Experience in Early and Late Software Engineering Project Courses

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Where is Dresden?
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Software Engineering Education (1)

- Bachelor degree (6 semester) or master degree (9 semesters)
- Part of Computer Science education
- Students may choose SE as a specialization
- Main focus on OO techniques, teamwork
Software Engineering Education (2)

● Curriculum

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>SE1 lecture + exercise</td>
</tr>
<tr>
<td>4</td>
<td>Basic Project Course</td>
</tr>
<tr>
<td>5</td>
<td>SE2 lecture + exercise</td>
</tr>
<tr>
<td>6</td>
<td></td>
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<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Complex Project Course</td>
</tr>
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<td>9</td>
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</table>

Bachelor

Master

Degree in CS
Basic Project Course (1)

- First hands-on experience in SE
- Our challenge
  - Lead students to good OO craftsmanship
  - Hundreds of students
    - 600 students next semester!
- Our technical solution
  - Using a domain framework (SalesPoint)
  - Domain: sales applications
  - Tasks have simulation character
Basic Project Course (2)

- Our organizational solution

  supervisor

  consultant and customer

  project team

  2 university staff

  25 senior students

  100 teams of circa 6 students
Basic Project Course (2)

- Our organizational solution

  - 100 teams of circa 6 students
  - 25 senior students
  - 2 university staff
  - 100 teams of circa 6 students

- Project team success rate about 90% !
Complex Project Course

- Advanced theoretical and medium practical skills
- Our challenge
  - High complexity and moderately realistic tasks
- Our solution
  - Task with requirements derived from real customers
  - Most intensive support from university staff
  - Larger project teams (9 members)
  - No predefined architecture and technology
Comparison

**Organization of the project courses**

<table>
<thead>
<tr>
<th></th>
<th>Basic Project Course</th>
<th>Complex Project Course</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of project teams</strong></td>
<td>25 .. 100</td>
<td>1 (to be enlarged in future)</td>
</tr>
<tr>
<td><strong>Members per project teams</strong></td>
<td>4-6</td>
<td>8-10</td>
</tr>
<tr>
<td><strong>Project time</strong></td>
<td>13 weeks</td>
<td>almost half a year</td>
</tr>
<tr>
<td><strong>Mentored by</strong></td>
<td>senior students</td>
<td>teaching and research staff</td>
</tr>
<tr>
<td><strong>Consultation</strong></td>
<td>once per week</td>
<td>on demand of the students</td>
</tr>
<tr>
<td><strong>Project deadline</strong></td>
<td>hard</td>
<td>soft</td>
</tr>
</tbody>
</table>
Experience & Lessons learned (1)

- There are never too many project courses!
- OO analysis is hard work!
- Often, students do not use documents created during early software development phases as tools for their project work!
- Architecture and OO design needs much experiences!
- The framework-based approach is suitable for beginners!
Experience & Lessons learned (2)

- Real tasks motivate students to complete their work!
- Students underestimate the project effort!
- A strict deadline is a powerful tool for project success!
- Coding and testing are mostly trouble-free!
Open Issues

- Determine the success rate of individual project team members
- Transfer Basic Project Course in industrial environments
- Increase number of teams of the Complex Project Course
Thank you for your Attention!

Questions are welcome
Dresden University of Technology

- Was founded in 1828
- Largest university in the German state of Saxony
  - 27,600 students and 4,500 employees, including about 600 professors.
- 14 faculties cover a wide range of fields
  - science and engineering,
  - humanities,
  - social sciences and
  - medicine
Students can earn a bachelor’s degree (6 semester) or a master’s degree (9 semesters)

Courses of Study
- Computer Science
- Information and System Technology
- Multimedia and Computer Science
- Postgraduate Study in Software Engineering
- and further