PBL in a Distance Learning Environment

6/25/02 presentation at Jackson (Oregon) Educational Service District

David Moursund

Teacher Education, College of Education

University of Oregon

Eugene, Oregon 97403

moursund@oregon.uoregon.edu

The Website for this workshop is http://darkwing.uoregon.edu/~moursund/PBL/. During this session, feel free to browse whatever topics seem to you to be relevant to your goals in being here this week.

Short Summary

In this 1.5-hour presentation we will be focusing on Information and Communications Technology-assisted PBL. We will use the term PBL to cover both Project-Based Learning and Problem-Based Learning by teams and by individuals.

PBL is often characterized as a "Guide on the side." approach to education, in contrast with the approach "Stand and deliver—sage on the stage." Asynchronous Distance Learning supports both the "guide" and the "sage" approaches to helping students to learn. However, because the "sage" is not present in an "in your face" mode, developers of Asynchronous Distance Learning need to pay careful attention to effective implementation of "guide" approaches to helping students learn.

In this 1.5-hour session we only have enough time for a quick overview of ICT-assisted PBL. Part of what we will discuss are the arguments to support its use in education and general methodology for doing so. The thesis is that Distance Learning can be significantly improved by appropriate use of ICT-assisted PBL. We will draw heavily from material on the Website http://darkwing.uoregon.edu/~moursund/PBL/.

Actual Topics for Discussion

This is not a "talk." Rather, it is a guided discussion of some interesting topics that relate to improving Asynchronous Distance Learning (ADL) through the use of ICT-Assisted PBL. We will not have time to thoroughly explore all of the topics listed below. But, we will have enough time to activate some of your brain cells and give you some things to think about during the remainder of the week. [Note: This presentation was part of a week-long workshop on ADL.]

The AND strategy is of the key strategies in teaching in general, and ICT-assisted PBL in particular. In my PBL lesson I can help my students learn history AND at the same time I can help them learn ICT AND at the same time I can help them learn to improve their self sufficiency and self reliance as learners AND at the same time I can learn some ICT AND etc. Good teachers are highly skilled in using the AND strategy.

1. In PBL, the goal is to produce a product, performance, and/or presentation. In ICT-assisted PBL, ICT plays a significant role in the overall process. However, an ICT-

assisted PBL lesson typically has a number of goals; increasing student's level of ICT expertise is but one of these. Use of the AND strategy is an important aspect of designing an effective PLB lesson. On the PBL Website mentioned at the beginning of this document, Part 2: Learning Goals in an ICT-assisted PBL Lesson, contains the following table.

Students will learn:	Points
1. The subject matter content of the project.	
2. IT as integral part of the subject matter content area of your specific course.	
3. Some general aspects of IT, not specific just to your course. (Examples include all of the generic IT tools.)	
4. How to budget resources (including time) in doing a project, and to self-assess one's progress in doing a project.	
5. To work as a team member with both individual and shared responsibility. Or, alternatively, to take full individual responsibility for doing a project.	
6. To be a project proposer, a problem solver, and a "creative, higher-order" thinker, working in a learner-centered environment.	
7. To transfer their learning over time, distance, and environments.	
8. To learn to help others learn all of the above.	
9. (Other, please specify.) For example, the strategy of Incremental Improvement.	
10. (Other, please specify.)	
Total Points	100

Once you decide on the major content area for a PBL lesson, a good next step is to list and analyze possible goals of the lesson, and relative emphasis to be given to the various goals. From the very beginning, you are designing a lesson using the AND strategy.

2. One of the most important ideas (strategies) in human creative endeavor is that of incremental improvement. In Process Writing, this is expressed by the statement "Revise, revise, revise." There is a close parallel between Process Writing and ICT-Assisted PBL. The strategy of incremental improvement (revise, revise, revise) should be explicitly taught in a High-Road transfer of learning mode in PBL lessons. Moreover, the same idea applies to the development of a PBL lesson. That is, you can think of the process of creating a PBL lesson as one in which you can "revise, revise, revise" as time permits. Then, after using the lesson do another round of revision to get the lesson in still better shape for the next time you want to use it and for sharing with your fellow teachers.

3.   Research and other evidence supporting PBL As we discuss these topics, we want to think about whether they are applicable to ICT-assisted PBL being done in an ADL environment.

1) "I hear and I forget. I see and I remember. I do and I understand." (Confucius)

2) Constructivism and Situated Learning.

3) Motivation Theory (intrinsic motivation).

4) Inquiry & Discovery-Based Learning.

5) Cooperative Learning.

6) Peer instruction.

7) Individual & Collaborative Problem Solving.

