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Part IV: Teaching Methods for Computer Science

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Content

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- Allocation in the planning and execution process
  - Learning assignments
  - Group work
  - Guided programs
  - Discovery Learning
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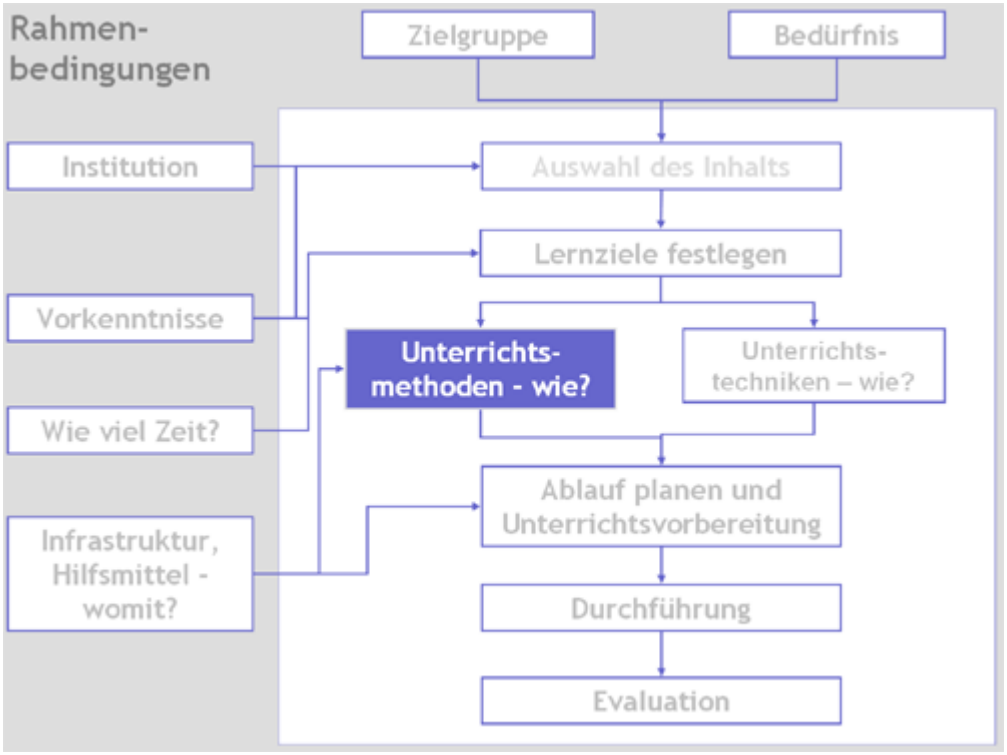
Motivation

- Pure lecturing faces the fact that it tends to bore students by repeating the same form of teaching for a lot of different content.
- Especially education in computer science encounters a huge variety of prior experiences
- A wide set of different teaching methods helps to keep the lessons interesting, versatile und suitable for all students

Allocation in Planning Process



- “How to convey knowledge”
- Defining a general script for a whole topic, problem or a lesson

Learning assignments

- After an introductory part of the teacher, the students get an exercise to solve by themselves
- The exercise mostly is a programming or a technical task.
- A learning assignment usually lasts 10 to 30 minutes

  - Each student may proceed at his own speed
  - All students work on the given task and may solve it on their own.

Group Work

- In Group Work a task is given to a small group of students.
- The group is working on its own on the given job and becoming an expert on the field they are assigned to.
- Depending on the kind of Group Work, the students of the group may spread their expertise among the others afterwards

  - Team work skills and independent working are imparted

Guided Programs

- In Guided Programs the focus is set on maters for self-study
- The Progress of the program is determined by the speed of the individual and not by the teacher`s speed

  - “Expert”-students may learn at their own high level of capacity
  - Beginners do not need to compete with them

Discovery Learning

- Competing a difficult problem individually, students develop solutions by themselves.
- As there is not given a one right solution to a specific problem he is more likely to try own individual, more creative approaches.

  - Discovery Learning shall lead to self-confident solution-oriented working

Project Work

- A group of students works together for a longer period of time (e.g. a Week) on a common project.
- The work is divided; responsibility for parts of the project is given to individuals or small subgroups

  - Project Work supports Team Work as well as Independence
  - A big project shows the necessity of more detailed planning processes

Summary

- All new concepts mean an individualization of the work; tasks are fulfilled by a single student or a small group.

- The tasks and the time to solve them depend on the degree of expertise of the students.

Discussion

- What are fair grades if everybody is working on totally different levels of achievement?
- Is it demotivating if the “good” and the “bad” students get different tasks?
- Is it waste of knowledge, if the teacher as an expert of his field stands back instead of using most of the time in lecture?
- Will the different degree in expertise grow, if the more interested students get the more difficult tasks?

Thank you for your attention!