Problem Based Learning (PBL)

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ITU Standards Education Webinar

April 30, 2012

Problem Based Learning

History

- Aalborg University (AAU) - established 1974
- Faculty of Engineering and Science combined 2 existing engineering institutions
- The study form:

problem oriented and

project organized group work

- In the beginning - much skepticism, outside and within the university

Mona Dahms, "Establishing a Global PBL Community – the UNESCO Chair in Problem-Based Learning", Feb. 2008

Problem Based Learning

Structure

- The PBL approach applied at Aalborg University is both project-organized and problem- based
- Prerequisite for the using of project work as the basic educational methodology:
- The curriculum is organized into general subjects or "themes" normally covering a semester
  - The themes chosen in a programme must be generalized in such a way, that the themes in total will constitute the general aim or professional profile of the curriculum
  - The themes must provide for studying the core elements of the subjects included (through the lecture courses given) as well as exploring (through the project work) the application of the subjects in professional practice

Stig Enemark, Anette Kolmos and Egon Moesby, "Promoting and Supporting PBL Interests World Wide", 2006

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Project-Organized

- *Project-organized* means that traditional taught courses and labs are replaced by project work assisted by lecture courses
- The project-organized concept moves the perspective from description and analyzing into synthesizing and assessment
- The concept is based on a dialectic interaction between the subjects taught in the lecture courses and the problems dealt with in the project work

Stig Enemark, Anette Kolmos and Egon Moesby, "Promoting and Supporting PBL Interests World Wide", 2006

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Project-Organized

- Each term has a basic structure containing, in principle, equal distribution of lecture courses and project work
- The study-time is dominated by lecture courses at the beginning of the term and by project work at the end
- The project work is carried out by groups of four to six students having a teacher appointed as their supervisor

Stig Enemark, Anette Kolmos and Egon Moesby, "Promoting and Supporting PBL Interests World Wide", 2006

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Problem-Based

- *Problem-based* means that traditional textbook-knowledge is replaced by the knowledge necessary to solve theoretical problems
- The problem-based concept moves the perspective from understanding of common knowledge into ability to develop new knowledge
- The aim of the project work is "learning by doing" or "action learning"

Stig Enemark, Anette Kolmos and Egon Moesby, "Promoting and Supporting PBL Interests World Wide", 2006

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Problem-Based

- The project work may be organized by using a "know-how" approach for training professional functions, or it may be organized by using a "know-why" approach for training methodological skills of problem-analysis and application
  - The former is normally applied in first half of the curriculum where the necessary disciplines are taught in the lecture courses
  - The latter is applied in the second half of the curriculum and is supported by lecture courses presenting the necessary theories within the specific professional areas.

Stig Enemark, Anette Kolmos and Egon Moesby, "Promoting and Supporting PBL Interests World Wide", 2006

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Learning to Learn

- The main challenge of the future will be to accept that the only constant is change
- To deal with this constant change the educational base must be flexible
- Graduates must possess skills to adapt to a rapidly changing labor market and they must possess skills to deal even with the unknown problems of the future
- Professional and technical skills can be acquired and updated at a later stage in one's career while skills for theoretical problem-solving and skills for "learning to learn" can only be achieved through academic training at the universities

Stig Enemark, Anette Kolmos and Egon Moesby, "Promoting and Supporting PBL Interests World Wide", 2006

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Learning to Learn

- A consequence of this shift from teaching to learning is that *the task of the teacher is altered from the transferring of knowledge into facilitating learning*
- Project work also fulfills an important pedagogical objective.
  - Student must be able to explain the results of their studies and investigations to other students in the group
- This skill appears to be vital to professional and theoretical cognition: *Knowledge is only established for real when one is able to explain this knowledge to other*
- In traditional education the students restore knowledge presented by the teacher
  - When the project organized model is used, the knowledge is established through investigations and through discussion between the student members of the project group, and mainly without the presence of the teacher

Stig Enemark, Anette Kolmos and Egon Moesby, "Promoting and Supporting PBL Interests World Wide", 2006

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Impact

- Gradual process of acceptance - internally of the study form and externally of the candidates
- Today AAU candidates are considered to be more easily employable than candidates from the Technical University of Denmark
- PBL is one of the main elements in the strategic plan of action for the university

Mona Dahms, "Establishing a Global PBL Community – the UNESCO Chair in Problem-Based Learning", Feb. 2008

