

CHAPTER 6

EduScrum in Teaching Lessons

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INTRODUCTION

The world of work is undergoing fundamental change due to globalisation and digitalisation. Hardly any sector is spared: services and products as well as production and work processes are affected, as are the associated company structures.

It follows that teaching and learning must also change in order to meet the changing demands of the working world of present and future society. Students often lack personal competences and skills that are becoming increasingly important in the world of work against the background of the digital transformation: Cooperation skills, communication skills, planning and organisational skills and the ability to regulate learning processes independently (Gerholz & Dormann 2017). These skills, which are not only necessary for professional activities, are often only developed after leaving school.

A particularly interesting and promising didactic approach is based on the use of agile methods, which originally come from the IT industry and software development and are also already being applied in the school education context. For example, at the American School in Switzerland (Cosgrove, Magnuson, Tihen & Patton 2019) or at Ashram College in the Netherlands (Stolze & Wijnands 2019). Willy Wijnands teaches at Ashram College and is co-founder of the worldwide initiative “Agile in Education” as well as initiator and founder of eduScrum.

EduScrum is totally free and on the website “eduscrum.org”, the eduScrum Guide is available for download in numerous languages. You can register for monthly eduScrum Newsletter and it is possible to join one of our monthly World Journey Sessions.

EduScrum is a very comprehensive method that draws its foundations from the Scrum process model. Scrum has been successfully used for years as an agile project management tool in software development, among other areas. It represents a process model for the development of multi-layered software products and has a high status within the IT industry. The Scrum framework combines principles of agile principles. These include transparency, recurring review, and

adaptation of the procedure. The approach of integrating Scrum in the education sector is relatively new and only little researched. This chapter presents eduScrum as a didactic concept which can be used both in the context of teacher training at universities and in schools within project-oriented lessons. Due to the fundamental process-open design combined with a firmly defined procedure, analytical, creative, and critical skills are particularly promoted among the students.

THEORETICAL BACKGROUND

EduScrum is based on the idea of the agile mindset. Agility is not a buzzword, but an attitude, an idea, and a guideline to be able to cope with the growing complexity in actions. Agile collaboration is understood as a countermovement to the “top-down” organisational processes that are seen as bureaucratic.

Behind the concept of agile education lies a value system whose essential contents are represented by the Agile in Education Compass (Delhij et. al. 2016) (Figure 1).

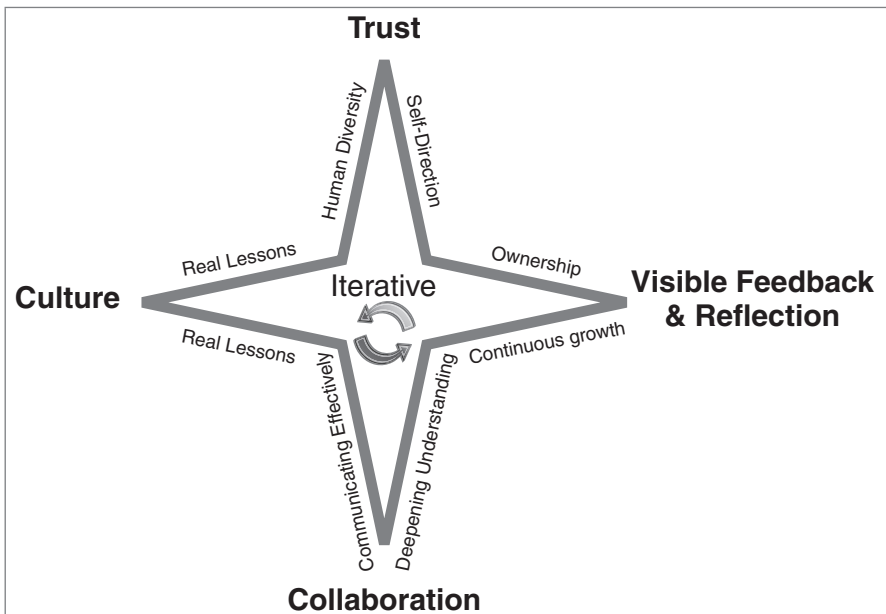


Figure 1 - Agile in Education Compass (Delhij et al. 2016)

The Agile in Education Compass represents a value system based on trust, feedback and reflection, education, and collaboration. These values are seen in an iterative process and in their totality reflect the understanding of the term ‘Agile Education’.

