

AGILE LEARNING IN FURTHER EDUCATION

A WORK BASED APPROACH FOR IN-SERVICE TRAINING

Joerg Longmuss¹, Benjamin Hoehne²

¹Sustainum Institute Berlin (GERMANY)

²Beuth University for Applied Sciences Berlin (GERMANY)

Abstract

The rapid technological development leads to an ever-increasing complexity in work environments. Thus, further education shall now more than ever relate directly to requirements of the working environment. The goal is to create a learning method which allows employees to acquire necessary key competencies within their work place, creating an embedded system of learning and working.

With the "Agile Learning" concept, competences needed in an organisation are acquired within the company in processing of real-life problems from the learner's own field of work. This means self-directed learning of teams in short stages, supported by coaches and reviewed by a "project owner". There are already experiences from several different companies with this new learning concept. Characteristics are:

- Learning new skills in the work process: no transfer losses
- Real projects, real work, no training simulation: no loss of time.
- Collegial consulting and reflection in the team: no loss of experience

After an introduction into the learning concept, two methods to support agile learning projects will be discussed, the "learning card" format and an application of the Kanban principle. These methods are not only suitable for use in companies, but also for project-based teaching methods at universities.

1. THE „AGILE LEARNING“- APPROACH

Shorter innovation cycles in the work cause an increasing frequency and intensity, with which employees must study further and acquire new competences (see e.g. [1]). However, classical forms of qualification (e.g. seminars, continuing education courses) do often not fit precisely enough with the individual competence requirements and at the same time react too slowly to the dynamics of change in companies. Needed are forms of further education for in-service competence development that show:

- **High scalability**, to enable qualification measures from a few hours to several hundred;
- **Content adaptability**, to include new topics as quickly as possible;
- **Connectivity** to existing organizational structures and software infrastructure in order to start with little effort.

To implement such competence development in companies, the "Agile Learning"-Approach was developed [2], which is based on the principles of research-based learning [3]. Its aim is to promote learning within the work process and by means of real tasks, thus making competence development and knowledge transfer a continuous component of company's organization.

1.1 Learning at work, based on real-life tasks

For a targeted development of competences required in the company, it makes sense that the employee does not learn on general tasks or case studies from a different environment, but in processing real problems from their own field of work. This means that:

1. First, the new competencies that are relevant or will be foreseeably relevant for the employees ("**learning topics**") are precisely determined, then
2. Appropriate tasks from the operational practice, in which these competences are needed ("**learning occasion**"), are identified and finally
3. these tasks are exemplarily processed with technical and didactic support ("**coaches**").

The work on the learning task takes place alternately between individual and group work. At longer intervals - the learning stages - the learning progress is presented to the project owner and accepted by him/her or necessary reworking is made clear. This is followed by reflection on the learning process and an adoption of goals and procedures for the next stage (see figure 1). The coaches rather play the role of a learning facilitator or a supporter than of a traditional teacher

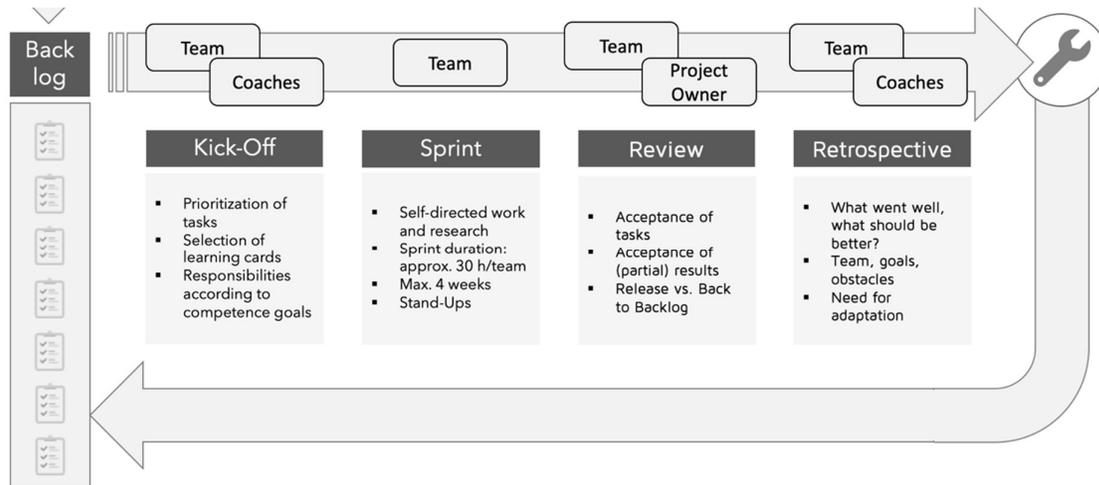


Figure 1: Stages of an agile learning project

This form of learning – in stages on the basis of tasks from one's own practice in interaction with a project owner and coaches – has been established in the last years in several German companies, from start-ups to big international enterprises and with learning topics ranging from project management or spread sheets to communication techniques (for details see [4]). Since it uses methods and tools of agile methods of project management, in particular of SCRUM, it is mainly named "Agile Learning", although other terms are used, too (e.g. [5]).

