# **Problem Based Learning**

#### Surveying Education in Denmark



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Department of Land and Property Science Namibia University of Science and Technology Windhoek, Namibia, 3 March 2016

### Denmark at a glance



43,000 sq. km

#### 5.5 mill inhabitants

# One third lives in the capital area

Flat country 70 % agriculture 10 % urban

### Wonderful Copenhagen



# **Greetings from Aalborg**



### Aalborg University – established 1974

Staff

1.600

400

450

450 600

3.500

2.100 1.400

HUMANITIES	SOCIAL SCIENCES	ENGINEERING AND SCIENCE	MEDICINE	
Department of Commu- nication and Psychology	Department of Sociology and Social Work	Department of Architecture, Design and Media Technology	Department of Health Science and Technology	
Department of Culture and Global Studies	Department of Culture and Global Studies	Department of Electronic Systems	Department of Clinical Medicine	
Department of Learning and Philosophy	Department of Learning and Philosophy	Department of Civil Engineering		
	Department of Business and Management	Department of Business and Management	Key numbers per 2	2014:
	Department of Political Science	Department of Computer Science	Eak of England Science	Students
	Department of Law	Department of Energy Technology	Fak. of Medicine: Fak. of Social Science:	1.700 6.000
		Department of Physics	Fak. of Humanities Central Administration.	4.700
		Department of Biotech- nology, Chemistry and Environmental Engineering	Total	20.600
		Department of Mathematical Sciences	Academic staff Administrative staff	
		Department of Mechani- cal and Manufacturing Engineering		
		Department of Development and Planning		
		Danish Building Research Institute		

# The Aalborg Model



### **Problem Based Learning**

Based on real-life 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

http://www.aau.dk/digitalAssets/148/148025\_pbl-aalborg-model\_uk.pdf

### **Educational Innovation**

through the interaction between education, research and professional practice



## Project-organised and Problem-based

#### **Project-organised:**

Taught courses assisted by actual practice is replaced by project-work assisted by courses.

From description and analysing to synthesising and assessment

#### Problem-based:

Textbook knowledge is replaced by the necessary knowledge to solve theoretical problems.

From understanding of common knowledge to ability to develop new knowledge.



"You only know things for sure when you are capable of explaining this knowledge to others"

### Project-organised and Problem-based Learning



### Lecture courses – project work ...



### Lecture Courses and Project Work

Project work:

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

Lecture courses

50 % mainly on subjects within the theme of the semester partly on subjects relating to the overall academic profile of the curriculum.



### Week schedule - example

0 1 5	Monday	Tuesday	Wednesday	Thursday	Friday
8.15	Lecture	Project	Lecture	Lecture	Project
	course	work	course	course	work
2.00	Lunch	Lunch	Lunch	Lunch	Lunch
12.30	Lecture	Project	Vacant	Project	Project
	course	work	(Meetings)	work	work

- A semester is equivalent to 30 ECTS points (900 hours of study)
- Each sem. includes 1 project module of 15 ECTS and 3 lecture course modules of 5 ECTs, in total 30 ECTS
- All modules are examined

### 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

## Project work: The Role of the Student

- Focus on learning rather than text book knowledge
- Focus on interdisciplinary learning and methodologies
- Using lecture courses as a basis for the project work
- Focus on co-operation in developing new knowledge
- Focus on responsibility towards completing projects in time

## 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



Intake 1<sup>st</sup> sem. Sept. 2014: 25 in Aalborg, 25 in Copenhagen, total 50 students

#### Bachelor Program, Lecture Courses 1- 6 Semester

Sem.	Module	ECTS
6	Cadastral Management Property data, consultancy, code of ethics Subdivision , land transfer, land registration Specific tasks of surveyors - legal property issues	20 5 5 5
5	<b>Position and mapping</b> Data capture and modelling Data management and assessment	15 5 5
4	Large scale mapping Surveying and mapping Error theory and map projections Rural areas - planning and administration Landscape analysis and rural land-use planning	5 5 10 5
3	Urban areas - planning and administration Urban and municipal planning Urban geographical methods Planning law and land -use management	15 5 5 5
2	Real property and development Calculus Theories and methods, geospatial science Legal and geographical analyses of areas	15 5 5 5
1	Surveyors – the professional profile Geographical information - places, data , models Problem based learning Surveying and spatial models Linear algebra	5 10 5 5 5
Total		180

