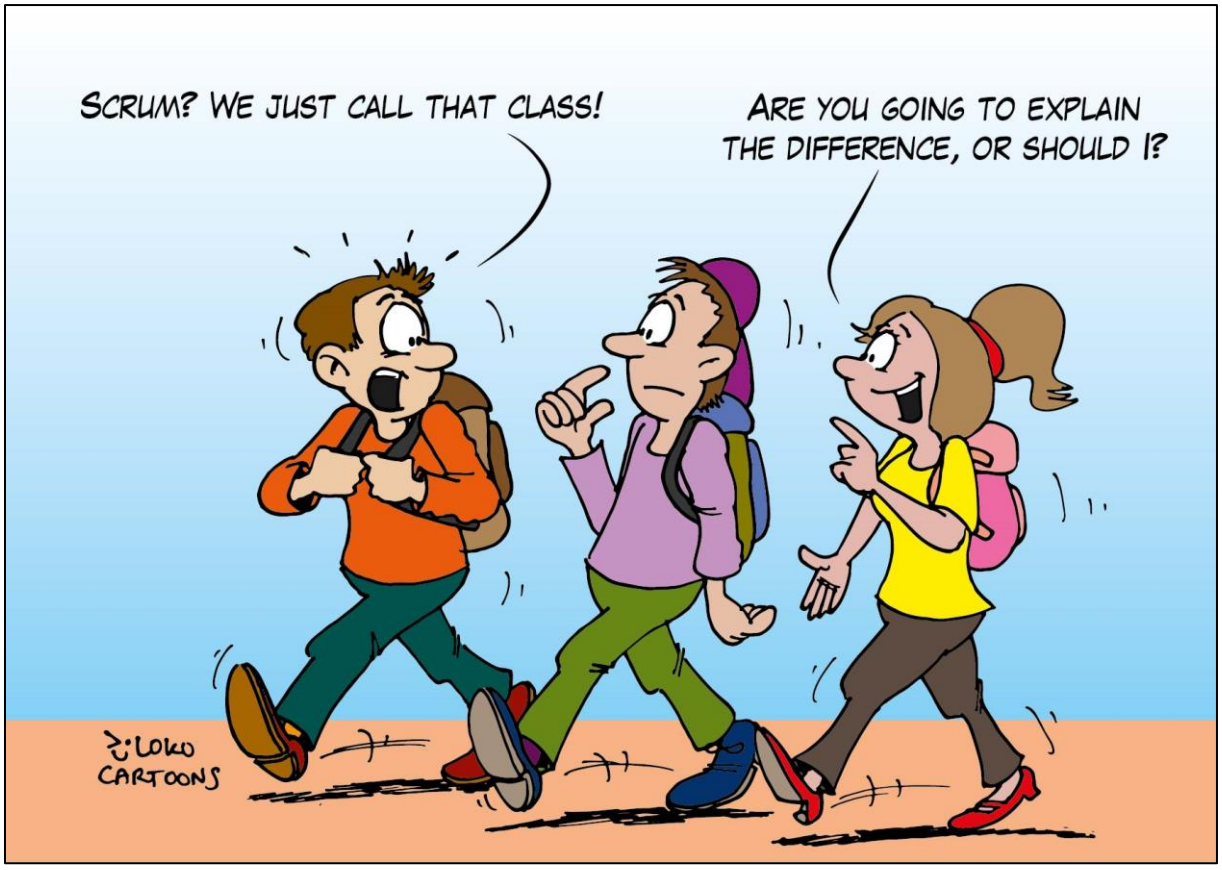
Scrum@school Guide

Scrum@school in the classroom - the rules of the game



January 2019 - Ellen Reehorst, Jan van Rossum, Susan Saris

Content

1. Purpose of this Guide

Scrum@school is a comprehensive didactic framework that can be used for all ages from 12 years and up, and on all educational levels. Scrum@school can be employed for classes, projects and actual assignments.

Scrum@school was developed by Jan van Rossum, Ellen Reehorst and Susan Saris. In this Guide, they will describe Scrum@school as the clear didactic framework it is, and to keep the method pure.

2. Definition of Scrum@school

Scrum@school is a didactic framework for collaborative learning, that will naturally and integrally result in effective collaboration, in-depth learning, personal development and an improvement-oriented mindset (Kaizen).

