

Problems = Solutions?!

Problem Based Learning (PBL) as Alternative Approach to Teaching and Learning in Higher Education

Presentation outline

- What is PBL?
- Short History of PBL in Europe
- The Maastricht Seven Steps Model
- The Research Project on PBL at TUD

What is PBL?

In problem based learning, students collaborate to study the issues of a problem as they strive to create viable solutions. Unlike traditional instruction, which is often conducted in lecture format, teaching in problem based learning normally occurs within small discussion groups of students facilitated by a faculty tutor (Aspy, Aspy, & Quimby, 1993)

PBL in Europe

- **1960s:** Founded at McMaster University, Canada, in the field of medical education
- **1970s:** PBL at Maastricht University, The Netherlands
- **Since 1980s:** Spread across Europe, application in various disciplines
- **1990s:** Systematic Evaluation of research on the effects of PBL
- **2000s:** New relevance due to Bologna Process (student's employability)

Core Dimensions of PBL

- **Authentic problems** as center of the learning process
- Learning takes place in **small groups**
- **Self-organization** of the group
- **Stepwise Procedure**
- Guidance through **Tutors**

The Maastricht Seven Steps

1. Clarification of terminology

2. Defining the problem

3. Analysing the problem, collection of
ideas

4. Structuring / systematic
inventory of ideas

5. Formulation of *learning
goals*

6. Individual or collective
research and studies

7. Synopsis and
solution



Empirical Evidence

- Positive effects on ‚soft‘ dimensions, such as **self-assessed competencies** and **teacher ratings of students‘ performances** (Jones et al., 2002)
- No effect or negative effect on the **acquisition of knowledge**, measured in ‚conventional‘ (summative, declarative) testings (Mamede et al., 2006), but high performance in practical tests and problem solving (Colliander, 2002)
- And: high acquisition of key competencies such as **interdisciplinary skills, communication and collaboration skills** and **management skills** (see Kolmos et al. 2008)

Research Project PBL at TUD

- **Project Title:** Efficacy of problem-based learning and professional development of university teachers in three countries: Germany, Sweden and the Netherlands
- Funded by the **German Ministry of Education and Sciences**
- www.hdz.tu-dortmund.de/pbl

Research Objectives

- **Description of problem-based learning scenarios and practices across different European countries**
- **Exploration of the outcomes of PBL as a teaching method in higher education in a cross-national design**
- **Exploration of teachers' attitudes toward teaching in PBL and of the effects on the outcomes of problem based vs. 'conventional' teaching**

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The screenshot displays the website for the PBL project at TU Dortmund. At the top left is the TU Dortmund logo. The top right features the HDZ (Hochschuldidaktisches Zentrum) logo and a small image of a building. Below the header is a navigation bar with links: STARTSEITE, NEWSLETTER, KONTAKT, SUCHE, IMPRESSUM, INTERNET. A breadcrumb trail reads: Sie sind hier » Startseite » Forschung / Projekte » Laufende Projekte » PBL » Startseite. A 'Menu:' section on the left lists 'Startseite', 'Das Projektteam stellt sich vor', 'Forschungsdesign', and 'Some information in English'. The main content area is titled 'WILLKOMMEN AUF DEN SEITEN DES PROJEKTS "PBL"' and includes a photo of the 'Projektteam Juni 2009'. Below the photo is a caption: 'von links nach rechts: H. Vulk-Orand, A. Scholkmann, J. Rückeb, B. Roters, F. Eder nicht im Bild: Frau Prof. Dr. S. Metz-Göckel'. The 'PROJEKTTITEL' section describes the project as 'PBL – WIRKSAMKEIT PROBLEMBASIERTEN LERNENS ALS HOCHSCHULDIDAKTISCHE METHODE' and mentions its focus on professionalizing young researchers. At the bottom, a diagram shows 'Lösungsvorschlag' leading to 'Problemstellung'. The right sidebar contains 'NEWS' (September 2009, April 2009, März 2009) and 'TERMINE' (14.10.2009, 27.-30.08.2009, 02.09.2009, 01.07.2009).