Hochschule Reutlingen
Reutlingen University

INF
Informatik

Scheduled Flexibility and Individualization of Knowledge Transfer in Foundations of Computer Science

Prof. Dr.-Ing. Oliver Burgert
Dipl.-Päd. Irene Merdian

Initial situation

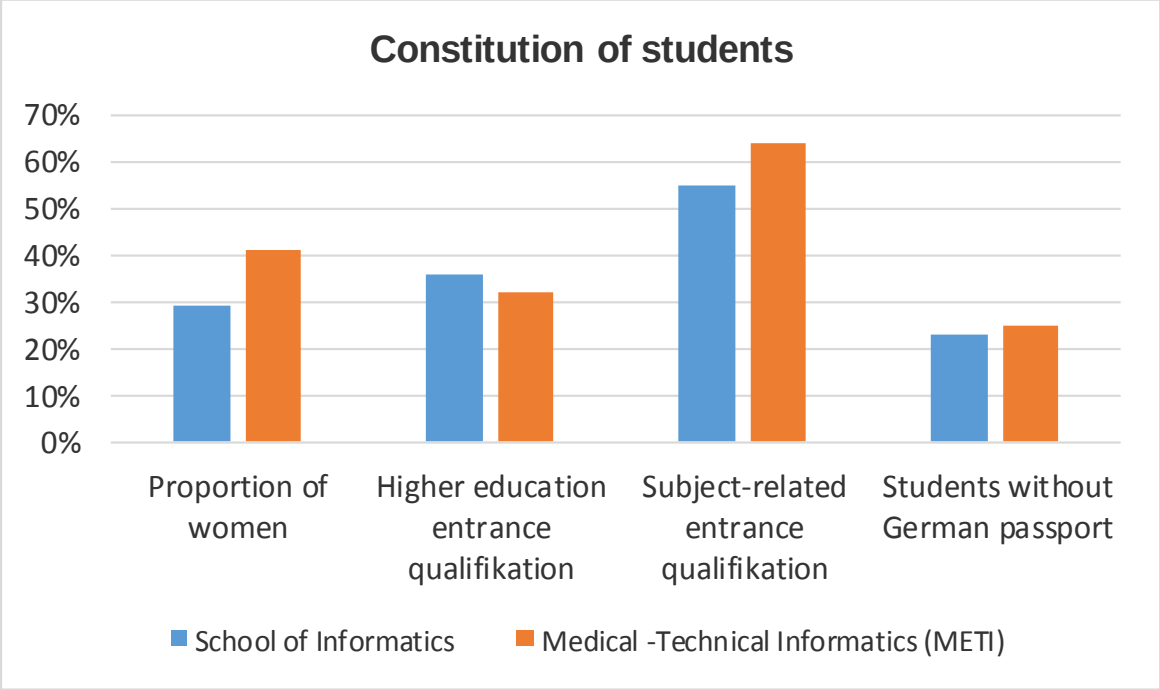


Fig. 1. Constitution of students in School of Informatics at Reutlingen University

Impact of the students heterogeneity

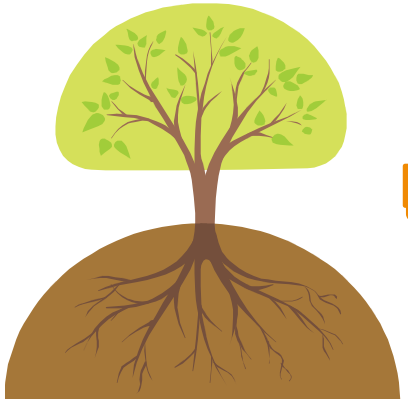
- Unequal biographies
- Different previous knowledge
- Diverse access to course content
- Different learning methods

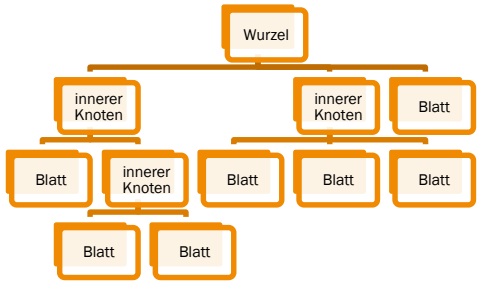
Flexibility and individualization of knowledge transfer by

- Outbreak of classical teaching
- Using eLearning, supplemented by lectures, in which the new knowledge will be connected and applied to new competences
- Each content of the lecture will be presented at different levels of abstraction

Example: Topic „tree“ (data-structure)

Short summary for non-computer-scientists:





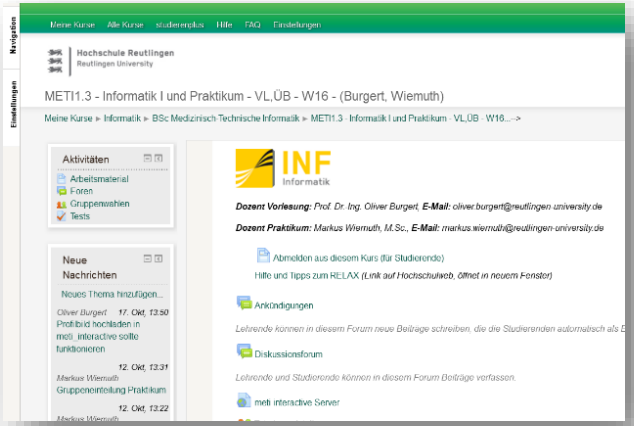
Short reminder for computer-scientists:

Example: Topic „tree“ (data-structure)

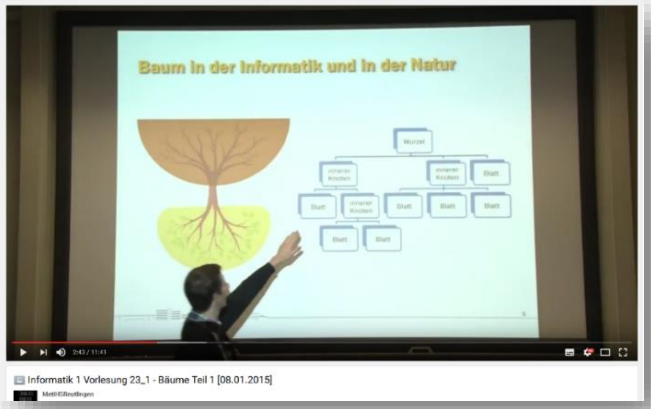
Learning target / Skills	To implement binary trees in a programming language To determine the runtime of tree algorithm To know different search trees
Preconditions / Preknowledge	Knowledge of fundamental data structure Knowledge of controlling structure Knowledge of programming languages
Levels of knowledge	Middle level Derivative level IT-Specialist
Connection with other topic areas	Running time calculation Graphs
Reprimands	Digital learning content References
Additional topics	Complex tree algorithm Derivation of upper and under bounds on the execution time
Exercises / Case studies	Programming assignment in different programming languages

Fig. 2. Example of a description of the abstraction categories

Already used eLearning



[https://learncodethehardway.org/]



[https://www.udacity.com/]

Research questions to be answered during the project

- Do open learning arrangements using eLearning foster the development of knowledge?
- What influence does the abstraction of the content have on the learning process?
- Which skills are necessary for self-directed learning?
- What are the effects to learning motivation and thus also to study success?
- What are the challenges and limitations?

Thank you for your attention!