

**Teaching Geodata Acquisition**  
- E-Learning Experiences and Sustainability -

*FIG Working Week 2005 and GSDI 8*

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**Structure**

1. Introduction
2. E-Learning Projects
3. Content of E-Learning Moduls
4. Technical Realization
5. Integration of Physical and E-Learning
6. Quality Assurance
7. Sustainability

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**1 Introduction**

- History of academic teaching: from black-board to computer presentations and further to internet-based learning (e-learning).
- Besides: self-study phases by repetition and with the help of textbooks exist ever since.
- Later: self-study phases by electronic information sources or by internet.
- Generally: pure internet-based learning is only successful in a few cases.
- Thesis:  
**Combination of physical teaching and self-study phases via the internet is the future !**

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**2 E-Learning Projects at IAGB**

- Gimolus GIS- und modellgestützte Lernmodule für umweltorientierte Studiengänge / learning modules for GIS and modelling in environmental courses
  - Institute for applications of geodesy to engineering (IAGB)
  - Institute for Photogrammetry, University Stuttgart
  - Institute for landscape-planning and ecology, University Stuttgart
  - Institute of Hydraulic Engineering, University Stuttgart
  - Landscape Ecology Working Group, University of Oldenburg
  - Field Station Fabrikschleichach, University of Würzburg
- 100-online and self-study-online projects granted by University Stuttgart

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**3 Content of E-Learning Moduls**

Structure of e-learning moduls according to IMAP-model

Moduls for Import resp. geodata acquisition

Realized moduls  
only in german    only in english    bilingual

ActiveMap  
ActiveGeo

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**Target Groups**

Course	Speciality
<b>Data Acquisition and Management</b> <b>Primary target group</b>	<b>Infrastructure Planning (MSc)</b>
Acquisition and management of planning data (German)	Technique and economy of real estate (diploma)
Surveying for architects (German)	Architecture and urban planning (diploma)
Surveying for construction engineers (German)	Construction engineering (diploma)
Thematic Cartography (German)	Geodesy and Geoinformatics, Geography (both diploma)

- Exercises acknowledged by tutor
- Modules relevant for examinations

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## 4 Technical Realization

**System architecture of gimolus platform**

Central element:  
virtual landscape

technical elements:

- WebGIS (ArcIMS)
- PHP
- Macromedia Flash

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## WebGIS - Architecture of gimolus

GIS realization by two possibilities:  
**ArcGIS via Citrix Metaframe and ArcIMS (real WebGIS)**

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## Example for WebGIS-Application

Application via ArcIMS within the modul „Mapping“:  
Exercise to learn basic mapping functions like measurements of distance, heights and coordinates.

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## Example for Title Page (Modul „Mapping“)

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## Example for Animation

Animation application within the modul „terrestrial positioning methods“:  
exercise to visualize and learn about the structure of a theodolite.

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## 5 Integration of Physical and E-Learning

theme:	4.1 terrestrial positioning methods	4.2 satellite-based positioning methods	5.1 mapping
teaching:	lecture, field exercises	lecture, field exercises	lecture
Self-study:	gimolus: exercises & postprocessing		

Combination of physical teaching and e-learning

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## 6 Quality Assurance

- Prototype Evaluation**  
presentation of an incomplete module („prototype“) to the students

ISO Norm #242/10-questionnaire	Prototype-Workshop
<ul style="list-style-type: none"> <li>suitability for learning</li> </ul>	<ul style="list-style-type: none"> <li>glossary</li> <li>readability</li> <li>help-button</li> <li>unique animations</li> </ul>
<ul style="list-style-type: none"> <li>suitability for individualization</li> </ul>	<ul style="list-style-type: none"> <li>bookmarks</li> <li>download</li> <li>personal highlighter</li> </ul>

← used evaluation tools

10 students of infrastructure planning in 2002 explored the modules „Terrestrial Measurement“ and „Mapping“ and used the two evaluation tools

**used for further development**

**not integrated due to lack of time and money**

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## Evaluation of E-Learning Moduls

- use of a special questionnaire
- 6 to 18 students per module and speciality; in total 92

Experiences of different target groups

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## Evaluation of E-learning System gimolus

- positive judgement by all three test groups
- „infrastructure planning“ students appreciate the system the most

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## Evaluation of Moduls

Box plots for the different items using all 10 evaluations

- average values are fairly good for all modules
- sometimes variation is quite large, e.g. „learning success“

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## Evaluation of Item „learning success“

**Influence by setting of the students:**

- previous knowledge !
- modules relevant for examinations !

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## Results of Evaluation

- Prototype evaluation is an important tool
- Integration concept for physical teaching and e-learning moduls was evaluated positively - including also the e-learning platform and the single moduls
- Different target groups sometimes came to different evaluatio results ⇒ high variation !
- Anchorage of e-learning moduls in the curriculum is important for acceptance by the students

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**7 Sustainability**

- **Problems:**
  - assurance of further technical working,
  - update of the e-learning contents.
- The solution of these problems is mainly a financial problem !
- **Concepts for sustainable maintenance:**
  - 1) new project money
  - 2) collection of fees from academic institutions
  - 3) introduction of life-long learning activities

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~~Concept 1: New project money~~ again: only temporal financing

**Concept 2: Fees from academic institutions**

- assures technical maintenance
- realized by three gimolus partner institutes at University Stuttgart

**Concept 3: Life-long-learning**

- dual use for academic teaching as well as for life-long-learning
- assures technical maintenance and content update
- first implementation is pushed forward
- concept for the future !

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**Thank you very much for your attention !**

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