

Designing Workplace Learning and Knowledge Exchange

A Postgraduate Training Program for Professionals in SME

Annemarie Hilbig, Antje Proske, Gregor Damnik, Franziska Faselt and Hermann Körndle
Psychology of Learning & Instruction, Dresden University of Technology, Zellescher Weg 17, Dresden, Germany

Keywords: Further Education for Small and Medium-Sized Enterprises, Enhancing Internal Company Training, Blended Learning, Informal Learning, Virtual Classroom Sessions.

Abstract: In small- and medium-sized enterprises (SME) training requirements differ widely and can hardly be covered by broad training programs. For this reason these SMEs heavily rely on internal company training and informal knowledge exchange between co-workers to effectively use pre-existing resources like highly specific expert knowledge. To this end, professionals need to be trained in efficiently communicating their subject-specific knowledge as well as in realizing informal learning opportunities. Hence, in the postgraduate training program “Designing workplace learning and knowledge exchange” (aquwa) professionals are taught the necessary didactic competencies. The training takes place parallel to work over a 12-week period in a blended e-learning format. Modules 1 and 2 deal with principles and methods of knowledge exchange. These principles and methods are further elaborated in Modules 3 and 4, culminating in participants’ independent development of an informal learning opportunity at the workplace. The evaluation of the training shows a great acceptance of the course design as well as a significant learning gain over time. Most of the participating professionals recognised a successful transfer of the gained competencies into their workplace. Based on participants’ remarks suggestions for online-based postgraduate education courses are provided.

1 INTRODUCTION

In small- and medium-sized enterprises (SME), especially in those which provide highly specialised products and services, professionals are considered as an important factor for being innovative, and hence, for being competitive. As a result training requirements of such enterprises differ widely and can hardly be covered by broad training programs. The percentage of SME using further education is very small (Lenske and Werner, 2009). Reasons are a lack of resources. However, SME especially are more affected by demographical and cyclical based skills shortage than large-scale operations.

One possibility to tackle these problems is to maximize already existing personal resources in the company. The idea of the postgraduate training program “Designing workplace learning and knowledge exchange” (aquwa) is to show professionals how to teach their expertise to other employees. Thus, in aquwa, professionals are taught to communicate their subject-specific knowledge to

co-workers more efficiently. Moreover, professionals become qualified to plan and conduct SME internal learning opportunities and to initiate and foster knowledge exchange within the company (cf. Desouza, 2003; Kyndt et al., 2009).

2 COURSE DESIGN OF AQUWA

The postgraduate training program aquwa lasts 12 weeks and consists of four modules. The contents are made available on a weekly basis. The program contains texts for self-regulated study which are accompanied by workplace-relevant group work, exercises, role-plays and other interactive interventions during virtual classroom meetings (see Table 1). Thus, participants are able to attend the training program while working fulltime.

Whereas a kick-off meeting and a closing event take place at the TU Dresden, the contents are conveyed completely online. This eliminates travelling time and also travelling costs for the

participating SME.

Table 1: aquwa - a combination of text for self-study and virtual classroom sessions.

Texts for self-study
<ul style="list-style-type: none"> ▪ Preparation for the virtual classroom sessions ▪ <i>Materials</i>: texts, illustrations, worked out examples, interactive exercises, videos
Virtual classroom sessions
<ul style="list-style-type: none"> ▪ Content from the self-study texts are discussed and elaborated ▪ <i>Methods</i>: live-presentations, exercises in groups, case studies, role plays, discussions, coaching

2.1 Informal Learning

People learn at work by participating in various situations, collaborating with colleagues and clients, developing and testing new ideas, or meeting new challenges (Leslie et al., 1997; Tynjälä, 2008). These activities correspond to the term of informal learning. Furthermore, informal learning is considered as learning outside of educational institutions and without a specified curriculum (Eraut, 2004). Thus, the contents of the aquwa training programs are derived from theoretical and empirical findings on informal learning.

In informal learning settings learning arises from mastering new and unfamiliar working tasks (Stern and Sommerlad, 1999). One method to foster the learning success in informal learning is to enhance the support when working on an unfamiliar task (Overwien, 2005). Thus, the participants of the training program aquwa are taught competencies which are useful for preparing and providing such support.

2.2 Modules

The training program contains four modules. Module 1 and module 2 serve for participants' knowledge acquisition, whereas module 3 and 4 prepare and ensure transfer.

In Module 1 participants acquire knowledge on principles for preparing knowledge such as how to effectively communicate in written form, or how to design exercises to foster learning.

Module 2 presents participants with methods for knowledge exchange, for example to explicate tacit knowledge, to provide constructive feedback, or to moderate discussions.