Scrum is a process model. It is intended to break up the rigid, sequentially built-up procedure and redefine project work through iterative as well as incremental elements. The abbreviation “edu” stands for “education” and extends the Scrum framework to include integration in education. The essential components are taken from Scrum and adapted for use in education. Analogous to the Scrum Guide, in which processes, roles, artefacts and principles are defined, there is the eduScrum Guide (eduscrum Team 2020). The transparent processes make it possible to constantly review and adapt processes (e.g., learning successes, personal development). The focus is on the individual responsibility of each person and thus of the team. The approach and the underlying processes are determined to a large extent by the students. Teachers act as learning guides and determine the guidelines with regard to the topic and the assessment of the resulting products (successful implementation of the project). An advantage of (edu)Scrum is that there are only a few roles, rules and structural elements. This means that it can be learned and implemented quickly.

Working with eduScrum can also be justified in terms of educational theory with the help of Deci and Ryan’s (2000) self-determination theory. The self-determination theory postulates three innate psychological needs that are equally relevant for intrinsic and extrinsic motivation and are particularly promoted in the implementation of eduScrum:

Need for competence or efficacy, autonomy or self-determination and social relatedness or affiliation.

LITERATURE REVIEW

The methodological concept of EduScrum originated in the Netherlands and is now being integrated by committed teachers into various educational sectors worldwide. On the website “eduscrum.org”, the eduScrum Guide is available for download in numerous languages. The guide describes in detail the different steps in implementing eduScrum in educational programs (eduScrum Team 2020). Only in the last few years has eduScrum gained worldwide attention.

Most currently published articles on eduScrum deal with the didactic-methodical implementation of the concept in teaching situations. The special conditions of distance teaching during the pandemic are also frequently included (Reichwein & Stiehm 2022; Voštinár 2021). Some of the publications explicitly refer to the implementation of eduScrum in the field of higher education (e. g. Filho & Lima 2018; Ryazanova, Naumov & Kamennykh 2020; Kuz 2021). Other publications focus on primary and secondary education (e. g. Semenovskikh & Volkodav 2021; Voštinár 2021). However, it is noticeable that so far only a few articles explicitly deal with the effectiveness of eduScrum in learning processes. The results of the empirical research contributions apparently shows that the use of eduScrum improves competence development compared to other teaching concepts (Lazorenko & Krasnenko 2020; Sturm & Rundnagel 2021).

Positive results were particularly evident in the competence areas of communication, creativity, independence, and problem-solving. For the future, further studies on the effectiveness of eduScrum in teaching/learning processes are necessary to be able to comprehensively assess the quality of this new project management method when used in educational institutions.

EXPLANATION OF THE TOOL

■ Aim of the tool

The aim of the tool is to promote self-organised learning and action to improve critical, analytical, and creative skills of the students.

■ Expected outcome

EduScrum is a project-management method for education. It is very useful for project-based learning where the students have to solve complex task in a structure manner without a teacher give a direct information what they have to do. The outcome is the result of a problem-solving process which has to be solved in a autonomously working team of four to six students.

■ Allocated time

From two days up to two weeks and more.

■ Setting, place layout

This method can be implemented in a common classroom setting or in an online setting. It is necessary to have space for the scrum board unless the group is going to use an equivalent digital tool.

■ Necessary materials

If you are using a physically scrum board, you need some Moderation cards and pens. You can also use a digital board e. g. a KanBan board. The other materials depends of what kind of content your project has.

■ Number of participants

Each group of students consist of four to six students. The number of groups are not limited, but it is for the organization better not to have more groups than four or five.

■ Role of students

One role of students is to be a team member of the student-team. The team itself works autonomous, self-organized and interdisciplinary.

Another important position within the team is the eduScrum-Master or Team captain: The eduScrum Master (eSM) is the member of the student-team. The eSM ensures that the team can act in the best possible way. To do this, he moderates the individual phases and deadlines. The eduScrum-Master engages on the same level as the other team members.

