An example of PBL case in Medicine

**family physician practice**

Woman, 22 years old, not married, lives with her parents, she is a nursing aide in an old peoples home, youngest of 5 children. The G.P. sees her every now and then with complaints of hyperhidrosis*. Complaint now: since three days sick and vomitting, everything comes back. Stools normal, no abdominal pains. She is not feeling very ill, on the other hand she is not feeling able to work. When asked whether there has been anything special recently, the patient relates that for three weeks she has been in charge of a nursing department of the old peoples home, because the person normally in charge went on holidays. “The old people looked down at me as a youngster, they did not accept any instruction from me”. The complaints started directly after this period, when the head of the department had returned from her holiday (three days ago). You don’t notice any abnormality in her physical appearance.

* Hyperhidrosis: excessive sweating

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**PBL Aalborg Practice**

Three main characteristics
- Problem
- Project
- Team work

Examples mainly from Engineering

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**PBL Aalborg Model Principles of**

Project-organized problem-solving Learning

- Literature
- Lecture
- Group studies
- Problem analysis
- Problem Solving
- Report documentation
- Tutorials
- Field studies
- Experiments

“The Aalborg Experiment – project innovation in university education” - Kjaersdam & Enemark (1994)
Development of different Competences through the study

<table>
<thead>
<tr>
<th>Method</th>
<th>Collaboration method/ Method of project work/learning</th>
<th>Discipline learning</th>
<th>Methods used in industry and institutions</th>
<th>Scientific method</th>
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<td>Semester</td>
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Team work

What ?
- A group of students working together on a project
- They have to both carry out the project and document the results
- Based on the documentation an oral individual examination is held. Before the examination the group presents the project

Why ?
- A survey in 1997 showed that 75% of the companies wanted new employees to have good skills in team work
- Most engineers work in teams
- The individual student in the group learns from the others (peer learning)
- Responsibility towards the group leads to very hard work
- Group members provide social support, thus lower drop-out rate

How ?
- Each group has a group room
- Group size of 6-8 students first year, 2-3 students last year
- Students are in charge of forming groups
- New groups formed every semester
- Team building courses:
  - Roles, communication, co-operation, conflicts

Projects

What ?
- A unique task
- Have a lot of complex activities
- Needs several people with different skills
- Have a final goal/objective
- Limited resources (time, money, people)
- Have to deliver a result at a given time:
  - As a minimum a written report
**Projects**

**Why?**
- More and more companies use project organization
- Much engineering work is performed as projects
- Motivates the students and increases student activity
- Secures deep learning in subjects covered in the project
- Improves documentation skills

**How?**
- One project each semester
- Necessary theories and methods given in (project) courses

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**The New Aalborg Model**

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<th>Course 5 ECTS</th>
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<td>Project 15 ECTS</td>
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In groups up to 8 persons
Self-selected groups
Appointed supervisor(s)

**How?**
- One project each semester
- Necessary theories and methods given in project courses
- Each group has (at least) one supervisor
- Documentation:
  - a written report, oral defence, (construction)
- Courses in:
  - project management and planning

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**Problem based project work - a model**

- Initial problem of the project – what makes you wonder?
- Analysis of the initial problem – central themes and elements of the question(s) which will be the problem, addressed in the project.
- Project design

**Problem statement**
- Methods
- Theories
- Empirical work
- Finding a solution?
- Creating new knowledge

**Conclusion**
- Answering the question of the problem statement.
- Placing the question into other perspectives

**Process oriented project work - a model**

- Establishing the group as a team
- Clarifying strengths and weaknesses of the group members, group visions, and expectations
- What increases and decreases motivation for the work and the team?

**Defining individual and collective learning objectives**

- Establishing structures for knowledge sharing and process evaluation
- First evaluation of work process – do we reach our objective? Do we work towards collective goals? Do we share knowledge, and experiences? What can we learn and improve? Do we need to change strategies or structures?

- Reflections on the project and team process
- Did we reach our objectives?
- What do we wish to do different in our next project?
Problem based project work

PROBLEM

What?
- It can be theoretical, practical, social, technical, symbolic-cultural or scientific
- It grows out of students’ wondering within different disciplines and professional environments
- It is the starting point directing the students’ learning process and situates the learning in a context
- It may involve an interdisciplinary approach in both the analysis and solving phase
- It has to be exemplary

EXEMPLARITY

- Selection of relevant specific learning outcomes and content/scientific knowledge that is exemplary to overall learning outcomes
- That is, the problem needs to refer back to a particular practical, scientific and/or technical domain
- The problem should stand as one specific example of more general learning outcomes related to knowledge and/or modes of inquiry

AAU students on problems

- “We are engineers – our responsibility is to solve real technological problems.”
- “This is the first time we found a real problem ourselves rather than getting something from supervisors. It is really exciting. It fits my way of learning. I learn better when I find the way myself. This way of learning is much better than only attending lectures, because I have to know why I need to learn this. When I know the objective clearly, I learn much better.”
- “When working on a problem, I am strongly motivated and attracted. We need to solve this problem.”

Xiangyun Du, 2005

Problems

Why?
- Real world problems are interdisciplinary and complex
- It is a learner-centred process
- It meets the learners’ interests and enhances motivation
- It emphasizes development of analytical, methodological and transferable skills

How?
- The project groups choose their own problem to work with in the projects
- The problem has to be analyzed within a relevant context before it can be solved or analyzed further
- The problem determines the choice of methods and theories to be used
We develop social skills in group work, this improves the learning process.

We develop ourselves and get mature along the way.

We feel easier to learn the technical skills through group work.

Project work help me get more sense of what I am going to learn.

I am confident in different tasks now.

We learn best when the knowledge can be related to the experiment and our own experiences.

We get mental support from each other, it involves lots of responsibility so that we don’t easily drop out (Female A&D).

I understand things better through explaining, discussing and practicing different tasks now.

This makes our study serious… like real work place (Male EE).

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Questions left?