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!

2 E-Learning Projects at IAGB

- Gimolus 100
  GIS- und modelgestützte Lernmodule für umweltorientierte Studiengänge / learning modules for GIS and modelling in environmental courses
- Institute for Photogrammetry, University Stuttgart
- Institute for landscape-planning and ecology, University Stuttgart
- Institute for 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

3 Content of E-Learning Moduls

Structure of e-learning modules according to IMAP-model

Realized modules
- only in german
- only in english
- bilingual
4 Technical Realization

System architecture of gimolus platform

Central element: virtual landscape

Technical elements:
- WebGIS (ArcIMS)
- PHP
- Macromedia Flash

WebGIS - Architecture of gimolus

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

Example for WebGIS-Application

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

Example for Animation

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

5 Integration of Physical and E-Learning

Combination of physical teaching and e-learning
Prototype Evaluation

Presentation of an incomplete module ("prototype") to the students

- Used for further development
- Not integrated due to lack of time and money

**Results of Evaluation**

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

**Evaluation of Item „learning success“**

**Evaluation of E-Learning System gimoLus**

- Positive judgement by all three test groups
  - "Infrastructure planning" students appreciate the system the most

**Evaluation of Modules**

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“
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

Concept 1: New project money
- assures technical maintenance
- realized by three gimolus partner institutes at University Stuttgart

Concept 2: Fees from academic institutions
- 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!

Concept 3: Life-long-learning
- again: only temporal financing

Thank you very much for your attention!