CIDR Teaching and Learning Bulletin

Information for People who Teach at the University of Washington Vol. 7, no. 3, 2004

Problem-Based Learning

"The basic principle supporting the concept of PBL is older than formal education itself; namely, learning is initiated by a posed problem, query, or puzzle that the learner wants to solve" (Duch, Groh, & Allen, 2001).

Here are a few examples of problems that have been used to structure teaching and learning in classes:

- Biology: Students examine the health claims of a widely advertised dietary supplement
- Art History: Students weigh competing evidence to determine whether a museum acquisition is real or forged
- Environmental Science: Students develop a preservation plan for a local forest

PBL overlaps with other active learning models such as groupwork and case studies, but is distinguished by the focus on having students delineate, research, and solve a realistic problem.

Why use problem-based learning?

- PBL better prepares students to apply their learning to real-world situations.
- PBL enables students to become producers, rather than consumers, of knowledge.
- PBL can help students develop communication, reasoning and critical thinking skills.

How does problem-based learning work?

What instructors do:

- Develop real-world, complex and open-ended problems such as might be faced in the workplace or daily life.
- Act as facilitators, making sure students are staying on track and finding the resources they need.
- Raise questions to student groups that deepen the connections they make among concepts.
- Strike a balance between providing direct guidance and encouraging self-directed learning.

What students do:

- Address the problem, identifying what they need to learn in order to develop a solution and where to look for appropriate learning resources.
- Collaborate to gather resources, share and synthesize their findings, and pose questions to guide further learning tasks for the group.

How do I get started with PBL?

Develop problems that:

- Capture students' interest by relating to real-world issues.
- Draw on students' previous learning and experience.
- Integrate content objectives with problem-solving skills.
- Require a cooperative, multi-staged method to solve.
- Necessitate that students do some independent research to gather all information relevant to the problem.

Design assessment tools that:

- Account for *process* (e.g. research, collaboration) as well as content skills.
- Are closely tied to course learning objectives.
- Balance individual and group performance.

What kinds of classes can PBL be used in?

PBL has successfully been used in disciplines ranging from engineering to art history. When adapting PBL for your course, consider the following:

- An entire course can be PBL based, or PBL can be used for part of a given unit.
- Depending on your learning goals, it is possible to design problems with a narrow range of correct solutions (such as medical diagnoses) or with a wider range of creative possibilities (such as architectural designs).
- Though usually based in groupwork, PBL can also have individualized components, provided that students are required to come together to discuss their findings.

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How can CIDR help?

At CIDR we can help you develop and implement strategies for adapting the principles of problem-based learning to your specific teaching situation. Call or e-mail to arrange an appointment.

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This issue of the *Bulletin* was developed by CIDR Staff Consultant Alka Arora.

The *Bulletin* provides people who teach at the University of Washington with *brief* descriptions of current topics related to teaching and learning in higher education. For additional resources on Problem-Based Learning, see CIDR's collection of PBL resources at http://depts.washington.edu/cidrweb/PBLTools.htm

Previous issues of the *Bulletin* include:

- Developing a Teaching Portfolio
- Classroom Assessment of Teaching and Learning
- Preparing for the First Day of Class
- Classroom Observation
- Designing a Course
- TA Preparation Reconsidered
- Teaching through Discussion
- Transforming a Course
- Helping Student Writers Succeed
- Teaching a Service Learning Course
- Teaching Freshman Interest Groups
- Information Literacy: The Library Connection
- More and Better Class Participation
- Teaching, Learning, and Technology in a UW Classroom
- Helping Students Read Well
- Mentoring
- What Helps Students Learn?
- Inclusive Teaching
- Talking with Colleagues about Teaching
- How Do We Change the Way We Teach?
- Problem Solving in Groups
- Engaging Students in Discussion Online
- Developing a Professional Portfolio
- Pieces of the Writing Puzzle
- Teaching and Learning in Sections and Labs
- Writing a Teaching Statement

Issues of the *Bulletin* are available at: **http://depts.washington.edu/cidrweb/TeachingLearningBulletin.html**

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Questions for CIDR?

If you have questions about teaching and learning, or you would like to find out more about working with CIDR, you can call us at 543-6588, send a message to info@cidr.washington.edu, or visit our web site: **http://depts.washington.edu/cidrweb/**

- Would you like to be notified by e-mail when future issues of the ***Bulletin*** are posted to the CIDR web site?
- Do you have questions about teaching that you would like to see addressed in a future ***Bulletin***?
- Has this issue of the ***Bulletin*** been helpful for you?

Please let us know by sending a message to info@cidr.washington.edu