

Using Problem-based Learning in Higher Education

Using Problem-based Learning in Higher Education: Learning from Research and Experience



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Presentation Objectives

1. To review the concept of problem-based learning and its role in higher education;
2. To know the role of teachers and students in a PBL environment;
3. To understand components of a PBL project;
4. To understand the strengths and limitations of PBL as a learning method.
5. To understand curriculum options in implementing problem-based learning in higher ed.

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PBL Implementation at CMMU

- Represents almost 20% of our curriculum
- Implemented over the past 6 years with over 300 students per year
- Over 35 instructors have been involved in our implementation
- We have developed 9 PBL “projects” on a variety of management problems
- All modules incorporate learning technology through either video representation of “the problem” or through simulation of the problem and solution

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Teaching does not equal learning

- Teachers should not just “cover” subjects
- Teacher-directed instruction can be learner-centered
- Our goal should be *active learning*
- PBL is one way to achieve that.



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Goals of Professional Education

“Education in the professions should prepare students for action.”

Charles Gragg, 1940
Harvard Business School



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Problem-based Learning: A Definition

“PBL is the learning that results from the process of working towards the understanding or resolution of a problem. *The problem is encountered first in the learning process*, rather than facts or information, and serves as a stimulus and focus for problem-solving and learning.”

Barrows and Tamblyn,
Problem-based Learning, 1980

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How Does PBL Differ From Case Teaching?

1. PBL starts with the problem rather than with theoretical content
2. Initial learning of concepts takes place in relation to solving the problem
3. PBL emphasizes both analysis and action or implementation of solutions
4. PBL always takes place in learning groups
5. PBL addresses the *emotions* of the workplace as well as cognitive skills

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Problem-based Learning is not

- Problem-solving designed as an exercise for applying information previously learned in a subject-centered approach;
- Problem-solving intended to demonstrate the relevance of prior learning;
- Finding the answer to a question.

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Competencies Obtainable Through PBL

- Adapting to and participating in change
- Making reasoned decisions in unfamiliar situations
- Reasoning critically and creatively
- Adopting a more universal or holistic outlook
- Practicing empathy, appreciating other viewpoints
- Collaborating productively in groups or teams
- Identifying own strengths and weaknesses and undertaking appropriate remediation

From Charles Engel, 1991

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Active Learning Through PBL



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Use of Local Problems Overcomes the "Walmart Syndrome"



- Gives richer clues about the real context
- Provides a setting learners can understand more easily
- Motivates students
- Reduces gap between context of school and the workplace

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Faculty Perspectives on PBL



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Research on the Outcomes of PBL

1. Results on most cognitive outcomes are comparable or better to those from traditional curriculum depending on the type of knowledge tested
2. Students enjoy the PBL curriculum more; they demonstrate higher motivation and more productive attitudes towards their learning.
3. Students complete their programs at a higher percentage and in less time.
4. PBL curricula cover less content but in more depth.

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Summary of Key Issues in PBL

- Content coverage vs. depth
- Motivation vs. control
- Develop lifelong learners
- Students as knowledge workers
- Mix of lecture and PBL

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Sample PBL Project



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Sample PBL Project in Entrepreneurship: Retail to E-tail

- A common problem that affects many SMEs in Thailand
- Internet use for sales & marketing
- Locate the problem in several local industries – manufacturing, education, service



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Retail to E-tail: Module Overview

- **You are Marketing Consultants specializing in E-Commerce solutions.**
- **A client is an SME struggling with** how to utilize the internet to increase sales, reduce costs and increase profitability.
- **You are asked to analyze its problem and produce an E-Marketing Strategy** including a prototype website for the client.
- **This is not a case study!**

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The Problem: Muay Thai Boxing

- Promoter wishes to:
 - reach a broader audience
 - Create a wider audience
 - Increase sales channels for variety of products
- Does not know how he can use the internet to achieve these goals

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Retail to E-tail: Learning Objectives

1. Devise a situational analysis **for a specific business**
2. Formulate an E-Marketing strategy **based on the strengths and weakness of a specific business**
3. Implement an E-Marketing strategy **based on segmentation, product customization, and personalization for a specific industry**
4. **Demonstrate** understanding of how **E-Marketing/E-Commerce can benefit a business**

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Module Process

- Class of 24 students (max)
- Module lasts 6 weeks including assessment
- Students form teams of 4-6 students in 1st week
- Meet weekly in/out of class to “solve the problem”
- Combination of mini-lectures, team meetings, outside research, technical lab
- Responsible for deliverables

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Retail to E-tail: Deliverables

- **Progress Report (Due Week 3) group**
- **Quiz (Week 5) individual**
- **Reflective Essay (Due Week 6) individual**
- **E-Marketing Plan (Due Week 6) group**
- **Prototype Website (Due Week 6) group**
- **Presentation (Week 6) group**

** Three-hour session for Dreamweaver Tutorial

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Retail to E-tail: Assessment

- **E-Marketing Plan** **40% Group**
- **Prototype Website** **15% Group**
- **Presentation** **10% Individual**
- **Reflective Essay** **10% Individual**
- **Knowledge Exam** **25% Individual**

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Examples of Products: Retail to e-Tail Web Site



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Students Responses

- Learn to think analytically and systematically
- Learn to work as a team, blend knowledge, delegate work, use our resources
- Learn knowledge, skills that are relevant
- Have to transform theory into practical application
- Can use what we learn at work

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Summary and Conclusions

PBL Goes Beyond Cases in Solution and Product Design and Expression

Products

- Memo
- Interview Role Play
- Simulation
- Website
- Presentation
- Plan or Strategy

Benefits of Solution Orientation

- Consider use of knowledge (tool)
- Forces students to consider practice not only analysis
- Fosters transfer

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Limitations of PBL

1. Cannot cover as much content.
2. Demands new skills from teachers and students
3. Effectiveness depends on student motivation to read and search for resources
4. Requires effective and time-consuming feedback
5. Assessing individuals vs. groups
6. Can be exhausting for students

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Limitations of PBL Implementation in Practice

- Requires greater skill in instructor assessment
Requires much higher instructor interdependency
- Heavy time commitment on assessment
- High variance in quality/skill among instructors within a project team



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What We Have Learned

- Local factors are critical in pace of implementation
- Keep class size under 30
- Develop instructor skills, especially in assessment
- Smaller instructor teams are better (< 4)
- Use continuous formative assessment of the projects
- Asian students can adjust



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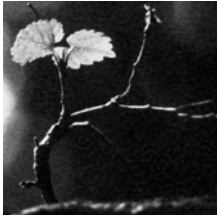
Recommendations for Implementing PBL

- PBL can be a productive force for improvement of teaching and learning.
- Don't view PBL as the only way, but as one useful approach to learning – many useful approaches to create active learning
- PBL will not be suitable for all instructors and students.
- Assess your strengths and limitations in advance to set the pace of implementation.
- Assess frequently and be prepared to adjust.

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“Seeing and hearing is believing, but eating is knowing”



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