

Using Distributed Scrum for Supporting Online Collaborative Learning - A Qualitative Descriptive Study of Students Perceptions

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Abstract

One purpose of higher education is to prepare students for a modern and ever-changing global society with increasing complexity and collaborative environments. Scrum is a widely used framework for project management dealing with development of complex products. Few studies have been made on the use of Scrum in higher education. This study examines to what extent distributed Scrum can support online collaborative learning, more exactly what are the advantages and drawbacks on distributed Scrum from a student perspective. Twenty students in an online course has participated in Scrum projects as members in distributed teams. Student's perceptions was captured using semi-structured interviews. The preliminary results indicate that students are satisfied with Scrum and that they experience a high degree of flexibility. The transparency in Scrum is perceived as a key to open communication and effective collaboration.

Keywords: e-learning, online education, Scrum, distributed, collaboration, transparency

1 Introduction

Online education is an increasing trend in higher education (Allen, Seeman, 2014). The evolution of ICT has a great impact on society in the way people live, work, learn, communicate etc. Access to information is no longer a problem. "People expect to be able to work, learn, and study whenever and wherever they want." (Johnson et al, 2011). Formal learning within higher education aims to prepare students for a modern, ever changing society and to give them the necessary tools to adapt to the changes (Ryan et al, 1996). The student of today need skills such as identifying and solving problems, collaborate, communicate, interact, find and use information. This makes it important that students learn how to learn. One way to prepare students is to let them collaborate with real-world problems in real-world-similar contexts. Collaboration has also been shown to decrease dropouts and increase retention. Other aspects of collaboration in education is that students must learn how to work in teams (Snyder, 2009) and students can have a negative attitude against teamwork (Pope-Ruark, 2012).

Scrum is a successful framework for managing projects dealing with development of complex products widely used in software development (Schwaber & Beedle,

2002). The Scrum process is goal driven, iterative and incremental and self-organizing teams collaborates to reach the goals (reference). The software industry is also affected by the globalization which implicates that distributed development has an increasing trend (Shrivastava & Date, 2010). Communication, interaction and collaboration becomes a challenge when people are geographically spread. Collaborative learning in an online setting meets the same challenges as distributed development.

Similarities between online collaborative learning and distributed software development lead us to this question. Can distributed Scrum be used to support online collaborative learning? The research question this study aims to answer is to what extent distributed Scrum can support online collaborative learning from a student perspective, more exactly what are student's perceptions regarding the benefits and drawbacks of collaborating in a distributed Scrum team in an online course.

2 Theoretical background

This section introduces Scrum and ends with an overview of how Scrum has been used and studied in a higher education context.

2.1 Scrum

Scrum is the most popular of the Agile methods (Rubin, 2012). "Agile is a set of methods and methodologies that help your team to think more effectively, work more efficiently, and make better decisions" (Stellman & Greene, 2014). Agile is also a way of thinking, a thinking that promotes open communication, transparency and visibility. A key factor to build agile teams is to establish the agile mindset within every team member (Stellman & Greene, 2014). Scrum is a framework for managing projects that deals with development of complex products (Schwaber & Beedle, 2002). It was originally developed to solve problems with software development, but Scrum is not limited to software development. The framework is also used in other areas such as business, industry and military. Scrum is based on an empirical process control model which means that evidence comes from observations and control is achieved through transparency, inspection and adaptation (Schwaber & Beedle, 2002). The Scrum process is incremental, iterative and goal driven. The process is divided into several iterations, or sprints, and every sprint has its own goal, and focus is on the current sprint. The length of a sprint is between 1-4 weeks. Each sprint starts with a planning meeting which aims to set up a goal for the sprint to come (Schwaber & Beedle, 2002). Each day normally starts with a short meeting time boxed to 15 minutes, the daily scrum. The purpose of these meetings is to make the progress visible and to build trust and team spirit. It also gives an opportunity to make necessary adjustments in the process. Every sprint ends with two meetings. The sprint review meeting where the team demonstrates and delivers the increment and the retrospective meeting where the team inspect their work and make changes for continuous improvement. A case study concluded an increase in customer satisfaction

and more satisfied developers and less over time after introduction of Scrum (Mann & Maurer, 2005). Limitations on Scrum is that it developed for small teams, three to nine developers which also makes it more suitable for smaller projects (Ionel, 2008). Critical success factors are engaged and motivated team members (Chow & Cao, 2008) and close cooperation with an engaged customer.