1.2 Effects of the learning format

This learning format requires a deeper involvement of superiors and of the human resources Departments. Conventional further education takes usually place outside the company, the participants go somewhere else and return several days later, hopefully loaded with new knowledge and competencies. And if not: Hardly anyone will really notice. However, in Agile Learning the superiors have to think about the exact competence needs and select practical tasks, where they can be learned. Later then, they have to examine the team results as "project owners" and accept or reject them. So they are deeply involved in the learning process of their team, meaning more efforts, but also a much better understanding of what their employees have learned. Likewise, the human resources department has to organise the learning process within the company. Still, so far in all cases the approach received a positive response from participants as well as from management.

Practical Example: A learning project with a team and an individual component

In a company, the subject area project management was determined as a learning topic and a group of employees was selected for it. The members of the learning team were to acquire practice-relevant competencies based on current projects in their field, including the handling of interfaces and overarching functions in the company (controlling, quality assurance, purchasing, regulatory approvals, supplier support, etc.). Therefore, it was decided that there should be a two-part learning project.

In the first phase, the team members worked on a study that was equally relevant to all of them and their areas of work. With this study, they learned about and used basic elements of project management (including project structure plans, work packages, set-up and scheduling, time and cost control). In the second phase, each member worked on a separate project from his area. The individual work was synchronized and compared during the stopovers. There the team presented the work status, discussed personal challenges and gave peer feedback. Accompanying this, the coaches gave on-demand technical and didactic input to support the processing of the learning objectives.

Finally, in a joint presentation, the team presented the results of the individual projects - which all clearly exceeded what they had already done before – to the management. Their results were acknowledged with respect, because the team had not only learned considerably about project management, but also understood a lot more of the internal processes of their company.

This learning directly on and in real practice has several advantages:

- **The employees learn exactly what they need for their work**, not what is offered in general seminars. Admittedly, the required content can usually be acquired in these seminars as well, but usually together with a lot of unnecessary content. This makes general seminars extensive and annoying for the participants.
- Accordingly, the learning results **are directly applicable in everyday life**. This does not only refer to the content, but also to the work equipment used (computers, software, data structures, ...) as well as communication structures, responsibilities, and experts in the company.
- The usefulness of each learning step is immediately apparent. **It is not learned "in advance"** in the hope of using it someday. This increases the motivation to solve even difficult or lengthy tasks.
- The learning topic becomes more accessible to the employees because significantly less abstraction and transfer performance is required of them to recognize their practical problem behind the task. **This facilitates access to the topic especially for practice-oriented persons.**
- The participants experience a higher degree of **self-efficacy** because they can successfully try out new skills in a previously unknown field of learning and thus experience their own competence increase directly and related to their daily work.
- For comprehensive projects, **the handling of operational tasks is also resource-efficient**, since these tasks would have to be processed anyway. In addition, the employees remain in the work process and are not completely out of house for a longer training.

2. METHODS TO SUPPORT AGILE LEARNING

To this end, the authors have developed various approaches, two of which will be presented in more detail here, as they particularly support Agile Learning in practice. These are

1. Learning Cards: A format specifically developed for the transfer of knowledge and
2. Kanban: the adaptation of a common method of work organization in Scrum.

2.1 Learning cards

Learning on the basis of practical tasks reverses the usual form of continuing education – and also the usual teaching at universities. There the teaching form of the "course" ([6]) prevails: First, a defined canon of knowledge is presented (in a lecture or in a script), which is then - in the best case - to be applied in more or less practice-oriented tasks. In agile learning, the practical problem is the starting point. The learners have to work on it, similar to Problem Based Learning (PBL, see e.g. [7], [8]), following the steps

1. Define the problem first
2. Develop solution strategies
3. Research the required knowledge
4. Develop solutions

This poses two questions for the coaches who prepare the learning:

- Which contents should be conveyed within the framework of competence development?
- How are the contents made available to the team?

In contrast to PBL at universities, for example, the knowledge required for processing should not first have to be researched in general sources. University libraries, etc., are usually too extensive to find specific information in a timely manner, and online searches often lead to sources of low trustworthiness. This leads to loss of time and to uncertainty, which is difficult to justify in a job-integrated competence development.

