Promoting Problem Solving Skills

Prof. Stig Enemark

Aalborg University, Denmark
The Enlightened Globe

Source: NASA/REUTERS
The Enlightened Globe
Urban-Rural Interrelationships

Rural

Simi-Urban

migration

Urban

spread

Mega City

City

Town
Urban population growth

1970
RURAL 63%  URBAN 37%

2000
RURAL 53%  URBAN 47%

2030
RURAL 40%  URBAN 60%

Total world population: 6.5 billion
Total urban population: 3.3 billion
Total slum dwellers: 1.1 billion (100 mill. to be improved by 2015)
The Urban-Rural Interrelationship

- Sustainable Urban/Rural Living Conditions
- Urban / Rural Interrelationship
- Urban
- Rural
- Good Governance
- Good Land Policy
- Institutions & Governance
- Land & Natural Resource Infrastructures
- Capacity Building & Development
Problem Solving and Applied Science

1. Practical solution
2. Theoretical explanation
3. Method
4. Theoretical problem
5. Practical problem
6. Impressions, assumptions and theories
• **Management Skills** - versus specialist skills
  from traditional technical skills and push button technologies
  to interpretation and management of data meeting the needs of the clients

• **Project Organised Education** - versus subject based
  from traditional technical skills (knowing how)
  add-on approach
  to management and problem solving skills
  (knowing why)
  focus on ”learning to learn”
International Trends in Surveying Education

- **Virtual Academy** - versus classroom lecture courses
  - from traditional on-campus activities
  - to a more open role of serving the profession and the society

- **Lifelong Learning** - versus vocational training
  - from learning for life through university graduation
  - to lifelong learning through CPD-strategies and distance learning
Education, Research and Professional Practice

PRACTICE
Main fields
New fields

RESEARCH
Pure Science
Applied Science

EDUCATION
Disciplinoriented
Problemoriented

Theoretical answers
Practical problems
Theoretical answers
Practical problems
Theoretical answers
Practical problems
PBL - Key Points

- **Learning** rather than teaching
- **Problem-solving** rather than text-book knowledge
- **Project work** rather than class-room lecturing
- **Interdisciplinary approach** rather than subjects
- **Contextual understanding** rather than by heart knowledge
- **Applied Science** rather than pure science
- **Flexible concept** rather than fixed course standards
Project-organised and Problem-based Learning

1. Literature
2. Lectures
3. Internet
4. PROBLEM ANALYSIS
5. PROBLEM SOLVING
6. REPORT
7. Tutorials
8. Field Work
9. Experiments
Project Work
Key Philosophy

Tell me and I will forget
Show me and I will remember
Involve me and I will understand
Step back and I will act

*Chinese proverb*
The Aalborg Curriculum

Bachelor Degree

1. Basic Studies
2. Spatial Planning and Land-Use Management
3. Large Scale Mapping
4. Land Surveying
5. Cadastral Management
6. Land Manamagent

Master Degree

7. Land Manamagent
8. Spatial Information Management
9. Measurement Science
10. Internship - International Exchange - project work at AAU

11. Final Thesis

Semester:
1. 1st semester
2. 2nd semester
3. 3rd semester
4. 4th semester
5. 5th semester
6. 6th semester
7. 7th semester
8. 8th semester
9. 9th semester
10. 10th semester
Lecture Courses and Project Work

50% project work: a major assignment within a given subject-related framework determined for each semester.

25% project related courses supporting the project work. Evaluated as oral examinations based on the project report.

25% mandatory courses relating to the overall academic profile of the curriculum. Evaluated through individual written or oral examinations.
The Role of the Teacher

- A three-dimensional role:
  Lecturer (teacher), Supervisor (coach), Researcher (scientist)
- Focus on learning rather than teaching
- On-going renewal of lecture courses
- On-going and dynamic interaction between education, research and professional practice
The Educational Profile of the Future

- Measurement Science
- Spatial Information Management
- Land Management

Design/build/manage the natural/built environment and connected spatial/legal rights
Professional competence relates to the status as an expert.

This status cannot be achieved only through university graduation and it cannot be achieved solely through professional practice.

The idea of “learning for life” is replaced by the concept of lifelong learning.

All graduates must have access to the newest knowledge throughout their professional life.

E-Learning and innovative interaction between education, research and professional practice is essential in this regard.
Enhancing Professional Competence
http://www.fig.net/pub/CLGE-FIG-delft/report-1.htm
Summarising the Aalborg PBL Model

- **Problem Based Learning**
  - Based on real-life engineering problems

- **Project Organised Education**
  - Project work supported by lecture courses

- **Group Work**
  - Groups of four to six students
  - Supervised by the teachers

- **Interdisciplinary Studies**
  - Integration of theory and practice
  - Focus on Learning to Learn
M. Sc. - Chartered Surveyor Study Programme

New Curriculum September 2007

AALBORG

COPENHAGEN

Bachelor's Programme

1st semester
Maps & Spatial data

2nd semester
Site & Residential Planning

3rd semester
Spatial Planning & Land Use Management

4th semester
Large Scale Mapping

5th semester
Land Surveying

6th semester
Cadastral Management

Master's Programme

1st semester
Maps & Spatial data

2nd semester
Site & Residential Planning

3rd semester
Spatial Planning & Land Use Management

4th semester
Large Scale Mapping

5th semester
Land Surveying

6th semester
Cadastral Management

7th semester
Property Economics

8th semester
Geoinformation Technology & Management

9th semester
Internship - International Exchange - project work at AAU

10th semester
Final Thesis

* In co-operation with Faculty of Engineering LTH / Lund University
Thank you for your attention