GREat
Grupo de Redes de Computadores
Engenharia de Software
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UNIVERSIDADE FEDERAL DO CEARÁ

TEACHING SOFTWARE ENGINEERING IN DC/UFC

This briefing reports scientific evidence on the experience of teaching software engineering during the last decade in the Federal University of Ceará.

FINDINGS

The main finding is the Software Engineering (SE) teaching process, as well as the results obtained with its use during the last ten years.

The process has three roles: professor, who defines the scope and the activities performed during the course; monitor, who is an assistant of the professor in the execution of the activities; and student, who takes part in practical and theory classes and executes the activities related to the practical work.

To sum up, this process involves activities related to:

- The course planning, such as "Preparing the communication environment" and "Identifying the Students' Profile";
- The execution of practical and theory classes according to the course planning. For instance, for the practical classes, classroom dynamics are used to improve the students learning. These dynamics are related to the concepts addressed in the course. The objective is to use the software engineering in practice.
- The development of software by the students. They should define the scope and requirements of the application.
- The development of the assets (e. g., Project Charter, Scope, Project Management Plan, Test Plan) related to the software development project. Using an interactive cycle, students develop the assets, whereas the monitors and the professor validate them and send improvement tips to the students, who should correct the assets according to the review.

In general, with the use of the process, we observe that the students' grades have increased over the years.

The process models most used by the students during the software development were the Prototyping and the Iterative and Incremental Process. They also presented the best results in the final evaluation.

Based on a survey with the monitors, two activities were considered the most challenging ones: teaching classes and checking the assets. In the first one, the monitors should support the professor defining and preparing the classes. In the other one, the monitors should evaluate the assets created by the students.

We identified eight lessons learned.

- To use the process, the students should be separated into teams with at least six members. Also, this group should be treated as a software development company. In this case, each member assumes a role, as manager, requirements analyst or test analyst, among others.
- The first lesson concerns to the definition of the student groups. When the students organized the groups themselves, they usually formed groups by personal affinity. Then, to simulate a real scenario of the software development industry, the groups were defined randomly.
- Initially, we used only e-mail in our communication. However, with the evolution of the communication media, we also use the system of the university, e-mail, Whatsapp, and Facebook to a better interaction with the students.
- The use of a tool to manage and control the activities of the course is critical to the success of the student's project. We suggest the use of Trello, an online Kanban board.
- To register the activities related to the SE course, we observed the need for creating a manual with the responsibilities and the activities to be performed by monitors.
- For the contents applied during the creation of the assets, but not explored during the course, the monitors prepared and taught extra classes. For example, the UML diagrams or Android technologies to help the students developing the final application. Also, to stimulate the students to be present in the classes, we gave them a bonus on their grades.
- Also in order to stimulate the students, we defined a delivery of the application in app stores, like Google Play.

Keywords:
Teaching-learning process
Software Engineering

Who is this briefing for?

Professors and any software engineering practitioners who want to teach Software Engineering.

Where the findings come from?

All findings of this briefing were extracted from the analysis of the last ten years of the teaching of Software Engineering in DC/UFC conducted by Andrade et al.

What is included in this briefing?

The process defined and the activities and roles involved in the teaching of Software Engineering, as well as the lessons learned during its use.

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