Description of LEAP project submitted for publication to the SCIENTIX portal (16/12/2016)

Title (Acronym and Full Title)

LEAP: Lean and Agile Practices linking Engineering Higher Education to Industry

Teaser

Agile Design in Higher Education

Description of the project

Higher education prepares learners for their future role as professionals and active citizens in multiple ways: it builds field specific knowledge; it builds learning-to-learn capacity that empowers students to develop knowledge in life-long learning contexts throughout their careers in a constantly evolving job market; it prepares students to effectively transition from the educational environment into the professional world, to become effectively integrated into the professionally community, and to adapt to market-driven processes.

According to the Modernization Agenda for Higher Education, the sector faces multiple challenges in its quest to build critically thinking, creative, and adaptable adults (Vassiliou A.); these include the economic crisis, youth unemployment, integration of new technologies and modes of working, and more. On the other hand, the Communication on Opening-up Education highlights the need to stimulate innovative ways of teaching and learning through new technologies and digital content, to alleviate the "new digital divide" which has led to 50-80% of students never using digital content, and to exploit the opportunities of the digital revolution in educational contexts.

In engineering principles, the knowledge students build while enrolled in higher education may become to a large degree irrelevant a few years after graduation as a result of the fast evolution of technology in innovation related sectors. In this context, the capacity to think critically and to learn-to-learn are as important, if not more, as the base knowledge developed through formal curricula. In addition, to facilitate an effective transition to the professional world higher education must expose students to industry practices and processes rather than be limited to the development of core knowledge. This exposure may be achieved to a certain degree through specific courses; more effectively, it may be achieved through the integration of industry processes into curricula thus enabling students to use new skills and competencies in a learning environment that simulates the way industry deploys knowledge.

LEAP aims at building experience and knowledge among higher education students on emerging lean and agile industry practices empowering them to effectively transition into the professional world, focusing on engineering disciplines. The project further aims at closing the new digital divide by promoting the development of high quality digital content for higher education linked to both academic and industry needs. Lean practices encourage students to design solutions that meet needs while minimizing the deployment of resources. Agile practices expose students to industry cycles in which design is integrated throughout production processes, as opposed to only in the early stages of production, ensuring that the final product effectively addresses consumer needs.

Description of the research and reports of the project (information targeted to researchers)

LEAP pursues the objective of promoting experience building on agile design processes in higher education through the design and development of serious games that encourage learners to adopt industry roles, to think critically for addressing community and societal needs through agile engineering solutions, to practice on the application of industrial process management in the context of their higher education curricula, and to take into account environmental responsibility issues in service design and implementation.

The theoretical framework of the project is to be documented into a User Requirements and Methodologies report. The report will provide an overview of agile practices in industry in Europe as an analysis of how agile design is currently taught in higher education in Europe. This background will be the basis for the identification of learning requirements for higher education students towards building knowledge and experience on agile industrial design. Requirements will also be documented in the same report. The report will close with the definition of a high level design of the proposed serious game for promoting agile design thinking mindsets among higher education students.

The LEAP serious game will be validated in real-life contexts in classrooms in Greece, Portugal, Spain, Estonia, and the UK. The results of the evaluation process will be documented in a dedicated evaluation report that will provide insight on how and to what extent the proposed LEAP game-based learning framework contributes to the project objective of promoting agile design experience building in higher education.

Description of the activities and teaching materials of the project (information targeted to teachers)

Recognizing the importance of supporting educators on integrating the proposed innovative learning methods and tools into their teaching practices LEAP further develops good practice guidelines and instructor support content that facilitate the smooth integration of proposed game-based learning methodologies and related practical tools (serious game) in wider blended learning processes in higher education.

Specifically, the project develops learning sheets that describe end-to-end learning activities built on the LEAP serious game for agile skill development. The learning sheets may be used by educators as good practice recommendations on integrating activities on agile design into their teaching practices.

In addition, LEAP develops how-to videos that demonstrate the use of the LEAP serious game and its embedded learning scenarios. Videos of evaluation sessions are also planned to demonstrate how the LEAP game is used in practical learning experiments.