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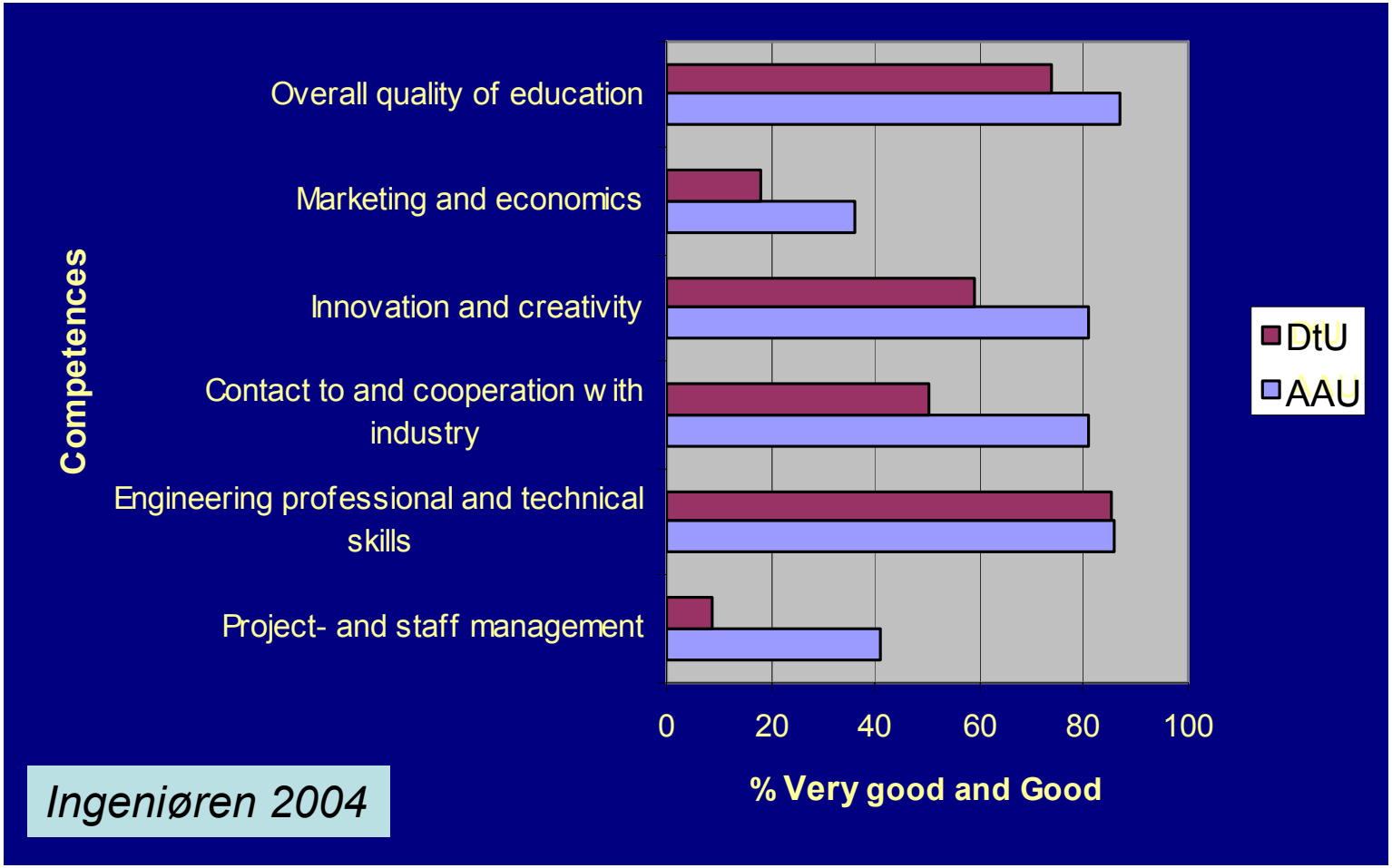
Impact



Mona Dahms, "Establishing a Global PBL Community – the UNESCO Chair in Problem-Based Learning", Feb. 2008

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Impact

- 57% of private employers prefer candidates from AAU over candidates from [.. a more conventional university]
- Reasons:
  - good skills in team work
  - innovation skills
  - project management skills
  - ability to acquire new knowledge and skills
  - methodological and structured way of working

Mona Dahms, "Establishing a Global PBL Community – the UNESCO Chair in Problem-Based Learning", Feb. 2008

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Achievements

- The UNESCO Chair in Problem-Based Learning in Engineering Education (UCPBL)
  - Established September 2007 at Faculties of Engineering, Science and Medicine, AAU
  - In recognition of many years of experience of PBL at the university
  - Aim: To promote and support PBL interests in engineering education worldwide
- Master in Problem-Based Learning in Engineering and Science (MPBL)
  - Aim: '..innovative teaching and educational experiments..'

Mona Dahms, "Establishing a Global PBL Community – the UNESCO Chair in Problem-Based Learning", Feb. 2008

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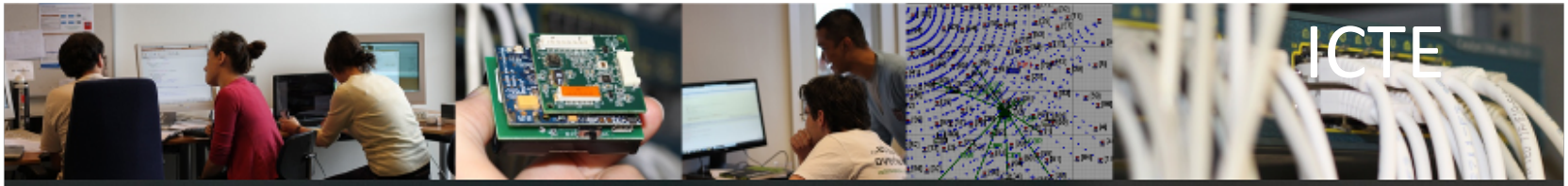
Conclusions

- Aalborg University has an almost 40 year tradition of project organized and problem based learning
  - Transferring teaching into learning
- Graduates are much appreciated in the industry
  - Better team and project skills and better in acquiring new knowledge and skills
- International recognized achievements in the area
  - UNESCO chair and master programmme

- CTIF's *Innovative Communication Technologies and Entrepreneurship (ICTE)* Master Programme embraces all aspects of Problem Based Learning



CONNECTING TO THE FUTURE

Thank you!

Innovative Communication Technologies and **Entrepreneurship** — CTIF Master Programme

http://www.ctif.aau.dk/Master+Program/