**Designing for Problem-based Learning: Issues to consider**

Problem-based learning is one of the popular methods used in courses to promote inquiry-based experiences for students. This resource will help you if you are thinking about using PBL in your course. Specifically, after reading you will have information on:

- Curricular vs. Course Level PBL Implementation
- The design process
- How to create an instructional plan that includes PBL

**Curricular vs. Course Level PBL Implementation**
Problem-Based Learning (PBL) was first introduced as way of innovating the medical education curriculum to give students an opportunity to engage in typical problems they would encounter in their careers. At McMaster University, the PBL curriculum structure consists of a series of interdisciplinary blocks or units that have been designed to engage medical students in a broad range of health problems throughout their education. The curriculum is organized in sequential units with early exposure to patients and case management (Barrows, 1996).

While successful in medical and professional schools on the curricular level, the PBL approach has since been adapted and implemented in other disciplines at the individual course level. Rhem (1998), in an article discussing PBL at the individual course level promoted the use of PBL throughout the entire semester in order to give students the most exposure and practice in the problem-solving process. The exploration of the PBL approach in this document is intended to support your redesign of your course. Hopefully, with a better understanding of the PBL approach and the issues involved with its design, you will find this particular approach beneficial to students' learning.

**The Design Process**
The process of designing a course involves five fundamental phases: analysis, design, development, implementation, and evaluation. Each phase involves specific tasks to complete different ends. The following table shows a basic outline of the phases:

| Phases | Tasks |
|---|---|
| *Analysis* | ***Examine the contextual information about the course:***<br>• Where does the course fit within the program/curriculum?<br>• Who are the target learners? What's the class size?<br>• How long is the class period?<br>• What type of classroom is the course held in?<br>• What type of technology is available in the classroom?<br>***Identify course goals***<br>• What is the purpose of the course?<br>• What abilities does the course help students develop?<br>• What do you want to accomplish in the course in terms of student learning outcomes? |
| *Design* | ***Identify learning outcomes***<br>• What do you students to be able to do and/or know as a result of taking the course?<br>***Plan the methods and activities***<br>• What are appropriate strategies and activities to help students attain the desired outcomes?<br>***Design an Assessment Plan***<br>• How will you measure student learning?<br>• What assessment techniques will give evidence that students have attained the desired outcomes? |
| *Development* | ***Produce Materials***<br>• What materials are needed based on the design?<br>• Where and what are the resources that students might need?<br>• What are the media and tools?<br>***Produce Assessment Instruments***<br>• What are potential test items or other assessment methods?<br>• What are the criteria you are going to use to evaluate students' work? |
| *Implementation* | ***Implement the Plan***<br>• Who is involved in the implementation process?<br>• What are the potential barriers to adopting the instruction?<br>• What are the infrastructure issues and needs? |
| *Evaluation* | ***Develop a Plan to Evaluate the Impact of PBL on Student Learning***<br>• What are the evaluation methods, e.g. classroom observations, pretest-posttest, surveys, etc.?<br>***Conduct the evaluation***<br>• How successful were the changes to the course?<br>• What needs to be improved or changed? |

**How to Create an Instructional Plan That Includes PBL**

The PBL approach is different from the traditional lecture-based instruction in the following areas: instructor purpose, student engagement, learning environment, and assessment. In the traditional course, the design focuses on an *instructor-centered* plan about what to teach, how to teach and how to assess student learning. However, in a PBL course, the instructor acts as a facilitator of learning and student engagement in the problem-solving process drives the instruction and dictates the type of student support that is needed. Students in PBL environments are not lectured with a sequence of topics, but are led to learn the topics by solving problems. Savin-Baden (2000) identified a distinctive design focus of PBL whereby "…students are not expected to acquire predetermined series of 'right answers'. Instead they are expected to engage with the complex situation presented to them and decide what information they need to learn and what skills they need to gain in order to manage the situation effectively." (p.3)

In other words, the emphasis of a PBL plan is not on what to teach but how to provide an environment to engage students in learning, create the student initiative to learn, assist students in identifying learning issues, and to support the learning process. The major tasks in the instructional process for PBL consist of:

1. *Identifying/developing problems:* The analysis phase for the PBL approach is not limited to the identification of knowledge and skills that students need to learn. The critical outcome of the analysis is to identify problems that are relevant and realistic in the field of study.

2. *Organizing pedagogical structure of problem solving activities:* In a traditional PBL course, the syllabus is not structured with a series of lecture topics and exercise activities that support student application or practice of what they have already learned. Instead, the syllabus is structured with topical units of problems and students learn through solving problems. However, depending on the level of your students and the amount of background knowledge they have about the subject area you might have to prepare a series of "mini-lectures" to help them better understand key concepts and to model the problem-solving process for them.

3. Identifying knowledge resources and tools to support students' learning: The analyses of what information and skills are needed to solve the problems will help you identify resources. Some of these resources might be located on the web, in videos, or within the context of a short lecture.

The purpose of this document was to give you some introductory information on the issues involved with designing a problem-based learning course. If you would like to meet with a

consultant to discuss changing your course to problem-based learning, please send an email to the Center for Instructional Development, CID@clayton.edu .

**References**

Barrows, H. S. (1996). Problem-based learning in medicine and beyond: A brief overview.  New Directions for Teaching and Learning No. 68, pp. 3-12. Jossey-Bass Publishers Inc. UK.

Rehm, J. (1998). Problem-based learning: An introduction. The National Teaching and Learning Forum No. 8.

Savin-Baden M (2000) Problem-based learning in higher education: untold stories Open University Press. Buckingham: UK.