Module 7: Introduction to Project Oriented Problem-Based Learning

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Learning Objectives

At the end of this module, participants should be able to;

1. Describe clearly what is POPBL and its characteristics.
2. Understand the overall idea of POPBL from the case study.
What is POPBL

A systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed tasks over a period of time, resulting in a product, presentation or performance. Typically has timeline and milestone, and other aspects of formative evaluation as the project proceeds.
Why PoPBL

Projects are important component of constructive approaches

Develop competences in project management, verbal & written communication skills

Peer learning, in which students share their skills to achieve a common goal

Provides a social environment
Characteristic of POPBL

Student centered learning

• In collaborative and interdisciplinary environment that motivates high level thinking

Skills and abilities development

• Problem solving
• Communication
• Cooperation
• Negotiation
• Decision making
• Life-long learning
Knowledge of literature

Necessary knowledge to solve problems

Understanding common knowledge

Ability to develop new knowledge

Lecture based
Difficulties

With regards to operational levels in organization since traditional focus on science and conventional technical issues

How to find time for project work itself.

Academic directors, planners and teachers have been brought with traditional paradigm (lecture-based)
Principles

• Project oriented problem-based learning
  – POPBL emphasizes learning activities that are long-term, interdisciplinary, and student-centered.
  – Connect classroom learning to its application in the outside world addressing problems that people usually face, not focused in grade.
  – Learning experiences are designed as complex, authentic (real-world) projects which emerge from needs in the community or arise from social issues, physical, emotional, or recreational needs and can also be linked with industry or business activities.
Advantages of POPBL

• In comparison with traditional classroom methods, POPBL results in better:
  – Content knowledge
  – Conceptual knowledge
  – Problem solving ability
  – Metacognitive skills
  – Attitude toward learning
PBL & POPBL - Similarities

• Engages students in complex, real-world problem solving that is academically rigorous, relevant to students and the community, empowers students as active learners, encouragement of student initiative, self directive, inventiveness, and independence.

• Problem is presented to the students first at the start of the learning process, before other curriculum.

• The curriculum consists of carefully selected and designed problems that demand from the learner acquisition of critical knowledge, problem solving proficiency, self-directed learning strategies, and team participation skills.

• Both are instructional strategies intended to engage students in authentic, “real world” tasks and constructivist approaches to enhance learning.

• Open-ended projects or problems with more than one approach or answer, to simulate professional situations.

• Student-centered, and the teacher in the role of facilitator or coach.

• Students engaged in project- or problem-based learning generally work in cooperative groups for extended periods of time, and are encouraged to seek out multiple sources of information.

• Often these approaches include an emphasis on authentic, performance-based assessment
PBL & POPBL - Major difference

• In problem-based learning the inquiry, applying and integrating knowledge (rather than the end product) is the primary focus of the learning process. End products are simpler and more summative, such as a group’s report on their research findings.

• Project oriented problem-based learning tends to be associated with engineering and science instruction. The focused end product drives the planning, production, and evaluation process.
## Other Differences

<table>
<thead>
<tr>
<th>Problem-based Learning</th>
<th>Project oriented problem-based learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small group work happens in presence of a tutor</td>
<td>Small group work happens most of the time without the presence of a tutor</td>
</tr>
<tr>
<td>Tasks are realistic, but rather small</td>
<td>Tasks are realistic, professional and rather big</td>
</tr>
<tr>
<td>Tasks cover most of the subject matter of the curriculum</td>
<td>Tasks only cover a small part of the subject matter of the curriculum</td>
</tr>
<tr>
<td>There are few lectures</td>
<td>Lectures are important</td>
</tr>
<tr>
<td>The result of a task is mainly knowledge</td>
<td>Group work is product oriented; results are also knowledge and skills</td>
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<tr>
<td>No task division is used but individual differentiation is used at the work for the same learning goals, to get better group discussions</td>
<td>Task division is used to get better products</td>
</tr>
<tr>
<td>Skills training is partly interrelated with other education</td>
<td>Skills training is strongly interrelated with other education</td>
</tr>
<tr>
<td>Student centered</td>
<td>Student centered in the project work, less in the course work</td>
</tr>
<tr>
<td>Overall self responsibility</td>
<td>Self responsibility in project work</td>
</tr>
<tr>
<td>Individual block tests and individual progress tests.</td>
<td>Assessment of group products and individual preliminary examinations</td>
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</tbody>
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Case Scenario