Scrum@school is a lightweight method that's simple to understand, but difficult to apply.

The framework consists of roles, values, ceremonies and instruments, plus the rules that connect these elements. Each element in the framework has an important function and is essential for success.

In addition to the subjects that are taught, Scrum@school also focuses on the way this is done. In addition to the results, it also focuses on the process that led to them. In addition to individual performances, it also focuses on the performances of the Team and Team Members. And in addition to substantive learning, it also focuses on the development of the student as a person.

Scrum@school turns learning and development into an incremental process and it stimulates students and teachers to become allies on the same journey of learning.

3. Scrum at the foundation of Scrum@school

Scrum@school is based on the Scrum method as described in the Scrum Guide (Jeff Sutherland & Ken Schwaber, 2017). Because Scrum is a powerful, comprehensive and thoroughly tested framework, Scrum@school stays as close to it as possible.

Scrum is a framework for developing, producing and maintaining complex products. The multidisciplinary Scrum Teams work in short Sprints and in an agile process towards products that will add as much value as possible for the client. To do so, the Teams will present intermediate results after each short Sprint to get feedback from the client, stakeholders and users. These feedback loops result in an ongoing process of progress. Both the Teams and the client gain more and more knowledge, and the product can be improved using progressive insights and unavoidable changes.

Scrum was originally developed for IT purposes and is now used in many other fields (communication, marketing, HR, media, technology, etc.). It results in faster processes, better products and greater job satisfaction.

4. Adjustments and differences compared to Scrum

Scrum focuses on developing, delivering and maintaining complex products. In Scrum@school the focus is not on products, but on learning. Therefore, some adjustments were made:

- **Team formation Ceremony**

Teams are formed based on complementary qualities, so Team members will learn from each other.

- **Definition of Fun**

Teams decide for themselves what is needed to pleasantly work together.

- **Sprint Review split**

The Sprint Review is split into two steps: Sprint Release (delivery plus collecting feedback) and Sprint Review (analysing feedback and identifying areas for improvement). This way, analysis and improvement are given explicit attention, which is essential for education.

- **Teacher in a dual role**

As the *Super Scrum Master*, the teacher is responsible for the quality of the Scrum process within the Teams, and for supporting the Scrum Masters. As the *Product Owner*, the teacher is responsible for *what* students learn (relevance and content of the assignment and quality of the feedback). The teacher must also teach the students *how* to learn best. So as a *Product Owner*, the teacher is not only responsible for *what* is learned, but also partly for *how* it's learned.

- **Growing autonomy of the Teams**

The responsibility of the Teams for *how* they work and *how* they learn will increase during the process. As soon as the Teams start working on their own learning goals or self-aquired assignments, they will also take over part of the responsibility for *what* they do. Thus, the teacher will gradually and consciously take a step back in both roles. The learning process shifts from teacher-driven to self-organised.

- **From push to pull**

In the first instance, the teacher will determine the results for the Teams per Sprint (*push*). As the Teams start to take on more and more responsibility, they will determine achievable results per Sprint themselves (*pull*).

- **New Teams**

New Teams are formed at least twice a year. This way, students will learn how to collaborate with different people.

5. Foundation of Scrum@school

Scrum@school is a practical interpretation of the following important educational theories:

• **social constructivism** (Bruner, Piaget), **collaborative learning** (including Ebbens & Ettekoven)
Learning is seen as a social and active process, in which knowledge is constructed by the learners and the way they collaborate. The learners work together in groups to find answers: aspects like learning from each other and being able to reflect on what is taught are very important. This is the way the self-organising Scrum@school Teams learn and Scrum's empirical method fits in seamlessly. The pillars of Scrum – transparency and short cycles of reflection and improvement – support and reinforce the learning process.

• **self-determination theory** (Deci & Ryan, Stevens)
This theory connects the basic psychological needs for autonomy, competence and solidarity with the development of intrinsic motivation. These basic needs are all met in Scrum@school.

• **growth mindset** (Dweck)
A growth mindset provides having confidence in one's own abilities and contributes to the realisation that exercise will help you grow and that making mistakes is part of the learning process. A growth mindset can be taught and it contributes to motivation, learning performance, perseverance and creativity. Scrum@school expands this to a Kaizen and Agile mindset, with Kaizen representing 'improving in small steps' and Agile representing maneuverability.