8) Problem-Based Learning.

9) Multiple and authentic forms of assessment. Clearly defined rubrics facilitate self-evaluation, peer evaluation, evaluation by the teacher, and evaluation by outside experts.

10) Direct research studies on PBL.

4.   Developing and implementing a done PBL-based instruction takes some careful up-front thinking and planning. In the PBL Website listed at the beginning of this document, Part 4: Planning an IT-Assisted PBL Lesson contains a 7-step process (strategy) for accomplishing this task. The outcome of this work can be represented in a table that might be somewhat similar to the one given below. Reminder: you can view the development and implementation of a PBL lesson as you (yourself) developing and carrying out a project. Thus, think in terms of incremental improvement of the product both over the time of its initial development, and over the years as you reuse the PBL lesson.

Learning Goal	Detailed Learning Objectives	Timeline and Milestones	Assessing the Learning Objectives
1. Learn the subject matter content of the project	1A 1B 1C		
2. Learn IT as integral part of subject matter content	2A 2B		
3. Learn some general aspects of IT, not specific to your course	3A 3B		
4. Learn to budget resources and to self assess	4A 4B		

5. Learn to work as a team member			
6. Learn to be a project proposer, a problem solver, and a "higher-order" thinker	6A 6B 6C		
7. To transfer their learning over time, distance, and environments.			
8. Learn to learn and help others learn all of the above	8A 8B		
9. Other (please specify)			

5. Multimedia. It can take a lot of instructional and student effort for students to learn to produce adequate quality multimedia products. Use care to avoid this aspect of a project overwhelming the other goals. There is a large amount of accumulated human knowledge on desktop publication and desktop presentation. Students can learn some of this by self-guided discovery, trail and error, and from each other. However, specific instructional materials backed up by a knowledgeable teacher are very important in this realm.

6. Timelines and Milestones. In this area, your long-term goal is to have students develop the knowledge and skills to define their own Timeline and Milestones. You want them to learn to appropriately budget their time and other resources when faced by individual and team projects they will encounter as they continue their education, secure a job, run a household, and so on.

7. Assessment. Authentic assessment goes hand in hand with authentic curriculum content and authentic instructional processes. Generally speaking, a PBL lesson has a focus on higher-order knowledge and skills. It is rooted in Constructivism. Even when two students select (or, are assigned) the same topic, they will produce substantially different products, presentations, and performances. Thus, traditional objective and short answer tests tend to make no sense in a PBL learning environment.

    A. It is common in PBL assessment to make use of rubrics. Students can help to develop the rubrics that will be used in assessment of their work. Teachers who engage students in helping to develop the rubrics find that this tends to increase student motivation. In addition, the discussion is a good way to help students understand the rubrics that will be used in assessment of the lesson.

    B. Students can learn to self-assess. Indeed, you may well set this as one of the goals in your PBL lessons. An independent, self-sufficient learner has the knowledge and skills to self-assess. So, if you want to help students to become independent, self-sufficient learners, help them learn to self assess their work.

8. Special considerations for the use of IT-assisted PBL in an Asynchronous Distance Learning environment.

A. In some sense, the use of individual IT-assisted PBL assignments is a "natural" in Asynchronous Distance Learning. (If you want to stretch the point, an entire Asynchronous Distance Learning course can be viewed as an IT-assisted PBL lesson. Keep this idea in mind as you develop and use such courses.)

B. Team-based PBL in Asynchronous Distance Learning requires creating situations in which two ore more people who are not located in the same place can coordinate their PBL activities. This is a highly desirable thing to accomplish…it can be viewed as an AND. It is not easy to learn to work cooperatively with one or more people who you don't even meet with face to face.

C. And, of course, there is the issue of cheating. (If there were simple answers to this, someone would have discovered or developed them and lots of people would know about them.)

9. Final questions.

A. ADL via the Internet is a relatively new field of human endeavor. Thus, it is relatively easy to ask questions that have no easy answer—indeed, questions for which adequate research is lacking. This suggests that a teacher who is developing and using ADL needs to carry on Action Research. Teacher-as-researcher is an important strategy for improving both one's own teaching and to contributing to improving our educational system.

B. Some of the benefits of PBL come from having students working in teams and learning from each other. If ADL is designed so that each student works completely alone and does not interact with any other students, some of these benefits (learning goals) are lost. Because of this, often ADL is designed in a manner that facilitates student interaction. For example, a "cohort" of students might start a course all at the same time. There may be milestones that must be completed by certain specified dates. With this added structure in an ADL course, one can then have group discussions (using chat facilities) and teams working on projects.