanding.

Peer Tutor Model - This model is similar to the medical school model but, instead of a faculty or graduate student, an undergraduate peer serves as a tutor/leader in the group.

Large Class Model - PBL can work in large classes, but will be instructor-centered. In this case, the instructor will act as a discussion leader, generate questions, guide students in ranking learning issues and reporting results, and share resources.

Other models that can be applied to PBL: Think-Pair-Share, Structured Problem Solving, Team Jigsaws

VISUALIZE PROBLEM-BASED LEARNING



Shuler (2002)

REFERENCES

- Amador, J., L. Miles, and C. B. Peters. (2006). *The practice of problem-based learning: A guide to implementing pbl in the college classroom*. Bolton, MA: Anker Publishing Company.
- Duch, B.J, Groh, S.E., and Allen, D.E. (2001). *The power of problem-based learning: A practical how-to for teaching*. Sterling, VA: Stylus.
- Klenner-Moore, J. (2003). The pbl cycle. *King's College*. Retrieved from: <http://staff.kings.edu/jkmoore/PBL/cycle.htm>
- Lee, V. (Ed.). (2004). *Teaching and learning through inquiry: A guidebook for institutions and instructors*. Sterling, VA: Stylus
- Millis, B. (2010). *Cooperative learning in higher education: New pedagogies and practices for teaching in higher education*. Sterling, VA: Stylus.
- Shuler, Charles F. (2002) Application of pbl to clinical dental education. *Journal of the California Dental Association*. June.
- [Untitled Photos of Group Work] Retrieved July 29, 2011 from <http://office.microsoft.com/en-us/images/?CTT=97>



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