The task to be completed should therefore be prepared by the coaches in a form that is adapted to the goal-oriented, step-by-step process. For this purpose, the authors developed the digitally supported format of the "learning card". These are knowledge units whose processing usually takes no more than 30 minutes. This makes them easy to use even when learning at work, because they do not block long periods of time.

For these learning cards, this structure has proven to be effective:

- Name the occasions (e.g. "moderation of a small group") when it is necessary / helpful to process the learning card,
- Give exemplary results (e.g. "Can create a schedule for a work meeting") that can be achieved with the application,
- Present and explain the relevant content, and finally
- Set assignments in which the content must be applied.

These tasks should be formulated in such a way that the processing of the learning card also means a direct progress in the processing of the learning task, e.g. "List the work packages necessary for your project" or "Determine the communication strategy for your next stakeholder meeting?". In this way, the processing of the entire learning card as a whole or a single task from it can be integrated directly into the work planning of the learning group.

On the website <https://academy.agile-learning.eu> you may find some examples of learning cards which meet these requirements and are used for agile learning projects. For a better understanding, figure 3 shows a sketch of the structure – without graphics and content. This format is also suitable for other activating teaching/learning formats in which learners are to acquire knowledge on their own.

2.2 Kanban

Kanban (Japanese for "card") is widely used in production systems and is a simple way to divide the work on complex projects into smaller tasks and visualize them. The principle is well suited for agile (learning) projects, because at the beginning of a learning project not all tasks are already known and priorities may change. In its simplest form, a Kanban board consists of three columns (To Do, Doing, Done) in which the tasks are organized, one card per task. For the organisation of an agile learning project it has become established to work with four columns (To Do, In Progress, Check, Done). The check column is introduced to signal that a task has been completed from the team's point of view. If the result was approved in the review meeting, the card with this task can be moved to Done.

Learning cards can easily be integrated into the work with a Kanban board. They are sorted as individual tasks under To Do. Shifting it to Check and then Done indicates the content has been processed. Thus, for the project owner, the status of the acquisition of knowledge is clear at the same time as the work status of the team.

If an analogue Kanban board is used, it should be visible and easily accessible to all team members and be updated regularly. If the status of the tasks cannot be seen "in passing by", regular stand-up meetings should be held between the team members (approx. 15 minutes) to inform all participants about the status of the processing. The team members have to take care on their own that they remain informed about status changes.

An alternative to analogue Kanban is the introduction of a digital Kanban board. There are commercial IT-tools like SharePoint, Jira or Trello that are supposed to support the general cooperation within an agile team. However, they do not take into account the special requirements of Agile Learning: being easy to understand, easy to handle and not overloaded with unnecessary features. Therefore the open source software PILES (Project Integrated Learning System) has been developed. It allows to implement an automated notification in case of a status change of tasks, to place comments on the status as well as to upload documents and learning cards for an ongoing learning project.

3. PRACTICAL EXPERIENCE

The authors have now by been able to use the concept of Agile Learning in several companies, some of them extensively, for the development of professional competencies. The concept had been evaluated using a broad variety of methods from interviews with participants, project owners and coaches over learning diaries and comprehensive reflections to standardised checklists to determine the degree to which the learning objectives were reached. In this, Agile Learning as a format has proven itself throughout [4], [9].

For the methods introduced here, the learning cards as a form of pre-structuring of knowledge and the Kanban board as an agile organizational form, some specific results have emerged (as stated also in [10]):

Learning cards

- Learners are often focused on completing the learning task and try to avoid anything that is not directly related to it. Therefore, a learning card must facilitate and support this path directly and not be perceived as a detour. If the card does not bring a learner closer to her/his problem solution, it is unsuitable and will be disregarded.
- Playful elements such as a quiz increase interest and motivation.
- Further web links and possibly literature stimulate, once the interest is aroused, surprisingly often an additional occupation with the learning topics.

Kanban

- The simple visualization of tasks and their progress is very well received. In some cases the participants of learning projects have built themselves a Kanban board for their everyday tasks.
- Each card with a task that is currently to be processed must also contain a responsible person - who can change during processing. Otherwise it happens again and again that a task is ignored by the whole team.
- The board is only helpful if it is used continuously. If the work status recorded there is frequently not up to date, it is no longer observed.

4. RESUMEN

The combination of these two tools of support for Agile Learning has been successful in the companies where it was applied. The learning progress became more visible and transparent, in particular for the project owner. It made it also easier for the coaches to direct the process. This is an encouraging experience we would like to continue.

At the moment it requires still considerable time and effort to have the learning cards ready on time when required by the learning process. However, once more cards have been produced (within the next months there will be around 60, mainly on different aspects of project management and communication and all under an open licence), it will be easier to work with them because most cards can be used in many learning projects.

5. LITERATURE

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