Agile project management approach for engineering education: eduScrum™ workshop

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Abstract

EduScrum is an active collaborative education process that create an opportunity for students to make assignments according to a fixed rhythm. They plan and determine their own activities keeping track of their progress. The teacher "determines" the assignments, acting mainly as a coach and adviser. The event presents a path from teacher-driven education to student-driven and organized education. The teacher determines the Why and the What, the students determine the How. During the workshop a parallel will be drawn between scrum, education and applications in engineering education. The starting principles are the autonomy and authenticity of people. In eduScrum approach, students have to take responsibility for their own learning paths and work together independently. During the workshop, activities will be conducted to guide participants on the methods for team building and conducting the various stages of eduScrum. The expectation is that when passing through a guided experience, the participant understands in practice the various stages of the method. The objective is that at the end of the workshop, participants will be interested in trying out this student-centered methodology and looking for the necessary development of competences to apply eduScrum with their students.

Keywords: eduScrum; Active Learning; Project-Based Learning; Agile Approach; Engineering Education.

1 Introduction

To Ferreira and Martins (2016), eduScrum is based in the Scrum framework, but especially tailored for the education environment. Groups can be formed by students or the teachers can form the groups. Before each sprint, stand-up ceremonies and project planning take place. Mahnic (2012) states that during a sprint, which is a period of work, the group has to develop or solve a set of tasks or user stories related to the course's objectives. It ends with a sprint review, where the sprint results are assessed. To Scott, Rodriguez, Soria and Campo (2015) a course can be composed of several sprints, so there is no need for longer sprints, which are quite ineffective. Figure 1 presents an overview of eduScrum.
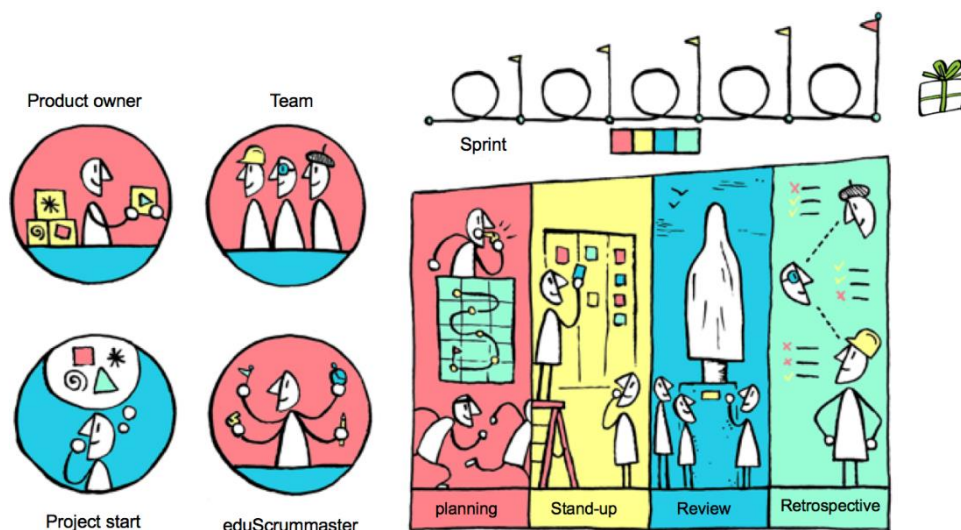

Figure 1 - Roles, sprints and ceremonies of eduScrum

For Dinis-Carvalho *et al.* (2017), an application of scrum with a pedagogical layer was proposed in 2013. Willy Wijnands is the initiator and founder of eduscrum and a chemistry/physics teacher on the Ashram College in Netherlands. Eduscrum uses the cerimonies, roles and tools of scrum.

With eduScrum, students work together in an energetic, targeted, effective and efficient way. eduScrum students are stimulated to develop into a valuable member of a team and ascertains a mindset that aims for constant improvement. This way of working generates pleasure, ownership, autonomy and responsibility, the work is faster and the results are better. In addition, students pass through a positive personal development and develop creativity, collaboration, communication and critical thinking (4Cs). A ground-breaking way of education, where personalized learning has a very important role.

2   Learning objectives

In this workshop, participants will:

•   Discuss why the education must change.

•   Get an explanation of the eduScrum process and the Why.

•   Learn how to build teams and create an eduScrum approach.

•   Pass through a guided experience in the eduScrum process hands-on.

•   Reflect after working on a eduScrum case.

3   Activities

During the workshop, activities will be conducted to guide participants on the methods for team building and conducting the various stages of eduScrum. The activities will focus on the development of eduScrum planning. In this way, the construction of the product backlog, the definition of learning objectives from stories, time estimation, grouping of activities in sprints, the use of artifacts (flipboard and burndown chart) and script of the ceremonies will play a central role throughout the work.

Throughout the workshop, it is hoped to qualify the participants in the teaching competencies identified as priorities for eduScrum. Activities will be developed in 4 specific dimensions: eduScrum body of knowledge, lesson planning, class execution and writing of supporting texts.

The first dimension concerns the study and understanding of the philosophy behind the eduScrum and the guides and manuals developed by its proposer Willy Wijnands.

The second dimension involves applying the correct division of roles experienced by students and teachers, transforming learning objectives into user stories, and prioritizing planning, time and resources of instructional activities.

The third dimension encompasses efficient classroom workflow with the use of features such as the flipboard and the burndown graph. It also covers the grouping of activities in sprints and the management of deliveries and deadlines.

The last dimension concerns the transformation of class notes into self-instructional texts that allow the advancement of teams without the constant intervention of the teacher and thus give greater autonomy to eduScrum teams.

4   Expected results

It is expected at the end of the workshop that participants will be interested in trying out this student-centered methodology and looking for the necessary training to successfully lead eduScrum. The teachers involved in the event will form their own opinions on the usefulness of this approach with their own students.

5   Acknowledgements

6   References

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