Double Loop Learning in Work based Settings

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Abstract. Students in work based settings gain access to a vast amount of knowledge. This workshop contribution introduces micro articles as a tool to make practical knowledge persistent. Micro articles are used to establish double loop learning in the sense that the learners not only consume but also provide learning objects. The aspired effects are a deeper reflection for the original learner as well as an increase in the available knowledge that is also interesting for other learners.

Keywords: Double Loop Learning, Communities of Practise, Knowledge Management, Micro Articles, Practise or Work Based Learning.

1 Introduction

Learning a profession is much more for a student than the mere memorization of facts. [1], [2], [3] Thus learning a profession can only take place within this profession. However, a pure being within a profession will normally not form experts, but people who are only experienced but do not possess a deep expertise. [3], [4] Our general research is therefore about navigating between the faults of a too theoretical and a too little grounded education and about minimizing the suboptimal. One aspect of this research is the feedback that students in work based settings can give on common theories and their application to practical problems and how this feedback can be used by other learners. To foster this information exchange we developed tools like e.g. an e-journal which can be found at http://www.e-journal-of-pbr.info. Yet we found that the format of an academic journal attracts more the academic writer and not primarily the practical user of academic concepts.

Therefore we thought about ways to establish structured but easy to use communication tools which learners in work based settings can use to share information about the application, the advantages and the limitations of academic concepts. This workshop contribution reports our first evaluation of so called micro articles which are a concise and structured means of communication and thus promising to be used in work based settings.

2 Double Loop Learning in Work based Settings

2.1 Double loop learning

The term double loop learning is often associated with organizational learning theory. In this meaning it stands for the capability of an organization not only to develop itself within a given set of assumptions [5], [6], e.g. 'the customer is the king' and to learn in order to cope with these but also to continually challenge its assumptions, e.g. 'is it not the major shareholder who is the real king'?

Our understanding of double loop learning is different from this meaning, because the object of learning is not organizational assumptions but theoretical concepts and their application. Similar is the idea of a learning loop where learning leads not only to a change of the learner but also to a change of the learning objects.

Double loop learning is often utilized to as a means of reflection for the learner. Reflection plays a major role especially in cycle based learning theories, because it promotes the learner from pure experience to deeper understanding in work based settings. [7], [8]

Even though we believe that the critical reflection of concepts is of vital importance it is only one aspect of double loop learning in our understanding. Besides the aspired effect of reflection for the learner double loop learning has also to produce new learning objects which are useful for other learners. It still has to be researched where these two objectives of double loop learning can be contradictory to each other.

Double loop learning is also close to the concept of so called Communities of Practise. In such a community of practice peers exchange their learning experiences. The quality assurance is also established on a peer base and the learning objects are of a rather free format. [9], [10]

The aspect of peer-exchange is also important for double loop learning in our understanding. However, our target group of students in higher education still requires a lecturer. Even though this lecturer has a different role, e.g. named by the buzzword facilitator there still needs to be somebody responsible for the learning objects especially when these learning objects are formally assessed. This role and its inheriting contradictions pose an open research issue, too.

2.2 Work based settings

Work can be either paid or unpaid work. It can be work for the sake of the work itself or it can be work for the sake of learning a profession or most probably an intermediate point somewhere in this continuum. [11] Some students have contracts with companies and thus are paid. However, the pay varies and some might even get no pay at all. The same is true for the position in the work-learning-continuum. Some students enter data and some are co-working on major strategy consulting projects.
In our understanding all of this is a work based setting. We see that learning can arise in all of these situations. But again, the different natures of work based settings and their complex relationship with the learning have to be researched further.