In the starting period of an eduScrum learning circle it could be a good choice that the teacher works very closely with the eduScrum Master together or he is overtaken some task of his job.

■ Role of teacher

The role of the Product Owner (PO) is taken by the teacher, and he is not part of the student-team. The PO defines what is to be learned. For this purpose, details such as learning objectives, celebration criteria, learning materials, time, etc. are defined before the work starts. Celebration Criteria are requirements that the tasks or projects must meet for successful completion.

■ Steps to use the tool

In Figure 2 you see the entire learning and working cycle of eduScrum.

On the left of the side, you could see the planning section. After the start it's turning a subject into a project. The teacher determines what and why to learn. To monitor the quality of what has been learned, the teacher uses a number of Celebration Criteria that are established in advance and shared with the student team. These Celebration Criteria consist of, for example, requirements for the tests, forms of presentation and their scope, rubrics, but also deadlines and other preconditions for the work to be delivered. The team is responsible for ensuring that the Celebration Criteria are met.

Then it is necessary to form the Student Team with the Team captain. Friendships are not important. The next step is the planning section. On a board, we call it scrum board, the team develop an overview of all tasks of the project.

In the middle you can see the working cycle. The student team are working self-organized and interdisciplinary on their project. During the working cycle stand ups were carried out. Stand ups are short reflection on the development steps to achieve the goal. It helps the student team to synchronize activities and plan for the next meeting.

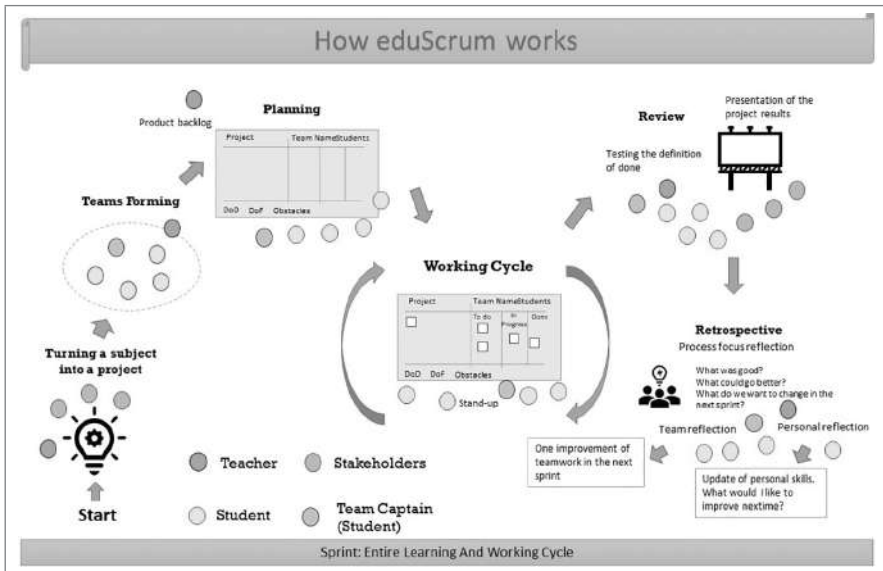


Figure 2 - How eduScrum works? (<https://www.eduscrum.nl/resources>)

After one working cycle the review-process will begin. The student Team demonstrates the project results, and the teacher compares this with the learning objectives. The form depends on the learning objective (s) and Celebration Criteria. During the entire sprint it is important to review and adjustment as often as possible, but not too often.

Finally, the retrospective is the moment for the student team where they look back on their delivered work and their personal and team development. The retrospective must be carried out with sufficient depth so that the team as well as the individual members can use it to draw up a plan to improve themselves during the next sprint.

Important elements, which will be described in more detail below:

Sprint: Main component of eduScrum. In a sprint, certain work steps are carried out in order for students to work on a project, subject, etc. independently.

Scrum-Board: An overview of all tasks that are required to achieve the learning goal.

Stand-Up: Short reflection on the development of work steps to achieve the goal.

Review: The teams show what they have implemented in the last sprint. The product owner compares this with the learning objectives.

Retrospective: Evaluation at the end of the sprint.

