



## Project IMPRESS: higher software quality through gamification in educational programs

**Nowadays people and society are more and more dependent on software quality. Software determines our daily lives, our social and business lives. That's the reason demands on software quality are ever-increasing and optimal testing of software has become a necessity. But is testing what really happens in practice? And for that matter, is the IT educational system responding to these demands in an adequate way? The answer is 'no'. The IMPRESS project, launched recently as an initiative of the Open University amongst others, hopes to fill the gap by introducing gaming elements into software engineering educational programs.**

Software engineers do their utmost in trying to develop high-quality software that meets all modern requirements. To achieve this goal there are various techniques available, like extensive testing of software before it will be actively deployed. However, practice shows us that these techniques are insufficient or aren't even applied at all. In general, computer science education is also lagging behind.

With the IMPRESS project, the initiators want to tackle the problem by introducing gaming elements into software engineering training courses. According to Professor Tanja Vos, Professor of Software Engineering at the Open University, "software engineering programs still focus too often on the creative aspects of design and coding. While more labor-intensive and perhaps less entertaining activities, such as software testing, are being largely ignored. However, testing is essential in order to develop high-quality software. This lack of attention to software quality then spreads to practice, with all its consequences."

### Shift

According to Vos, a fundamental shift in the way software engineering is being approached and taught is therefore necessary. "Tomorrow's software engineer must be taught and trained with more respect to the quality of the software he or she is developing. Techniques to guarantee this quality, like extensive testing of software, must become an essential and natural part of software development, rather than the peripheral phenomenon that they are today."

## IMPRESS

This was one of the reasons why the IMPRESS project was set up in the first place. IMPRESS - an initiative of the Open University, Utrecht University, Universidad Complutense de Madrid and INESC-ID Lisboa - is trying to bring about the necessary shift in attitude by introducing the gamification element and gaming principles into software engineering educational programs. Vos: "With IMPRESS, we'll try to create more awareness among students for testing and other relevant issues by using gaming elements and principles. In other non-game related settings this concept has proven itself profoundly, so here too we expect a lot."

## Quizzes

The goal of IMPRESS is to 'gamify' the theory of software engineering through a series of reusable, freely accessible multiplayer quizzes. Vos: "It is our intention that these quizzes will be played live by the students in the classroom. The quizzes are short, but because of the competitive element they do provide the necessary commitment. In this way, we not only want to promote the learning process in the classroom, but also try to create some collective enthusiasm when discussing certain topics. In the end, we want to cover all the subjects that are typical for a half-year-long program of software engineering."

Vos estimates that about 40 quizzes will be required for each semester to cover all relevant topics. These contain well-thought-out theses that could serve as a catalyst for a healthy discussion of the subject. "Of course, the quizzes must be designed in such a way that they not only remain entertaining but also adequately serious and instructive. The quizzes will be provided with online and offline learning analytics for both teachers and students, so that they provide them with a good insight into learning patterns and processes that occur during the use of the quizzes. In this way I think they can be a valuable asset to software engineering education."

## Consortium

An expert international consortium of software engineering researchers, trainers and gaming experts will manage the IMPRESS project through an empirical approach. "All concepts and materials will be explored continuously and thoroughly and be refined if necessary," says Vos. "This way, the effectiveness will be evaluated and the content improved, while we'll also be able to make recommendations for further research into the products that are being used. All of the interactive gaming content we create within IMPRESS will soon be freely available to everyone as open source material. So that students and universities worldwide can benefit from it."

More information about the IMPRESS project can be found on the website [www.impress-project.eu](http://www.impress-project.eu).

More information about the software educational programs of the Open University can be found on the website <https://www.ou.nl/informatica-en-informatiekunde>.