



Incorporating industry in Object Oriented Programming in order to provide a sustainable learning process

(Resource ID: 276)

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This teaching resource is allocated to following University:

UC - Universum College

Institution:

Universum College

<http://www.sustainicum.at/en/modules/view/276.Incorporating-industry-in-Object-Oriented-Programming-in-order-to-provide-a-sustainable-learning-process>



Group work



**Less than 5
students**



up to 1 semester



English, Shqip

Please note: module with excess length - more than 7 lecture units required!



Implementation of real case scenarios will provide students with a theoretical and practical means of understanding and applying object oriented programming. The direct contact with clients coming from the industry or from various businesses/social businesses, and the preliminary scenario analysis present a starting point for student's software development. This teaching material

involves problem based learning that enables student's critical evaluation while facing real software requirements. Consequently, it provides a sustainable material that is not beneficial only for students but also for the community around.

Communication lines between the programmer and the client is crucial in providing a software product which meets the predefined and required functionalities. Therefore, software engineering provides methods, graphs and diagrams that help students visualize client requirements and enables them to get a better interpretation from a middle point that both the client and the programmer understand. Even though, the direct contact with client and the well-defined software requirements present a starting point in software development, they are very important in the whole programming process. The software engineering processes are not applicable and well known in the Kosovo market. Therefore, students should be prepared to face different clients with various requirements, and be able to correctly understand them towards implementing an application, which is what we have identified as a gap.

Linking theory and practice provides a teaching method that enables sustainable learning of the programming paradigm. The idea is to enable direct contact of students with clients coming from different local businesses. These clients will explain to students about their system requirements. Therefore, students will start with a system analysis (scenario analysis). After that, a continuous theoretical base that will be provided during the lectures, and students will work in parallel in the implementation of the software product. Concepts learned during the lectures will be applied directly in the provided problem (problem based learning).

The purpose of this teaching method is twofold. The first aim is student understanding and the application of programming concepts. Secondly, this learning material will provide the industry a possibility to meet with students, test their programming skills, enable students working for them and finally having a possible software product for free. This idea will provide motivation for students that are future-coming developers, to work harder during their studies, and possibly get employed based on skills shown during this testing work. Sustainable learning and a contribution to the community is seen as important considering the percentage of unemployed in Kosovo.

At the end of the semester, when the case study work is finished, the group of students will present their work in front of the class and clients. If satisfied the client may have the product and possibly employ any of the

students. Final assessment will be based on group mark and the peer assessment mark.

Teaching Tools & Methods



Excursion Mini-project Computer program

Integration of Social Stakeholders

Businesses are involved in the learning method as active partners. They will have their meetings with the group of students in order to explain to them their system requirements. Hence, students will have the possibility to directly face the real system requirements and challenges that software development imposes. Potential businesses will benefit from possible ideas and perspectives that the software product enables for the sustainable management of their business. Furthermore, they will have a software product that will help them in their everyday work/social activities for free.

Strength

- Active learning experience for students
- Application of theoretical base on a real case study
- Students learn to develop a sustainable software product
- Stakeholders benefit software building
- Students think about their own opportunities and responsibility in the context of meeting client requirements
- Students enforce their decision making and critical thinking

Weakness

- The possibility of not finalizing the software product
- Confidentiality problems- clients may hesitate to provide their business information to students
- Great number of hours needed to successfully finish the software product, thus, there is a risk of lack of commitment by students
- Few meetings- clients may not have time to organise regular meetings

Learning Outcomes

- Provide a real experience with a client from the industry while facing their requirements
- Decision making and critical thinking of programming methods and concepts to be applied
- Present the work in front of an audience
- Reasonably evaluate the work of group members- peer assessment

Relevance for Sustainability

- Sustainable learning through facing real world problems
- Business clients involvement
- Application of software products that will help sustainable business management
- Presentation of skills that will enable employment

Related Teaching Resources

- Students must have successfully passed the Introduction to Programming and Web Technologies Module – Basic knowledge of public speaking – Good communication skills and cooperation with the client

Preparation Efforts

Medium

Preparation Efforts Description

–Preparation for the lecturer: each week lectures introducing concepts that will be applied through student's case studies and organization of client-students meeting – Students need to have: some basic understanding of programming (previous course, Introduction to Programming and Web Technologies) and public speaking skills

Access

Free

Assessment

Group marks and peer assessment.

Credit/Certification Description

– This teaching resource includes regular lectures (10 lectures of 2 hours each) and work with groups of students 2 hours per week. – Students will work in parallel developing and implementing the software which is supposed to take 120 hours.

Sources and Links

Dan Clark, "Beginning C# Object-Oriented Programming", Second Edition

Stephen Wong and Dung Nguyen, "Principles of Object-Oriented Programming", Sep 8, 2011

Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", Third Edition

<http://www.objectmentor.com/resources/articles/umlClassDiagrams.pdf>

<http://www.yyu.edu.tr/abis/admin/dosya/5637/files/UML%20Tasar%C4%B1m.pdf>

http://ima.udg.edu/~sellares/EINF-ES2/uml2_diagrams.pdf

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