Surveying Education:
Facing the Challenges of the Future

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NAVIGATING THE FUTURE OF SURVEYING EDUCATION
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Welcome to beautiful Vienna
Is the role of the Surveyors changing?
The big swing

- **From Measurement**
  Surveyors will still be high level experts within measurement science, but due to technology development the role is changing more 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 Governance

Do Surveyors have a role to play in the future? – and in the global agenda?

No development will take place without having a spatial dimension

No development will happen without the footprint of the surveyor
The role of the land professionals

Dealing with the land issue will require skills in the following areas:

- High level geodesy models to predict future change
- Modern surveying and mapping tools to support management and implementation
- Spatial data infrastructures to support decision making on the natural and built environment
- Secure tenure systems
- Sustainable systems for land valuation, land use management and land development
- Systems for transparency and good governance

Land governance is an interdisciplinary and cross-cutting area mixing technical, natural and social science
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
Trends and Challenges in Surveying Education (1) ...

- **Management Skills** - versus specialist skills
  from traditional technical skills and push button technologies
to interpretation and management of data for meeting the needs of the clients – towards the Land professionals

- **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”
• **Flexible Curriculum - versus fixed course structure**
  
  from fixed disciplines and lecture courses  
  to flexible course curriculum that can accommodate  
  the ongoing change in disciplines and professional practice.

• **Virtual Academy - versus classroom lecture courses**
  
  from traditional on-campus activities  
  to Web based course delivery and a more open role  
  of serving the profession and society
• Quality Assurance - versus fixed standards
  from traditional course delivery
  to ongoing monitoring and evaluation for constant improvement and innovation

• Lifelong Learning - versus vocational training
  from learning for life through university graduation
  to lifelong learning through CPD-strategies and distance learning
And... promotion for attracting students
Facing the challenges

- Lack of students
- Too big a gap between supply and demand
- Option for double degree and new specialisations in cooperation with Lund University, Sweden
- Option for offering a range of specialisations as master programmes under the Bologna agreement.
- Option for offering the program also in Copenhagen

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Rate of unemployment < 1%
Trends and Challenges in Surveying Education (1) ...

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Learning to Learn

Professional and technical skills can be acquired and updated later in one's career, while skills for problem solving and skills for learning to learn can only be established through the process of academic training at the universities.

Skills of dealing with the unknown problems of the future
Lecture courses – project work …
Project-organised and Problem-based Learning

Literature → Lectures → Internet

PROBLEM ANALYSIS → PROBLEM SOLVING → REPORT

Tutorials → Field Work → Experiments
The Aalborg Curriculum

Bachelor Degree
- Basic Studies
- Basic Studies
- Spatial Planning and Land-Use Management
- Large Scale Mapping
- Land Surveying
- Cadastral Management
- Land Managemenat
- Spatial Information Management
- Measurement Science
- Internship - International Exchange - project work at AAU
- Final Thesis
M. Sc. - Chartered Surveyor Study Programme
New Curriculum September 2007

AALBORG

COPENHAGEN

Final Thesis

Internship - International Exchange - project work at AAU

Land Management

Measurement Science

Geoinformation Technology & Management

Property Economics*

10th semester

9th semester

8th semester

7th semester

Cadastral Management

Land Surveying

Large Scale Mapping

Spatial Planning & Land Use Management

Site & Residential Planning

Maps & Spatial data

Cadastral Management

Land Surveying

Large Scale Mapping

Spatial Planning & Land Use Management

Site & Residential Planning

Maps & Spatial data

6th semester

5th semester

4th semester

3rd semester

2nd semester

1st semester

* In co-operation with Faculty of Engineering LTH / Lund University
Project-organise and problem-based learning

• **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

**Facilitating the learning process of the students**
• **Flexible Curriculum - versus fixed course structure**
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  to flexible course curriculum that can accommodate
  the ongoing change in disciplines and professional practice.

• **Virtual Academy - versus classroom lecture courses**
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  to Web based course delivery and a more open role
  of serving the profession and society
Monitoring change...

Evolution of the surveying profession in DK over 40 years

Surveyors employed (outside the survey firms)

Private practice owners

Private practice employed surveyors
Flexible curriculum to accommodate change

Evolution of the professional profile in DK over 40 years
Educational Profiles in Europe

Germany, Bonn (4.5 years)

Common content

Option SM

Option GIM/LM

Denmark, Aalborg University (5 years)

Common content

Option SM

Option LM

Core subjects
- Real Estate Economics (REE)
- Land Management (LM)
- Geographical Information Management (GIM)
- Surveying and Mapping (SM)

Support subjects
- Other
- Maths, statistics, data etc. (Maths)

Enhancing Professional Competence of Surveyors in Europe
...Trends and Challenges in Surveying Education (2)...

- **Flexible Curriculum - versus fixed course structure**
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of serving the profession and society
Virtual Academy

- **Web-based course provision**
  - Lecturing based on virtual learning documents

- **Web-based course libraries**
  - Available for ongoing improvement
  - Available for professional practice

- **Web-based spatial data libraries**
  - Available for courses and project work

- **Web-based distant learning courses**
  - Offered as CPD activities, summer schools etc.
  - Integrated platforms for professional knowledge
• **Quality Assurance - versus fixed standards**
  
  from traditional course delivery
  
  to ongoing monitoring and evaluation for constant improvement and innovation

• **Lifelong Learning - versus vocational training**
  
  from learning for life through university graduation
  
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Quality Management

• Structural Challenges
  - Local level: Department structures
  - National level: Performance criteria, resources
  - International level: Agreements such as Bologna
  - Call for leadership, focus on the professional competence of the graduates

• Accreditation, monitoring and assessment
  - Evaluation towards minimum standard criteria
  - Monitoring the labour market of the graduates
  - Establishing and Advisory Boards of stakeholders

• Creating a quality culture
  - Internal monitoring
  - Handbook of Quality Management
  - Quality circle
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
Trends and Challenges in Surveying Education (3)

• **Quality Assurance - versus fixed standards**
  
  from traditional course delivery  
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• **Lifelong Learning - versus vocational training**
  
  from learning for life through university graduation  
  to lifelong learning through CPD-strategies and distance learning
Lifelong Learning

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.
Facing the challenges requires an innovative and adaptable approach to both curriculum design and course delivery within the framework of an overall quality culture.

The success will eventually depend on an efficient interaction between education, research, and professional practice.
Thank you for your attention