• **effect-size** (Hattie)
The meta-study by Hattie (Visible Learning 2009) shows that all Scrum@school Ceremonies have a high effect size (> 0.45) and contribute strongly to effective education.

6. Values within a Team

In a Scrum@school Team, *helping each other*, *learning from each other* and *improving in small steps* are important values. When a Team respects these values, the Team members will learn to trust in each other and gain a healthy dose of self-confidence. Both aspects result in greater learning benefits.

Scrum@school has also adopted the five Scrum values: *commitment, focus, openness, respect and courage*. In a successful Scrum Team, each Team member works with *commitment* and *focu*s on the common goals. Team members are *open* about their work, the working method and towards each other and they show *respect*. They also have the *courage* to do the right things and to tackle problems.

7. Roles within Scrum@school

• Scrum Team (Team)
A Scrum Team consists of students who join forces to carry out an assignment that adds value to their learning process. This allows them to achieve relevant learning goals like working together, in-depth learning, personal development and a Kaizen / Agile mindset.
A Team is formed during a Team formation Ceremony and consists of students with complementary qualities.

A Team is small enough to be able to conveniently work together and big enough to learn sufficiently from each other. A Team preferably consists of four students; three is preferred over five. Less than three reduces the opportunity to learn from others; five or more makes effective collaboration difficult.

A Team works as self-organising as possible and learns to deal with growing autonomy. Within a Team there are no sub-Teams, positions or specific responsibilities. The only exception is the Scrum Master. The Team as a whole is responsible for the task and for every member's learning process.

• Scrum Master
The Scrum Master helps the team to scrum well. Besides being a cooperative Team member, the Scrum Master is a serving leader with a few extra tasks. These tasks are: to initiate, facilitate en monitor Scrum Ceremonies, to identify and help solve problems, and to maintain the connection between Team and teacher. Scrum Masters are chosen during the Team formation Ceremony. As many students as possible will be given the opportunity to fulfil this role.

• Super Scrum Master
The teacher functions as Super Scrum Master and is responsible for the quality of Scrum within the Teams. The Super Scrum Master also supports the Scrum Masters and solves obstructions that lie outside the power of the Teams. The teacher takes on the role of a serving leader for all Scrum Teams in a class or group, and gradually lets the Scrum Masters take more and more responsibility.

• Product Owner
As the Product Owner, the teacher is responsible for *what* the students learn: the relevance and content of the assignment, the quality of the feedback and the quality of the learning process. The teacher should also teach students *how* to learn in the best way possible. So as a Product Owner, the teacher is not only responsible for *what* is learned, but also partly for *how* it's learned.

Learning strategies, working together properly and dealing with gradually increasing autonomy are all part of the learning process; the Teams will become more and more self-organising as in *how* they work. As soon as Teams start working on their own learning goals or self-aquired assignments, they also start sharing in the responsibility for their own learning and thus for *what* is learned. However, the final responsibility for the *what* and *how* of the learning process still lies with the teacher as the Product Owner, who will monitor the quality of the curriculum.

8. The Sprint at the heart of Scrum@school

At the heart of Scrum@school is the Sprint: a short period of time in which the Teams deliver products that contribute to the final goal of the assignment and that add value to their learning process. Teams work in multiple Sprints towards the final goal of the assignment (a certain series of lessons, a module or project).

Each Sprint can be considered as a mini-project, with a short and overseeable time line. Therefore, each Sprint has a clear sub-target that contributes to the final goal and will result in one or more valuable products (or evidence) that contribute to the final delivery.

• number
An assignment consists of at least 3 Sprints, but preferably more, so that the team can repeatedly reflect and adapt.

• length
In practice, a complete assignment usually takes 9 or 10 weeks.
Within an assignment, all Sprints have fixed and equal lengths, to give the assignment a rhytm and a certain flow. A Sprint takes 4 working hours at minimum, and no longer than 2 weeks (when counting only a few working hours per week). If a Team would work fulltime on an assignment, a Sprint would take a maximum of one week.

