Exploring and Evaluating Computing Systems for Use in Learning Scenarios by Creating an E-Portfolio
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Overview
- One semester course for CSE master’s students (8 participants)
- Learning goals: recognizing and reconfiguring of computing systems, experience with setting up basic computing systems, discussing computing systems in CS at school
- Structure: class sessions (10 weeks) + individual project (5 weeks)
- Scenario: experiential learning, reflection tasks and e-portfolios

Practicing Experiential Learning
- Active participation encouraged in their own learning through reflective practice has become an established position [1]
- Encouragement of deeper understanding and the comprehension of one’s own learning process [2,3]

Creating E-Portfolios

Sessions
- Theoretical Foundations (4 sessions)
  - Assessment: students’ prior knowledge in word clouds
  - Sharing a knowledge base: research on information on computing systems → also: starting point of e-portfolio
  - Recognizing computing systems: by taking and collecting photos
  - Towards an analytic view: classifying results on virtual pinboards
  - Sharpening the analytic view: a model for three perspectives on computing systems is introduced [5]
  - Bringing together didactic theory and complex systems: Introduction of smartlights: demonstration and analysis (by use of „didactic reduction and reconstruction“ [6])

Experiential Learning (5 sessions)
- "Especially when students learned about network layers in CS classes, we can now use this knowledge in projects asking for the theory behind."
- "My knowledge about networks helped me understand the setup and the processes of the example. It did not help me with the installation, though."
- "Taking not into account my personal difficulties – I am convinced CS teachers should be able to build up a WAR."
- "For me the App Inventor followed Snap and Scratch which I am familiar with. So I could successfully enhance my experiences."

Development of Computing Systems for Learning Scenarios (5 sessions) & Presentation and Discussion (2 sessions)
- Individual projects: students are free to choose upon interests
- Going through a development process: theory-based analysis, reconstruction of a simplified version, setup, implementation and rich documentation
- Open collaborative lab sessions: students discuss and help each other, learning follows individual steps and needs
- Learning exercises: creating a task for the course prepares for future teaching and shifts interest to students’ needs
- Presentation: overview of the diversity and inspiration

Global Summary
- Design of the Class Sessions
  - The experiential learning design proved to be motivating for the students
  - Different prior knowledge requires therein both basic and challenging tasks

- Results from Individual Work
  - E-portfolios appear as creative personalized work but with overall high achievements
  - Experiential learning has led to personal yet professional reflection

References
[6] Professional Growth. Teaching and Teacher Education 18, 8 (2002), 947

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