

# Competency-Based Self-Directed Learning and Assessment: A Model for Vocational and Continuing Education?

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**Abstract**—Self-directed learning in the workplace supported through technologies has been a trend for quite some years. In combination with Competency-Based Training and Assessment it is a model for effective individualized training that has a great impact on the employee performance.

**Index Terms**—Self-directed-learning, Workplace-Learning, Competency-Based-Learning,

## I. INTRODUCTION

Self-directed learning in the workplace has been a topic for quite some while. It is found in the work of Schön [1], [2], De Jong [3], Kolb [4], Knowles [5], Long [6] and could be tracked back up to Dewey [7]. But how can e-learning facilitate self-directed learning in the workplace? This paper offers insights from two successful projects. First, self-directed learning is individualized learning. The learner decides what learning objectives are important to him or her. In the workplace the learner is not totally free in making decisions. Learning in the workplace must benefit the company. After all, it's the company that defines, what's important for successful performance today and tomorrow.

A competency matrix is an ideal tool to combine an individual view with the organizational view. The organization can define competencies that are important for their business. Learners can use this matrix for their orientation, reflection on their own competencies and steering decisions. Both projects presented use a competency matrix as a framework for individual self-directed learning. This article shows how a competency matrix could be developed and how it could be used for workplace learning.

## II. APPRENTICESHIP AS IT-ELECTRONIC TECHNICIAN AT GERMAN TELEKOM

German Telekom is one of the biggest providers of apprenticeships in Germany. About 9'000 apprentices and students (2012) work and learn in 33 training centers and in different business divisions. A large group of this apprentices training to be IT-System electronic technicians. For three and a half years they work in various areas of the company. In addition to working at the German Telekom they attend a vocational school for

one or two days a week and visit regular courses in the training centers.

Self-directed learning at the workplace is an important component of German Telekom's didactic concept. The vocational training concept supports the self-directed learning with several steering instruments. The apprentices document their individual competencies in the "Identity Card". Apprentices define their general learning goals for every year. Before every starting at a new department they define their learning objectives and development tasks for the practical work in the "Agreement for the internship". This Agreement is analyzed after the internship. The apprentices are responsible for their orientation, the planning, reflection, and the documentation of their own competencies. During this process they are supported by learning coaches on several reflection meetings.

To support the process of self-directed learning and to foster the use of the steering instruments, German Telekom developed a competency matrix for the specific job profile. The University of Flensburg/Germany elaborated the characteristic work tasks and the competency areas in a qualitative research design.

According to Spöttl/Becker, competency is professional expertise that gets apparent as a performance in the action of a person. A competency description therefore should describe the professional action itself. Competencies in a vocational setting are domain specific. Domain in this case means the occupational field or the profession [8] [9]. To describe the competencies in the domain of the IT-System electronic technicians at German Telekom, the University of Flensburg observed experienced IT-System electronic technicians in their daily work. Based on this observations they described main working processes and working tasks. These descriptions were presented, discussed and modified in expert workshops. So a competency matrix with five main working processes was designed. To each of these competency areas there are up to six assigned competency development steps, from novice to expert [10].

In an electronic version of the competency matrix the apprentices rate their current competencies, orient themselves regarding learning possibilities, plan their next learning steps and reflect about their learning after the internship. The competency matrix is connected to the Wiki-Website of the training division so that the