• content
Each Sprint consists of the following fixed steps, called Ceremonies:
- Sprint Planning
- Stand-ups (and working, learning)
- Sprint Release
- Sprint Review
- Sprint Retro(spective)

A new Sprint starts immediately after the end of the previous one, until the final goal of the assignment is reached.

• advantages
The short Sprints make Scrum@school a short-cycle didactic (iterative). This has the following advantages:
- short time lines are easy to oversee, make planning easier and prevent postponement
- working towards smaller results on a regular basis reduces peak load and stress
- being monitored and corrected on a regular basis results in better (learning) results
- rhythm, structure and predictability provide grip and a counterbalance to the growing autonomy
- the risks of self-organised learning are limited by the short length of the Sprints

9. Ceremonies of Scrum@school

Scrum@school consists of a number of fixed steps called Ceremonies. This term indicates that every step is equally important and deserves serious attention. Cutting out the Ceremonies would reduce the transparency and learning benefits of Scrum@school.

One-off Ceremonies at the start of the assignment

• Team formation
During this Ceremony, students form Teams that contain as many complementary qualities as possible.
This Ceremony takes up a maximum of one hour and consists of three steps:
1. expressing qualities
2. nominating Scrum Masters
3. choosing Teams

The Ceremony for Team formation strengthens the self-confidence of the students and results in Teams with a suprising composition. Students will discover that they can work together with people they don't know yet, and Team members can learn a lot from each other's qualities. It also prevents Teams consisting of friends, as this usually complicates cooperation.

As Super Scrum Master, the teacher leads the Team formation Ceremony. The teacher is responsible for the procedure and for creating a safe, respectful atmosphere. The teacher can make additional demands regarding the composition of the Teams (e.g. even distribution of boys and girls).

While working on an assignment, a Team stays together and the Scrum Master remains in function, unless the Team and the teacher, by exception, decide that there are compelling reasons to deviate from this. It's the teacher who decides when new Teams are formed. This is done at least twice a year, so students will learn how to work together with different people.

• Release Planning
This one-off ceremony is only performed at the start of the assignment. The duration varies from 10 to 30 minutes. As the Product Owner, the teacher will explain the assignment. The following aspects are discussed: end goal, delivery, learning objectives, interests, final assessment, division into Sprints, Product Backlog. In case there are actual clients, they will contribute to this explanation.

The Release Planning provides the Teams with a vision, inspiration and a clear framework.
The Product Owner is responsible for a clear explanation of the assignment. It's the Teams' responsibility to ask questions until the assignment is clear to them.

• Definition of Fun
In each Team, the Team members decide for themselves what is needed to pleasantly work together and make agreements about this.

Ceremonies that come back every Sprint

Each Sprint is a container for the following five fixed Ceremonies that provide structure, optimise learning and reduce risks. Each Ceremony of the Sprint is also an official moment to check and improve (in Scrum: inspect and adapt).

• Sprint Planning (incl. points poker)
During Sprint Planning, a Team plans the work that is ahead of them in this Sprint and prioritises it on the Scrum Board. The Sprint Planning takes 20 minutes (copying tasks) to 2 hours (working out planning).

The Product Owner starts the Sprint with a brief repetition of the Release Planning, so the Teams know where they're heading and the goal and importance of the upcoming Sprint are clear. The Product Owner gives the Teams the Sprint Backlog, Sprint deliveries, Definition of Done and To Do list, or teaches the Teams to work on these aspects themselves. Over time, the Teams will become increasingly self-organising.

The Teams put the Sprint Backlog, Sprint deliveries, Definition of Done and To Do tasks on the Scrum Board. Each Team estimates the weight of each task (using poker points) and makes a Burn Down Chart. Finally, the Product Owner checks the Scrum Board, the Team commits to the work of the Sprint and then the substantive work can commence.

• Stand-up
Each Team meeting (each class) starts with a short Stand-up. Each Team gathers around its own Scrum Board to discuss progress and to identify problems.

The Stand-up provides teambuilding, energy and focus, and stimulates Team members to get to work, to help each other and to learn from each other. A second shorter Stand-up at the end of the class stimulates the Teams to make their own agreements about any homework that needs to be done.

A Stand-up takes a maximum of 5 minutes. This includes putting up and storing the Scrum Board and rearranging the desks.