You’re Fired!
Apprentice, an American TV series in order to understand some important learning processes involved in POPBL
Thank you
(End of Module 7)
Module 8: Designing the Project and Planning for implementation of POPBL
Learning Objectives

At the end of this module, participants should be able to:

1. Understand the phases in implementation of POPBL.
2. Understand the role of facilitators and students.
Common Features of POPBL

- Project work is normally **supported** in the beginning of the course with **traditional teaching**
- After introduction students study new subject **independently**
- A few projects are handled with gradually **increasing complexity**
- Students work in **teams** (cooperate with other team members during group discussions, brainstorming, etc.)
- Students develop **practical skills** (information gathering, design, CAD, and presentation competencies)
- Generic graduate attributes such as communication, teamwork, project management are promoted.
Designing the Project

Planning circle
- Pre-planning experience prior to the total POPBL implementation planning phase

Boosting the students
- Cooperation skills and project management
- Ability to work in teams and manage teamwork
- Ability to organize complex work and solve problems

Possible outcome
- Elaborate on the outcomes of the brainstorming activity and combine these results with the institution’s overall vision
In particular projects should:

- Be challenging but with good chances for successful completion
- Be common enough so that there is literature available
- Emphasize the application of theory
- Involve engineering design work
- Meet specified standards and safety criteria
- Not involve proprietary information if industry is involved.
Formulation of problem in POPBL

• Good POPBL Problems.
  – relate to real world, motivate students
  – require decision-making or judgments
  – are multi-pages, multi-stages
  – are designed for group-solving
  – pose open-ended initial questions that encourage discussions
  – incorporate course content objectives,
  – higher order thinking and other skills
Examples of Designing

1. **Design the classroom**
   - When students arrived on the first day of school they found an empty classroom. We asked students to undertake the designing their own learning space, one that would support experience-based, collaborative learning.

2. **Iron chef cook-off**
   - To understand the reasons behind colonization, we explored the spice trade with his class. Students participated in an “Iron Chef” competition where they each picked a spice important during the Imperial era in Europe, learned its history and then had a cooking competition featuring both the history of the spice and a dish.

3. **Label-reading literacy**
   - Students learned how to read the labels on the back of granola bars. They discussed portions and the nature of chemicals added to food products. They then created their own granola bar and designed its wrapper and label.
You are working in an engineering company with a major research department and your company needs to employ more engineers. You receive a call from the Human Resource Manager to give him inspiration for an advertisement in the newspaper. He is under a deadline and he is only able to give you five minutes to come up with key words specifying competences for the new colleagues of yours. Therefore, he asks you to find key words and send them to him in five minutes.
Project timeline
Thank you
(End of Module 8)
Module 9:
Developing student learning activities and assessment
Learning Objectives

At the end of this module, participants should be able to;

1. Know the activities done in implementation of POPBL.
2. Understand the method of assessing the students.
Case study

- A study in American schools
The way for assessing in POPBL

Two way

Formative assessment
- Outcome that used for feedback to both students and teachers to realize how learning is progressing

Crit Assessment
- Important to understand students’ opinions of the primary method used to assess
Capability

• Courage
• Risk taking
• Intuition
• Sharing
• Acceptance of personal responsibility
• Flexibility
• Initiative
• Self confidence

Performance

• Product
• Presentation
Thank you
(End of Module 9)
Module 10
Business Simulation: POPBL using online
• Anderson and Lawton conducted a series of studies on the use of **business simulations** as the “problem” for problem based learning.

• As this simulation involves end product which is mainly the sales, it can be considered as POPBL
• Desired Outcomes (1) Business Simulation

- Terminology
- Integration of functions
- Demonstrate the difficulty
- Enhance retention of knowledge
- Transfer learning to business world

Learning

- Marketing
- Finance
- Operations
- Strategy
- Teaming
- Oral Presentation Skills
• Desired Outcomes (2)
  Business Simulation

- Improve student attitude
- Provide common experience
- Engage students
- Attitudinal
Business Simulation

Desired Outcomes (3)

- Teach students to apply concepts
- Enable student to implement concept
- Improve student business decision skills
- Improve students interactions
- Student to practice business decision
- Improve student business decision skills
• A computer model attempts to reflect the basic dimensions of a business environment and the students vie either against each other or against a set of computer competitors to achieve success in the simulated marketplace.
Business Environment
Simulates the workings of a small manufacturing business
Mogul Business Simulation
Thank you

THANK YOU