### Combination of steering instrument for self-directed learning

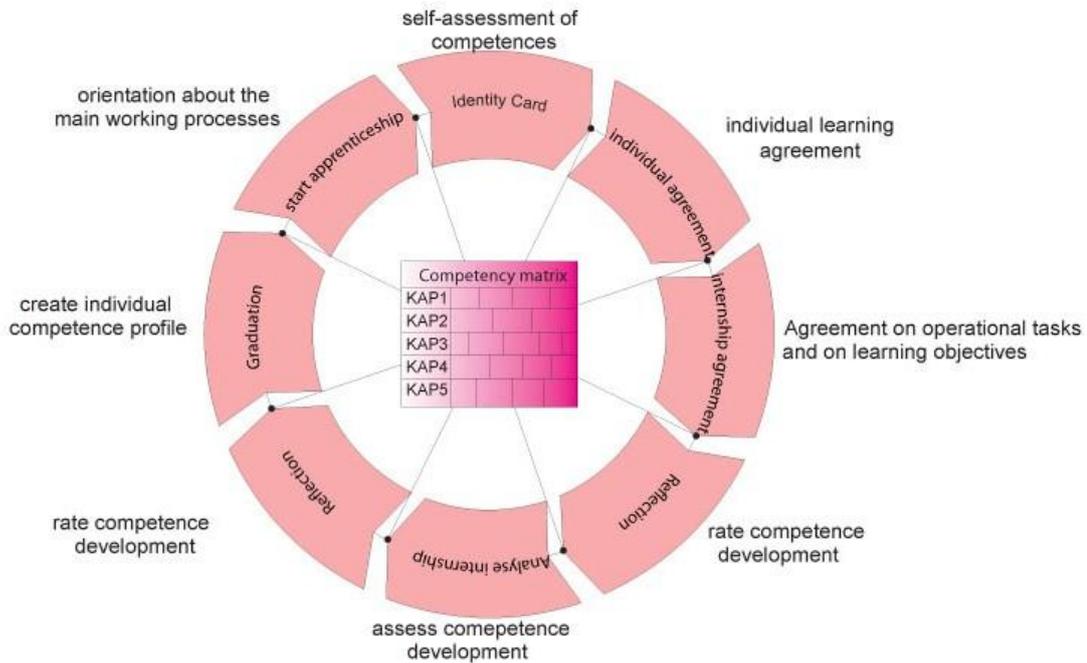


Figure 1. Combination of steering instruments for self-directed learning in German Telekom

apprentices get access to learning materials. The competency matrix was implemented and tested in a pilot project. This pilot project was evaluated. In the evaluation of the pilot project over 650 apprentices and

University of Flensburg also started to build up additional matrices for other job profiles.

#### III. TRAINING OF PROJECT CYCLE MANAGEMENT FOR RESULTS AT SDC

The Swiss Agency for Development and Cooperation (SDC) is Switzerland’s international cooperation agency within the Federal Department of Foreign Affairs (FDFA). In operating with other federal offices concerned, SDC is responsible for overall coordination of development activities, cooperation with Eastern Europe, as well as for humanitarian aid delivered by the Swiss Confederation. SDC cooperates with various Swiss NGOs and with international NGOs. SDC employs around 1’500 people in Switzerland and abroad.

Project Cycle Management for results is a topic of increasing importance for international development and cooperation. International cooperation has grown in complexity; modes of cooperation have changed, as well as the levels of intervention. This led to a request that international development should achieve concrete, measurable and sustainable results. Hence several international conferences had been held to improve the effectiveness of international cooperation. In 2000 the UN General Assembly approved the Millennium Development Goals: eight concrete and measurable goals that should be achieved by 2015.

Developing countries, multilateral organizations, and donor countries agreed in 2005 on five basic principles in the “Paris Declaration on Aid Effectiveness” [11]:

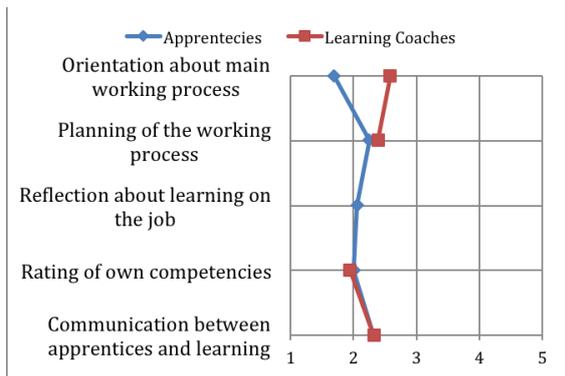


Figure 2. Effects of the new tool on orientation, planning, reflection on and rating of own competencies and on the communication between apprentices and learning coaches on a 5 Point Likert Scale (1 = strongly agree, 5 = strongly disagree)

about 60 learning coaches worked with the competency matrix. The new tool had a positive impact on apprentice’s self-direction, planning the next learning steps, reflection on competencies and communication with learning coaches and skilled workers.

In a next step the project will be adopted to all apprentices in the field of IT-System electronics. The

- **Ownership:**  
The partner countries (developing countries) take control of their development policies and strategies;
- **Alignment:**  
Donors align their aid with national development strategies, institutions and procedures;
- **Harmonization:**  
Donor countries coordinate their activities;
- **Managing for Development Results (MfDR):**  
Resources are managed and decision making processes improved to achieve development results;
- **Mutual accountability:**  
Donors and partners are accountable for development results.

Training linking these new principles and related management methods is one important aspect to improve the quality of international cooperation.

SDC's "Project Management for Results" training has been done so far by the Swiss Federal Institute of Technology in Zurich (ETH Zurich), Department of Development Cooperation (NADEL). The training course is based on a script for the Master of Advanced Studies for Development and Cooperations.

Due to rising demand and the fact that learners work all over the world, SDC started a pilot project to find out if the training could be delivered as an e-learning course. The idea was to offer the course via a platform as enhanced books. In the first pilot phase one module of the course was developed as an enhanced book on a html 5 basis. The enhanced book consists of the script and additional material like a short video films to explain cases, bespoke presentations, interactive graphics, quizzes and further readings in PDF files or links.