■ Assessment

In addition to determining what is being learned, the teacher will also have to monitor, test and improve the quality of the learning outcomes. For this he has Celebration Criteria at his disposal, which are the requirements or criteria the assignments or projects must meet. The Celebration Criteria that are established in advance and shared with the student team. They are clearly visible on the scrum-board. The team members set up tasks and activities themselves to ensure that the Celebration Criteria can be met. In addition, the students can also add their own Celebration Criteria to their own project and / or product in consultation with the teacher.

■ Students' feedback

Based on my experience by using this method this is a very new and challenging approach for many students, a longer introductory period is essential for a sustainable and successful implementation. The need to experience competence through the ability to act and positive effort is perceived as activating by the learners in the area of problem-solving in a team using their own skills. The students complete the self-imposed tasks on their own, can reflect on and optimise their approach in a goal-oriented way. It is noticeable that a lot of time is needed to understand the procedure and the individual phases in eduScrum. How to learn with eduScrum needs to be exercised. In the beginning, simulations such as the airplane game (Hermens 2016) or the ball point game could be carried out with the students.

EXAMPLE

This short example is intended to illustrate the use of eduScrum. The school class consists of 34 students between the ages of 16 and 22 who are undergoing vocational training to become IT specialists. The students first receive the eduScrum project goal and the acceptance criteria from the teacher. The project goal was: Create a **concept paper** for an educational video on the topic of electrical power and electrical work. The acceptance criteria were:

- Running time: 2 to 3 minutes, max. 5 minutes,
- Target group: IT specialists,
- Type of learning video: free (screencast, laying technique, interviews, ...),
- present a practical example in a way that is comprehensible to the target group,

- no in-depth physical formulas,
- Content and structure important, design and aesthetics secondary.

In the implementation, the teams were autonomous, individual, and self-directed. The learning goal was to be achieved in the form of a sprint divided into two sprints. Seven people from the class were chosen for the team formation, who were to put together an interdisciplinary team on the basis of the completed slips of paper (“What am I particularly good at?”). The students went through the planning, editing, stand-up, review, and retrospective phases twice and documented the process on their respective boards. Care was taken within the teams to ensure that tasks were distributed appropriately throughout the sprint and that time was kept to. Learning objective(s) and acceptance criteria defined the sprint goal.

After the sprint was completed, the teams were asked about the current status of the learning objective and the acceptance criteria. The Product Owner had to ensure that each team achieved the learning objective and the acceptance criteria. Finally, an outlook on the implementation of the learning videos was made. The creation of the videos took place in the following lessons. The teaching day ended with a detailed feedback session.

CONCLUSION

EduScrum is a framework model that gives the students orientation and a fixed structure. Within this structure, however, the students have a lot of freedom to work on their individual learning tasks. In this way, the students achieve a clear gain in competence in the areas of self-organization and problem-solving. Furthermore, eduScrum strengthens the ability of the students to take responsibility and guides them to plan the learning process by themselves. The teacher determines WHAT and WHY to learn, the students decide how to learn. During the sprint analytical thinking and problem-solving learning are particularly supported.

Based on the fixed and regulated processes and assignments, eduScrum offers an ideal setup in order not to lose contact with the class students even during the Lockdown, and to accompany and reflect on their “learning progress”.

It is particularly important that the students are not completely left to their own devices and have a lively exchange with each other and with the teachers. Especially against the background of a heterogeneous learning group, central synergy effects of the individual learners are of enormous importance. These regular meetings are a clear advantage of eduScrum, as the respective team members are in close exchange with each other through the meetings and thus problem areas become visible more quickly. In “classic project work”, these problems often only become apparent when it is too late (shortly before the project is handed in).

Many of the students found it difficult to identify needs (professional inputs) and to communicate them to the teachers. Furthermore, it has been noticed that some learners are still strongly bound to the “classical” role of teachers. This means that it is difficult for them to take responsibility for the learning process. At some points it became apparent that learners have internalised the attitude “I learn what the teacher tells me and how she tells me” and find it difficult to dissolve this. eduScrum offers some possibilities to support the necessary “change of mind”.

Based on our experience by using this method this is a quite new and challenging approach for many students, a longer introductory period is essential for a sustainable and fruitful implementation.

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