When a student applies theory to a real-world problem she or he will most probably encounter a theory-practise-conflict. The nature of this conflict is far from being trivial and the conflict itself is an important aspect of learning. [12]

2.3 Our approach to double loop learning in work based settings

Figure 1 summarizes our approach. In a single loop learning the learning objectives, resp. learning objects are set from outside the loop and the learner can only adopt to this objectives especially after he received a feedback in an examination. If he finds the learning objectives wrong or inappropriate or useless – which can especially occur in a work based setting in form of a theory-practice-conflict – the experience cannot be used by other learners; this knowledge is lost.
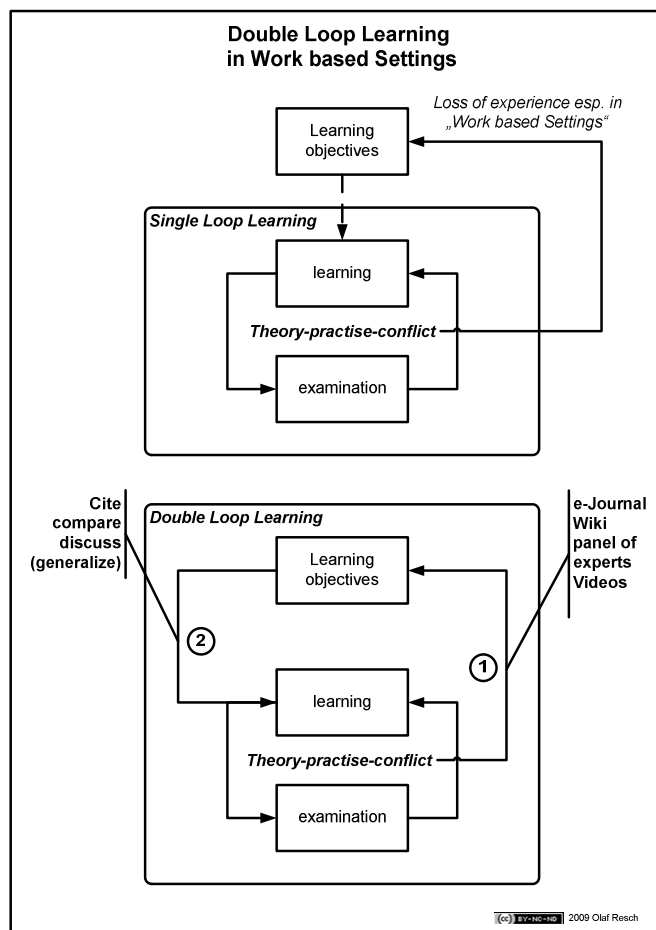

Fig. 1. Double Loop Learning in Work based Settings overview.

In a double loop learning the experience is fed back into the loop, alters the learning objectives and can thus be used by others. Some example tools to communicate the experience are the already mentioned and in use e-journal, wikis, a panel of experts and videos. All have their advantages and disadvantages.

The experience of learners can e.g. be used by citing it, by comparing it to own experience or by using it in discussions. Another interesting, but difficult to accomplish utilisation of this individual experience would be to generalize it in form of grounded theories. Invisible, but of vital importance is the lecturer, resp. facilitator especially if the learning is not purely informal, but leads to an assessment. Next we will describe micro articles as one tool to reflect individual experience and to make this knowledge persistent.

3 Micro Articles

Willke assumes that someone will understand and handle problems well, if he or she writes an article about that. But many people have not the time and the know-how for writing und publishing a professional article. Consequently, Willke developed in 1996 the instrument MicroArt (short form of micro article) which is a radically reduced article that only contains the core of the relevant expertise. [13] He defines micro article as a documented description of a learning experience like a compressed case study. [14] But the micro article does not only provide data and information, but also the experiences. The documentation of the problem as a story enables the reader to understand the context much better. That's why the micro article acts as a teaching and learning material for focused learning in a group. [14]

Willke has consciously chosen the name "micro article" to show the similarity to scientific articles. It is a hybrid of a file card and a long article. [13] Similar to the scientific articles micro articles contain all six steps of the knowledge management [14]:

1. The author should learn, have an idea or develop a conception. He must generate knowledge.
2. The author has to think about his expertise, so that he can write it down.
3. He should formulate it well, so that others can understand the written text.
4. He must publish his article. That means he has to make it accessible to an interested audience.
5. The article's success depends on which persons and how many persons have read and used it. The quotations are the common method of counting.
6. A written, published and read article should not stand alone. It is an element of a continuously revision of knowledge. The use of a micro article gives reason to criticism and new suggestions.

