The pSKILLS Experience: Using Modern Educational Programming Languages to Revitalise Computer Science Teaching

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Abstract

Engaging learners has never been more challenging as ICT provides an ever-increasing array of hardware and applications designed to stimulate and motivate interest and absorption. Educationalists are faced with opportunities to select the platform and environment that address the needs of the lifelong learner, from student to administrator, that includes the curriculum moving from knowledge transmission to knowledge construction.

This paper presents the first tangible results by a two-years project (PSKILLS) aiming at enabling computer science teachers in secondary education to exploit modern educational programming languages. The project is set in the context of student-centered pedagogical settings, in order to contribute to making their courses effective, creative and attractive.

Several surveys at international level were conducted: to ascertain the current state of students and teachers training in computer sciences; to evaluate existing pedagogical approaches best suited to the computer science teaching; to identify, between available Educational Programming Languages, the most suitable one to be used for the training activities of the project.

On the basis of the identified training needs, a suggested common curriculum was created and recommendations for the adaptation of national computer science curricula were produced based on the use of the selected EPL, Scratch. The adapted curriculum would cover all core programming concepts with an intuitive user interface that can be easily understood by beginners to programming.

Training Scenario Templates focusing on the pedagogically-driven use of EPLs were conceived to provide training scenarios for teachers training to design, plan, and orchestrate learning activities that are intended to increase students' motivation and engagement. The templates are to be used with an array of tools including the Multimedia Open Learning Environment (MOLE), which is the learning support platform used for the establishment of the training infrastructure, managing courses, supporting learning processes and communities through the Web.