Scrum in higher education

Scrum should be regarded as a framework for project management, rather than merely a software development method. Scrum is also used in other contexts. There has been some research on using Scrum in higher education and very few of them in an online education context. Most of these are studies on courses regarding software development. There is also some research on using other agile methods than Scrum in higher education. Ovesen (2013) concludes after some experiments with the use of Scrum in problem-based learning projects in Industrial Design that Scrum improves focus and team efficiency. Those experiments were conducted with students at campus. Pope-Ruark (2012) explores Scrum used in Web-software development projects. She discusses how Scrum can be adapted and to create successful projects. Mahnic (2012) uses Scrum in a capstone course on agile software development and states that students were overwhelmingly positive and confirms the reported benefits of Scrum. Sharff et al. (2012) report from a project on the difficulties for students to adhere to scrum on global software projects. Damian et al. (2012) describe initial challenges encountered when applying distributed Scrum practices on a globally distributed project. In another study Paasivaara et al. (2013) conclude that Scrum supports collaboration, supports learning of important global software engineering skills such as distributed communication, teamwork, building and maintaining trust, using appropriate tools and intercultural collaboration.

3 Method

3.1 The Case

‘Distributed Software Development’ is a course in the fourth semester in a bachelor programme named ‘Informatics with Focus on Systems Development’. Twenty students have taken this five-week course during spring 2015. The course as well as the programme is fully online. The purpose of the course is to give students an understanding of technical and social challenges related to distributed software development and knowledge how to handle those challenges. The first week of the course students were introduced to web based collaborative tools and processes and the last four weeks they participated in a practical software development project.

Tools that the students were introduced to were Visual Studio Online (VSO) to manage work and tasks in the project. The students were shown how to use the Scrum template in VSO to manage the project. Visual Studio has integrated support for GIT for versioning control and code sharing and the central repository was hosted within

VSO. HipChat was introduced to handle group communication within the team. It's a group chat tool with support for notifications related to events in VSO. For example when a new task is created or when some source code is pushed to the central repository. They were also introduced to myBalsamiq which is a collaborative tool for prototyping and RealtimeBoard which can be used to create mind maps and prototypes. PlanningPoker is another collaborative tool that were introduced to support the process of planning poker for estimating complexity in work items.

Students were allocated into four equally sized groups based on information gathered at the start of the course where they estimated their own abilities regarding programming knowledge, social ability, design skills etc. Four teachers were involved in the projects. One teacher was having the role as a product owner for all four projects. The other three teachers had the roles of Scrum master's. One teacher was Scrum master for two teams and two teachers were Scrum masters for one team each. The Scrum projects were divided into three sprints, six working days each. Each sprint started with a sprint planning meeting, followed by a sprint review and a sprint retrospective. Since the time and resources were limited some meetings occurred within the same meeting. Between the first and second sprints, and between the second and third sprint the first part of the meeting was sprint review followed by a sprint retrospective and ended with a sprint planning meeting.

The five students in each group formed the Scrum developer team and they were responsible for organizing themselves. It was the team's decision to choose which tools they were going to use for communication, document sharing, screen sharing etc. The first task was to form a contract and come to an agreement about communication, documentation, meetings, tools etc. Some things were determined by the teachers. They students had to use Scrum, VSO using the Scrum template and GIT for managing the work, code sharing and versioning management.

3.2 Sampling and Data Collection

The data conducted for this study consists of semi-structured interviews with ten students conducted within three weeks after the end of the course to gather their perceptions of Scrum as participants in distributed teams. Purposeful sampling with maximum variation were used to gather as much information as possible (Creswell, 2002, Sandelowski, 2000). Variations in sex, age, work, time zone and family situation were considered during the sampling process.

The interviews were conducted via Skype and recorded with MP3 Skype Recorder. The recordings were then transcribed for further analysis.

3.3 Analysis

Data was analyzed using qualitative content analysis. It is a common used method in qualitative descriptive research designs (Sandelowski, 2000). Qualitative content analysis is not only interested in the manifest of data, but also the latent data, the underlying meaning of the text.

4 Preliminary results

To be continued ...

5 Preliminary discussion

To be continued ...

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