2017-1-ES01-KA203-038370

Section 3
Chapter 13 - Assessment in Videogames and Educational Apps Based Learning In Tertiary Education

Case Scenario 2

Title: **Online programming games as formative assessment tool**

Description:

Software engineering studies become more and more popular as the digital industry is growing. However, the field of programming is changing so fast, that universities are usually lagging behind not able to reflect the latest technologies. While teachers are preparing material, content and exercises to introduce new trends, they are already changed in the actual professional field.

However, there are plenty resources available online teaching programming spanning from fundamentals to challenging the concepts and unsolved problems within the field for more advanced professionals. Such environments like CodinGame, Tech.io, Codecademy, Khan Academy, Codewars and others provide lessons and exercises on more than 30 programming languages, have a built-in assessment algorithms and gamification elements, keeping student progress and adjusting the challenges based on one's performance. Moreover, these environments are initiated by the field experts, continuously learning professionals who bring the latest questions and solutions to others through the learning community.

The tools are mostly available for free and run on most of the latest browsers. One of the limitations that some universities have are that they purchase the software that limited to

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platform or one language narrowing the studies to that particular language or environment, because of the costly investments. However, most of the students do not purchase the environment on their own, which blocks the knowledge from being applied outside the classroom. The open browser platforms offer a sandbox for solving same problems in multiple languages allowing teachers to introduce any language and show the differences without investing in tools for all of them, and giving chance for students to practice on their own and apply knowledge for their own projects.

The successful implementation would require teacher engagement with the online tools and learning mindset to try new approaches. The tools could be incorporated into learning plan as practice an assessment method. Students can register for the platforms on their own and work within their profile, while teacher can put all students into a virtual group or follow every students and track their progress. Teacher chooses exercices from multiple difficulty and challenges available within the platform, and give for students ar part of the classroom activities, homework or assessment. When solving the problem students are given feedback about their mistakes and can improve the code multiple times. Some tools allow refactoring the code multiple times to improve the solution while saving all the previous versions. Teacher and other students can see each other solutions and collaborate virtually in real time, what is not possible when students are working on individual offline code editor. As the online learning platforms offer so many languages it is easy to apply the activities to almost any course in software engineering.

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