The Teams themselves are responsible for the Stand-up. The Scrum Master facilitates the Stand-up and makes sure that all Team members answer the following questions and move their tasks around the Scrum Board:
1. What tasks for the Team have I finished?
2. What will I be doing next for the Team?
3. Are there any problems or can I continue?
Each Stand-up is concluded by asking: 'Are we going to make it?' (Burn Down Chart).

• **Sprint Release**

During Sprint Release, the Teams deliver the work that was agreed on: they present it and get feedback. Delivering work is not the same as handing in a product. As the Product Owner, the teacher determines in what form delivery and feedback are given. The time needed strongly depends on the chosen form.

The Sprint Release is an important moment for the Teams to check and improve their work and progress. Is this part of our task OK or is there room for improvement? Have we mastered the learning objectives or are there things left to learn? The Sprint Releases should be seen as markers that Teams need to tick off on their way to the end goal. Every marker is an opportunity to check and improve, and every marker that can be ticked off will give a feeling of success and competence.

Two important rules apply to the Teams:
1. only deliver work that has been tested: this ensures that knowledge is shared among Team members, that work is of better quality and that students become critical towards their own work
2. *deadline is deadline*: this prevents delays or lagging behind, and shows the students that they are taken seriously

As the Product Owner, the teacher is to provide good feedback, either his or her own or peer feedback. When working for an actual client, the client and stakeholders should also provide feedback. The feedback ties in with the Definition of Done. The feedback should be specific, concrete and progression oriented, and is given directly after the delivery (just-in-time). Teachers make sure that the time they spend on corrections decreases rather than increases.

For Sprint Releases, formative testing and assessment is more effective than grading. Grading stops the learning process and discourages Teams from improving their work. The last Sprint Release is an exception, as it usually results in a grade.

• **Sprint Review**

The central question during the Sprint Review is: *what* did we learn? The Teams analyse the collected feedback and thus the quality of their work. Each Team decides for itself what points of improvement there are and puts them on their Scrum Board. The Sprint Review takes 15 to 30 minutes.

The Sprint Review gives Teams control over their own improvements. It gives them ownership and self-confidence, and promotes a Kaizen mindset. Students will experience that feedback is valuable and will no longer see it as criticism. Their learning results will also improve.

The Scrum Master facilitates a suitable working method for the Sprint Review and ensures that the Team discusses the following questions:
1. What feedback did we get?
2. Of the work we've done, what is good? What do we understand well?
3. What else do we want to improve?
4. What tasks do we need to plan to improve?
5. How far are we from our final goal?

The proceedings of the Sprint Review can be recorded in a Team logbook, so the Team can document its own learning process.

• **Sprint Retro(spective)**
The central question during the Sprint Retro is: *how* did we work? The Teams discuss their own working methods and collaboration. Each Team comes up with points for improvement, puts these on their Scrum board and/or adjusts its own Definition of Fun.

For the Teams, the Sprint Retro is the moment in which they explicitly discuss their collaboration, working method and every Team member's share in this. It promotes openness and satisfaction within the Team, and prevents growth of irritations. Students will start to see the Teamwork less as some kind of lottery and more and more as something they themselves can influence. Of course, Team members don't necessarily have to wait for the Sprint Retro to express that something is bothering them.

The Scrum Master facilitates a suitable working method for the Sprint Retro and ensures that the Team discusses the following questions:
1. What went well?
2. What can be improved?
3. What will be our point of action in the next Sprint?

The proceedings of the Sprint Retro can be recorded in a Team logbook, so the Team can document its own learning process.

10. Instruments of Scrum@school

• **Scrum Board**
The Scrum Board is a planning board that makes the work of the Team visible and transparent. It gives a brief overview of the entire assignment and shows the detailed planning and progress of the Team in the current Sprint.

The Scrum Board provides overview and structure, fair distribution of workload, speed and quality, and it facilitates targeted coaching.

Each Scrum Team has its own Scrum Board. During the assignment, the Team always keeps the Scrum Board up to date. Physical boards provide more overview and promote interaction within the Team, between Teams and between Team and teacher. Physical boards are therefore preferred over digital boards.

• **Product Backlog**
The Product Backlog is a brief list of the larger tasks a Team needs to get done in order to finish the final product. Each task on the Product Backlog is copied to a post-it and given a certain priority on the Scrum Board.