All these principles and methods are important for professionals who want to exchange their knowledge because they represent facilities which can support informal learning. However, informal learning at the workplace is versatile so it is not necessary to use every method in every case. Professionals have to decide from case to case which principle and which method is most suitable for a particular learner in a specific situation. Thus, in module 3 the problem-oriented application of the principles and methods is addressed. Here, participants design and evaluate sample learning situations, or create pieces of instructional materials and exercises for given topics.

During module 4 participants by themselves develop an informal learning opportunity. This includes the generation of educational material and/or documents for the implementation of the learning opportunity at the workplace.

The four modules build upon each other. During the knowledge acquisition phase, participants practice the principles and methods taught in small exercises, in module 3 participants are required to apply a combination of the contents of module 1 and 2 to solve the presented problems. Finally, in module 4 the participants have to apply all their knowledge acquired in aquwa to design a complete, realistic informal learning opportunity. Thus, during the training participants are confronted with tasks of increasing complexity accompanied by decreased tutoring and scaffolding (van Merriënboer et al., 2003). By not only acquiring principles and methods, but also by applying them to problem-oriented and work-related scenarios, it is expected that participants do not acquire inert knowledge, but rather knowledge that can be used for effective problem-solving in realistic situations, finally leading to a successful transfer to the workplace (e.g., Eraut, 2004; see also Merrill, 2002).

2.3 Implementation and Participants

A pilot study started with 16 professionals from different SMEs in Saxony (Germany). 11 participants completed the program. Log-file analyses showed that on average every participant spend 75 minutes per week on the self-study texts and attended 9,5 of the 12 virtual classroom sessions.

3 EVALUATION METHODS

The training program was evaluated in accordance

with an evaluation model by Kirkpatrick (1994).

To examine participants' reactions (level 1) a questionnaire was administered at the end of the program which assessed acceptance of the program and participants' satisfaction.

Concerning level 2 (learning), we conducted a knowledge test at three different times: before the start, after module 2 (knowledge acquisition phase), and after the complete training program. A problem-solving test measured how well participants are able to apply their acquired knowledge to new problems. This problem-solving test was conducted after module 2 (before the transfer phase), and after the training program was finished.

The knowledge test consists of one item for each topic of the knowledge acquisition phase. By choosing three different times of assessment, it is possible to measure the knowledge gain and the learning process of the participants. Moreover, it can be examined, if the content is learned in a sustainable manner and still available several weeks after the content was conveyed. Due to the small sample size, the results of the knowledge tests are analysed by the non-parametric Friedman test for repeated measures. Afterwards, detected differences are tested using the non-parametric Wilcoxon signed-rank test.

The problem-solving test contains 8 items in which all main topics of the training program have to be applied to new problems. In this way it can be tested if participants perform better after completing module 3 and 4 (transfer phase). Since the problem-solving test was conducted only two times the non-parametric Wilcoxon signed-rank test is used for the analysis, as well.

With regard to level 3 (behaviours), interviews were conducted within the participating enterprises 8 weeks after the training program was finished. The interviews concerned the transfer of program contents to the workplace.

Level 4 (results) was not assessed.

4 RESULTS

4.1 Level 1 – Reactions

The results of the questionnaire (scale from 1 (strongly disagree) – 5 (strongly agree)) are:

- The participants appreciated the online-conception ($M = 4.45$; $SD = .69$).
- Participants would participate again in program containing of self-study texts and virtual classroom sessions ($M = 4.45$, $SD = .95$).

- The contents of aquwa were work relevant ($M = 3.80$; $SD = .93$).
- The participants appreciated the instructors supervision during modules 3 and 4 ($M = 4.45$; $SD = .69$).

4.2 Level 2 – Learning

Figure 1 presents the results of the knowledge test at three different times and the problem solving test at two different times. The results are shown in percentage of the maximal possible score.

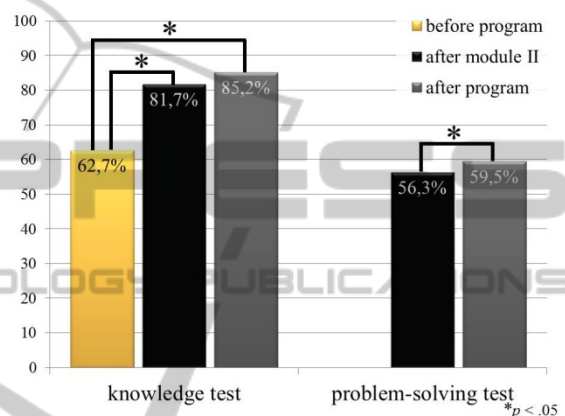


Figure 1: Results of the knowledge test and the problem solving test on three different test times (in %).