Figure 5. The enhanced Book can be used on PC, Tablet or mobile Device

This module was tested in various countries. Evaluations showed that enhanced books can be used in developing countries.

In a second step, the platform and two more modules were developed. Due to the fact that the learners need different competencies for their work, the project group decided to foster the learner's self direction with a competency matrix.

#### A. Individual Learning paths

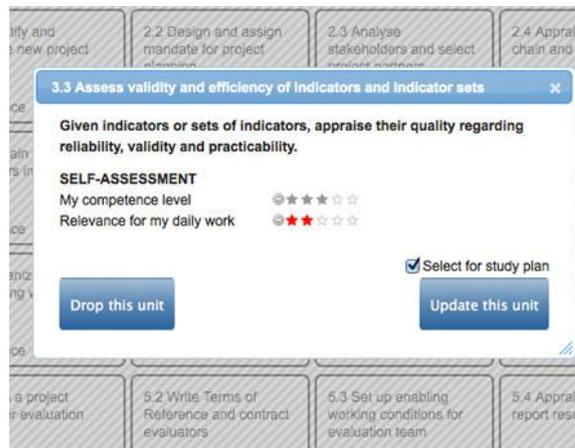


Figure 4. In the study section the learner can design his individual learning path.

This competency matrix is located in the platform's "study" section of the platform, the main starting point for learners. As a first step they rate their current competencies. In a second step they rate the importance of these competencies for their work. This reflection is done best with the line manager or a colleague to combine the self-perception with the other's view.

Based on this rating, the system gives a recommendation which competencies should be improved. The recommendation is based on the assumption that a learner should initially improve competencies which are most important to his job. We call this rating "calculated priority". The learner can override this rating by setting due dates and creating his individual study plan. A plan with four to 12 learning steps is provided for every competency the learner wants to improve. Learning activities for these learning steps vary from reading and working in the enhanced books or additional material to transfer assignments like implementing the topics learned in their own work environment.

Learners who prefer a thematic approach will find the five enhanced books in the "read" section. Here they can read the whole script.

Those learners who want to use the platform as a library will find all additional material in the "browse" area.

#### B. Organizational aspects and liability

Participation in this training initiative is still optional at the moment. Nevertheless, the topic is identified as the key means to improve the quality of international cooperation. According to Euler et al. [12] you can foster the transfer of new competencies into the workplace by the design of the training event and/or by the design of the workplace. The transfer orientated design of the training event focuses on three points:

- The content and learning objectives should have a close relationship to workplace problems and challenges. This is implemented through the general definition of content that should be as close as possible to the related working field. But it is fostered even more by self-directed creation of the study plan. Here learners should choose those competencies that have a close relationship to their jobs.
- Implementing transfer-oriented learning activities like transfer assignments and reflections.
- Setting tasks with due dates and reminders through the platform.

It is not possible to influence the workplace learning culture in the work place directly with a single training initiative. But it may be possible to anchor transfer-orientated elements within the organization. Research showed [13] [14] that a line manager has a great impact on on-the-job learning and also on the transfer from of-the-job learned competencies into daily work. The ongoing task for this project is to involve line managers in the learning process by:

- helping their employees reflect on their competencies;
- using the competency matrix in the annual appraisal and defining concrete learning tasks for the next period;
- helping employees use the new competencies in their daily work.

### C. Outlook

After the platform and two more enhanced books were produced another evaluation round took place. 23 persons tested the platform and the books in different countries. Feedback was given in an online survey. In addition, several qualitative interviews with line managers were conducted. Evaluation of this phase showed that individual self-directed learning was endorsed by participants. Some of them had problems appraising their own competencies, which led to the recommendation to use peer review or to talk about the competencies with the line manager. A significant number of participants mentioned that it could be helpful to have some kind of exchange – especially on transfer assignments. One next step would be to organize a support structure for content-related questions and hence to combine this project with existing community platforms and communities of practice.

## IV. CONCLUSION

Both projects use a competency matrix to foster self-directed learning with slightly different approaches. In both examples the competency matrix is used as a tool to orient one to a working and learning field, to reflect on competencies, and to plan the next learning steps. The first example focuses on workplace learning and informal learning “on the job”. Acquisition of knowledge occurs individually or via a link to the Training Wiki as a collaborative process. The second example uses the

competency matrix to frame self-directed learning and link it with learning materials provided by the organization.

Both evaluations showed that a competency matrix helps employees to reflect on their competencies, to structure their next learning steps, and to become aware of their own competencies. Especially the reflection on personal competencies is challenging for most employees. Line managers or coaches could support this reflection and the transfer of new competencies into the job.

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