The Product Backlog is either given to the Teams by the Product Owner, made by the Product Owner and the Teams, or made by the Teams with a little help from the Product Owner. In open projects, instruments like Iceberg and Storymap can be used. The Product Owner is ultimately responsible for the quality of the Product Backlog. The Product Backlog can be adjusted during the assignment.

- **Sprint Backlog**

The Sprint Backlog is the short list of items a Team will be working on during the Sprint. The Sprint Backlog is both a more detailed plan of a part of the Product Backlog and the summary of the To Do list. Each item of the Sprint Backlog is copied to a post-it and given a certain priority on the Scrum Board.

The Sprint Backlog gives Teams an overview of the work in the Sprint. The items from the Sprint Backlog logically lead to the Sprint deliveries.

The Sprint Backlog is either given to the Teams by the Product Owner, made by the Product Owner and the Teams, or made by the Teams with a little help from the Product Owner. The Product Owner is ultimately responsible for the quality of the Sprint Backlog.

- **To Do list**

The To Do list is a list of tasks the Team will perform during the Sprint. For this list, the items of the Sprint Backlog have been divided into small tasks. These tasks should preferably take less than 20 minutes and never longer than the duration of one class. Each task is copied to a post-it and given a certain pritiority on the Scrum Board.

The tasks are described clearly and split into small enough segments so that each Team member knows what the task entails and it’s easy to get started on it. There’s also variation in both learning activities and learning strategies. All tasks contribute to the learning goals or Sprint deliveries.

The To Do list is either given to the Teams by the Product Owner, made by the Product Owner and the Teams, or made by the Teams with a little help from the Product Owner. The Product Owner is ultimately responsible for the quality of the To Do list.

- **Definition of Done**

The Definition of Done describes the requirements that Sprint deliveries must meet before they are truly 'ready and good', or in other words: 'done'. The Definition of Done is put on the Scrumboard.

The Definition of Done provides the Teams with guidance during their work, as well as criteria to test their deliveries. This way, a Team will take on a more critical approach to its own work and will deliver work of better quality. The Definition of Done is also the guideline for feedback during the Sprint Release and will thus result in feedback of good quality.

The Definition of Done is either given to the Teams by the Product Owner, made by the Product Owner and the Teams, or made by the Teams with a little help from the Product Owner. The Product Owner is ultimately responsible for a sharp and comprehensive Definition of Done.

• **Definition of Fun**

The Definition of Fun describes what a Team needs to pleasantly and productively work together. The Definition of Fun is on the Scrumboard.

The Definition of Fun makes needs and agreements explicitly clear and helps a Team to improve the way it functions.

Each Team determines its own Definition of Fun at the start of an assignment and alters it after each Sprint Retro, if necessary.

• **Burn Down Chart**

The Burn Down Chart is the graph that shows the progress of the work during the Sprint. The vertical axis shows the number of poker points, the horizontal axis represents the time line. The Burn Down Chart is put on the Scrumboard.

The Burn Down Chart shows whether a Team will meet the deadline. This reduces stress and gives the Team the opportunity to make adjustments, to work from home or to address unsolvable problems and discuss them with the Product Owner.

The Team updates the Burn Down Chart after every Stand-up. Instead of a Burn Down Chart, other methods can be used (e.g. bar charts, building blocks).

End note

We've been working on an educational adaptation of Scrum since 2013. We've presented Scrum@school during the first international conference on Scrum in education (2015, Utrecht Netherlands).

This Guide documents the Scrum@school framework as it was originally developed, and then evolved and maintained. Other publications describe the underlying principles, didactic guidelines and insights that complement this framework. Together, they can make education more valuable and effective.

Scrum@school is a didactic framework in which rules, roles, ceremonies and tools are invariable. Scrum@school only exists as a complete didactic framework. Although it's possible to implement parts of Scrum@school, the result is not Scrum@school and revenues are smaller. However, it can be wise to adopt Scrum@school step by step, adapted to the pace and level of the group.

Scrum@school functions well as a didactic base for other educational methods and working methods (context concept, formative testing, didactic coaching, peer feedback, real clients, personalized learning objectives, etc.).

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Should you like to make a translation of this Guide or should you have any other questions, please feel free to contact us at info@scrumatschool.nl.

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