By conducting the non-parametric Friedman test a significant overall effect was observed ($\chi^2(2) = 9.30$, $p < .01$). Although, the participants presented a relatively high level of previous knowledge with 61,5% of the maximal score, the subsequent Wilcoxon signed rank test revealed a significant increase of knowledge after module 2 to 81,8% of the maximal score ($W_s = 2.04$; $p = .03$). Six weeks later, participants were still at the same knowledge level (85,2%), no significant difference could be observed ($W_s = 1.07$; $p = .50$). This result is completely in line with expectations that the increase of knowledge took place primarily in the knowledge acquisition phase (module 1 and 2).

For the problem-solving test two different test times were examined. The performance in applying the gained knowledge after module 4 was 9,85% higher than after module 2. The Wilcoxon signed-rank test revealed that the difference is statistically significant ($W_s = 2.37$; $p = .02$). The result confirmed the hypothesis that the ability of applying the before learned principles and methods could be improved after the transfer phase (module 3 and 4).

4.3 Level 3 – Behaviour

The interviews for investigating if the contents were transferred into the participants' workplace were conducted September 2012. The interviews lasted from 10 to 20 minutes. Nine of the 11 participants could be included. Participants' answers showed that

- eight respondents (89%) reported changes in their daily work due to their aquwa participation;
- five interviewees (56%) already realized an informal learning opportunity at their workplace after finishing the course (four of them were implemented very successfully; one professional did not complete the implementation yet);
- the other four former participants (44%) stated that there was not enough time in addition to their normal work volume to implement a learning opportunity.

5 CONCLUSIONS

All in all the results suggest that the postgraduate training program aquwa is a very successful e-learning program.

We were able to foster informal learning at the workplace. We tackled the problem of unsystematic knowledge exchange in SMEs successfully by providing professional with possible didactical approaches and methods for independently designing informal learning opportunities. Furthermore, this further education course took place completely online-based via an e-learning platform and meetings in a virtual classroom. We hold the view that neither the self-studying of texts via the platform, nor the trainings in the virtual classroom would have been as effective as the combination of these two elements. In this way the participants were independent and had full responsibility for their learning investment while having at the same time a clear structure, deadlines and contact persons in case of questions. Despite some technical problems, the knowledge acquisition phase had been completed successfully by the participants. In addition, six weeks after the phase where principles and methods were emphasized no loss in knowledge gain could be observed. This might be because participants needed to use the acquired knowledge afterwards in exercises and designing a learning opportunity. The problem solving test revealed that these activities in module 3

and 4 are effective in fostering the ability to apply the previous acquired knowledge.

The overarching goal for a further education course is to influence attitudes and behaviour at the workplace. But ensuring such transfer is difficult. In the case of the postgraduate training program aquwa, the goal was to improve knowledge exchange by qualifying professionals for installing appropriate learning opportunities in their companies. It is a great success that 56% of the interviewed persons reported the realisation of an informal learning opportunity. However, it also shows that it is necessary in further education courses to show and guide participants in applying the gained knowledge.

REFERENCES

- Desouza, K. C. (2003). Facilitating tacit knowledge exchange. *Communication of the ACM*, 46 (6), 85-88.
- Eraut, M. (2004). Informal learning in the workplace. *Studies in Continuing Education*, 26 (2), 247-273.
- Kirkpatrick, D. L. (1994). *Evaluating Training Programs*. San Francisco: Berrett-Koehler Publishers.
- Kyndt, E., Dochy, F., & Nijs, H. (2009). Learning conditions for non-formal and informal workplace learning. *Journal of Workplace Learning*, 21(5), 369-383.
- Lenske, W. & Werner, D. (2009). Umfang, Kosten und Trends der betrieblichen Weiterbildung – Ergebnisse der IW-Weiterbildungserhebung 2008. *IW-Trends* 2009/1.
- Leslie, B., Aring, M., & Brand, B. (1997). Informal learning: The new frontier of employee and organizational development. *Economic Development Review*, 15(4), 12-18.
- Merrill, M. D. (2002). First principles of instruction. *Educational Technology Research and Development*, 50(3), 43-59.
- Overwien, B. (2005). Stichwort: Informelles Lernen. In *Zeitschrift für Erziehungswissenschaft*, 3, 339-359.
- Stern, E. & Sommerlad, E. (1999). *Workplace learning, culture and performance*. London: Institute of Personnel and Development.
- Tynjälä, P. (2008). Perspectives into learning at the workplace. *Educational Research Review*, 3(2), 130-154.
- Van Merriënboer, J.J.G., Kirschner, P., & Kester, L. (2003). Taking the load off a learner's mind: Instructional design for complex learning. *Educational Psychologist*, 38(1), 5-13.