3.1 Micro article structure

The learning experience is summarized on one page. Micro articles have a clear structure. So it is ensured that the author and reader can understand well the written experience. Figure 2 shows a possible basic structure of a micro article.
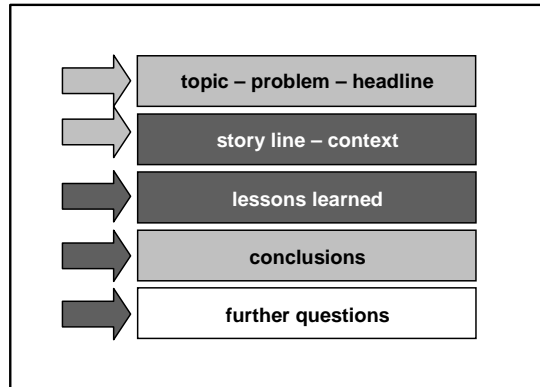
→	**topic – problem – headline**
→	**story line – context**
→	**lessons learned**
→	**conclusions**
→	**further questions**

Fig. 2. Basic structure of a micro article according to Willke

At the beginning the topic is mentioned in a form of a concise header. In particular, a significant header helps to orientate better. [15] Then the story is telling. It does not only impart hard facts but also emotions. That helps the reader to understand the problem. The micro article gives the possibility to connect the knowledge in the story with the own experiences. The connection between external information and the own experiences makes it possible to generate new knowledge and to establish the important knowledge transfer. [14] Beside the story the third step "lessons learned" is very important. Here, the story behind the story should be shown. That means the sense of the story. At this step you do not have to draw a conclusion, but you have to look into the core of the whole story. [14] Drawing a conclusion should be done in the next step: What should be done differently at the next time? What are the consequences of the lessons learned for acting in the future? Finally, further questions as a thought-provoking impulse are formulated: What can help in the future to solve or to avoid the problem? [15]

Micro articles have a basic structure, but every group who is using micro articles as a knowledge management tool should agree on one style and a certain form, that is working best. [13] One possibility is a standardized style sheet, for instance a specifically adapted template of an electronic presentation or data software which shows all micro articles' elements. [13] But micro articles in a multimedia-based form (e.g. a short or documentation film) are possible, too. This type of publishing is more complex but more effective than a written text. [13] Finally, it is a question, which rules are found for the collective use. [13]

3.2   Micro articles' use

Micro articles can be used in companies or other organisations as well as in universities. As already mentioned, micro articles are produced in written (often digital) and in multimedia-based form, for example drafts or short films. For instance all learning experiences of a day, of a working week, of a project, of a meeting, of a book or a seminar can be summarized in a micro article and be published over an

internal network (e.g. intranet) to that everyone has an access. [16] If the micro articles are frequently published, a documented learning story will develop from a series of micro articles that gives further possibilities: Development of an own knowledge database, exchange and discussion about micro articles between all group members, increase the precision, continuity and speed of individual and collective learning processes, documentation of lessons learned.

3.3 Micro articles' advantages

Micro articles are useful for the author as well as for the reader. The knowledge can be explained and shared, because micro articles are systematically elaborated. [15] The author is forced to think about certain problems, to write it down in detail, to draw conclusions and to find solutions. Furthermore, the author learns to document, systemise and to combine his own knowledge story as well as to develop his own field of knowledge. [14] Moreover, micro articles are attractive to the so called knowledge worker, because they have the possibility in spite of a lack of time to write down continuously all learning experience of their daily work. In contrast to professional articles you do not need so much time to write a micro article. [13] A further use is that the "communities of practice" (e.g. teams, project groups) can deal with a professional subject on the basis of the existing micro articles. The discussions can be systemised on the basis of the existing micro articles and directed to certain subjects. The authors can learn other perspectives and thereby generate new knowledge. [14] But the micro articles should not be used only one time. [14] If micro articles are systematically filed in the organisation they will develop to an invaluable knowledge management instrument. [15]