### Master Program Lecture Courses 1-2 semester

and Compositor	Sensor and Data Integration		-	
Z <sup>ma</sup> Semester	Sensor and Data Integration			
Surveying and Manning	Small Scale Mapping Large Scale Mapping			
				-
	Statistical Methods in Surveying and Mapping			_
Geoinformatics		Geocomputation and Spatial Decision Support Systems Geovisualisation		Society Support
	Remote Sensing and Image Processing			ng
	Spatial Development and Plan		lanning	
Land Management			Development, Planning and Implementation	
			Land Use Regulation and Land Economics	
			Land Management and Governance	

#### 1<sup>st</sup> Semester Surveying and Mapping

**Geoinformatics** 

Land Management

Positioning
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Positioning Technologies

Spatial Data Infrastructure

Land Administration Systems

GI technology and Information Systems

Geospatial Information Technology

Spatial Data Infrastructure

Land Administration Systems

Land Development and Property Law

Real Property – Legal and Economic Aspects

Spatial Data Infrastructure

Land Administration Systems

#### M. Sc. - Chartered Surveyor Study Propgramme New Curriculum September 2007 **AALBORG**

#### **COPENHAGEN**

AALBORG UNIVERS

	Final Thesis Internship - International Exchange - project work at AAU		Final	10 <sup>™</sup> semeste	
nme			Internship - International Exc	9 <sup>th</sup> semester	
Master's Progran	Land Management	Measurement Science	Geoinformation Technology & Management	Property Economics*	8 <sup>th</sup> semester 7th semester
	Cadastral M	anagement	Cadastral M	anagement	6 <sup>th</sup> semester
	Land Su	rveying	Land Su	rveying	5 <sup>th</sup> semester
ime	Large Scale Mapping		Large Scal	4 <sup>th</sup> semester	
Program	Spatial Planning & Land Use Management		Spatial Planning & Land Use Management		3 <sup>rd</sup> semester
helor's	Site & Residential Planning		Site & Residential Planning		2 <sup>™</sup> semester
Bac	Maps & Spatial data Maps & Spatial data		1 <sup>st</sup> semester		

\* In co-operation with Faculty of Engineering LTH / Lund University

### The Quality Circle

Planning for the upcoming semester

Assessment and decisions by the Board of Studies



Ongoing evaluation and evaluation of lecture courses

Final evaluation from the students

"Without assessment of the completed semester - the students cannot expect to commence on a well-planned and improved semester"

### **Evolution of the Professional Profile in DK**



### The only constant is change

### Yesterday, Today and Tomorrow



# The Big Swing

### From Measurement

Surveyors will still be high level experts within measurement science, but due to technology development the role is changing into managing the measurements

### To Management

Surveyors will increasingly contribute to building sustainable societies as experts in managing land and properties

#### The Land Professionals

### Land Administration Systems



Land Tenure: Allocation and security of rights in lands; legal surveys of boundaries; transfer of property;
Land Value: Assessment of the value of land and properties; gathering of revenues through taxation;
Land-Use: Control of land-use through adoption of planning policies and land-use regulations at various levels;
Building of new infrastructure; implementation of construction works and the change of land-use

### **Geo-information**

#### ... creates a strong foundation



Source: ESRI

#### ...for sustainable action

### **Place matters**

Everything happens somewhere

"If we can understand more about the nature of "place" where things happen, and the impact on the people and assets on that location, we can plan better, manage risk better, and use our resources better."

Location Strategy for United Kingdom, 2008

"Heading toward spatial enabled society"

### The Educational Profile of the Future



### The Professional Challenge



- 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

## Thank you for your attention