3.4 Difficulties

On the one hand the micro article is an efficient tool, on the other hand a time-consuming and expensive instrument. The main difficulty is that you have to publish them continuously to generate successfully the knowledge in the organisation. Therefore the organisation must provide time resources. That means that you need one time a week a half hour for writing a micro article. [17] But many people do not take this time. The authors' self-discipline weakens after a while. [13] Furthermore, the authors have to practice writing a micro article. So it is not simple to write them. They need a strong will and staying power to learn the right writing method. That's why writing micro articles requires an initial investment which is not self-evident. [14] The organisation has to lay certain foundations, so that the use of micro articles will be successful. You need the organisational support and the embedding of the work with micro articles. The company must create rules, how the collective use of micro articles should be organised. [13] Finally, it is important that the tool „micro article" is established in an organisation so that it can successfully develop. The organisation has to support the exchange in form of mutual reading, using and giving comments. It should develop and update continuously a database of micro articles to that every member has an access. [13] Consequently, the system must be able to demand and support the knowledge transfer.

4   Survey on the usage of micro articles amongst students in work based settings

We conducted qualitative interviews with a group of students who used and submitted micro articles as part of writing their thesis. All of them were in a work based setting while preparing their thesis. Here are the major results:

— The students did not know micro articles before and thus need a clear guidance and explanation of the goals and the way of use.

As positive aspects were identified:

— The shortness and the clear structure are seen as strengths.
— Furthermore, the micro article helps to arrange his or her ideas and to structure the process.
— The main hypotheses can be pointed out as a result.
— The micro articles summarize the main information and provide it for the general public.
— In addition, you can see the topic from different points of view and can summarize it accordingly.
— From the user's view other advantages of the tool are identified. The micro article can give the reader a fast overview of the topic. It provides a higher clarity. So it facilitates the access to an unknown topic.
— Because of the article's shortness the reader can quickly realize the main points and recognize, if the topic is relevant for him. The time saving is another strength of micro articles. Micro articles are limited to the essential, so that you can quickly comprehend the content and quickly understand the context. Because of the information overload we have less time to read long scientific papers.
— To sum up, micro articles are useful for the first acquisition of information. Besides that, some of the respondents think that it is important to recognize how other people work and which tools and methods they use. Finally, the students think that the tool micro article is useful for making complex topics understandable for the reader.

As weakness were identified:

— Micro articles cannot impart deep information about a subject, because explanatory statements and derivations are missing as well as certain facts are not completely explained to get an overall understanding about the topic. So the user reverts to long scientific papers, because on the one hand they provide more facts and describe the phenomenon in more detail as it is possible in a micro article, on the other hand they show the connections and explain them in more details.
— Furthermore, the respondents have discovered that someone who has not the specific knowledge about a certain subject can probably misunderstand the

content, because the content is rather compacted and published without any explanations.
— Because of the micro article's weaknesses the tool can complement the long academic papers but cannot replace them. The long scientific papers provide the basis for micro articles. Without them a summary and systematical description of the conclusions in form of a micro article are not possible.

All of the interviewees think the tool micro article becomes more important in the future. The micro article can be established as the summary of long scientific papers. The students will use the tool with some reservations in the future, because they are interested in providing their knowledge to others.

5 Summary

We explained the nature of our research and related our understanding of Double Loop Learning in Work based Settings to other meanings of this concept. We also set out that the overall subject is still undiscovered in many aspects. Micro articles were introduced as a pragmatic enabler tool. However, a survey on its use amongst students in work based settings revealed that micro articles can only be one building brick to establish double loop learning.

Additional research and development must ease the use of micro articles and discover the dependencies with other tools like e.g. academic journals. Furthermore, additional tools like e.g. videos should be considered and researched. Besides tools, also the role or the lecturer must be analyzed and shaped. There is still a long way to a fully accepted, integrated and assessable double loop learning in work based settings.

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