Guiding Articulation for Learning at Work: A Case of Reflection

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Abstract. In this paper, we present work on implementing articulation support and means for guiding users for integrating collaborative learning and work. We present a case from the MIRROR project, in which we developed and piloted a tool supporting reflection as a means for learning at work. From the insights of this study, we derive a concept of scaffolding which prompts informal learning if the reflection of work practices is not institutionalized.

1   Collaborative Learning and Work: United, yet apart?

Collaborative work and learning have considerable overlaps in terms of methods used to analyze and design learning and work as well as in tools and concepts to support them. This is not grounded in the need for support of group work, but also because (continuous) learning is an integral part of work [1–3].

Despite these overlaps communities such as CSCL, TEL and CSCW still develop tools and concepts in parallel without making systematic use of conceptual overlaps. In this paper, we focus on the challenges of integrating learning and support of collaborative work with respect to articulation and guidance for users:

- **Articulation [4]:** To learn and work together, experiences, knowledge, rationales and perspectives need to be verbalized and exchanged [5].
- **Guidance, scaffolding and awareness:** Both in collaborative learning and work, there has been a lot of research about how to support them and whether this support needs strict guidance, optional scaffolds or just the possibility of mutual awareness for freely controlled coordination [6, 7].

The challenge addressed in this paper is how to implement these concepts to *integrate working and learning*, that is, how to embed learning processes meaningfully in the constraints imposed by workplaces and vice versa in order to make learning at work happen. We argue that this has to be done by combining organizational measures and technical means into socio-technical processes. This paper illustrates this argument by presenting a case from support of collaborative reflection as a learning mechanism at work taken from ongoing work in the MIRROR research project.

2   An Example Case: Supporting Collaborative Reflection at Work

Reflection can be understood as a process of informal learning at work [1]. It includes three steps: returning to experiences, re-evaluating them in the light of current knowledge and deriving insights for the future [8]. Although it is also inves-

tigated in educational settings, reflection can be considered a common and indispensable part of daily work [3, 9]. While individual reflection is a cognitive process, collaborative reflection combines cognitive and social processes, and needs support for articulating and exchanging experiences as well as various perspectives on the same case, and proposals for changes of work practices [10–12].
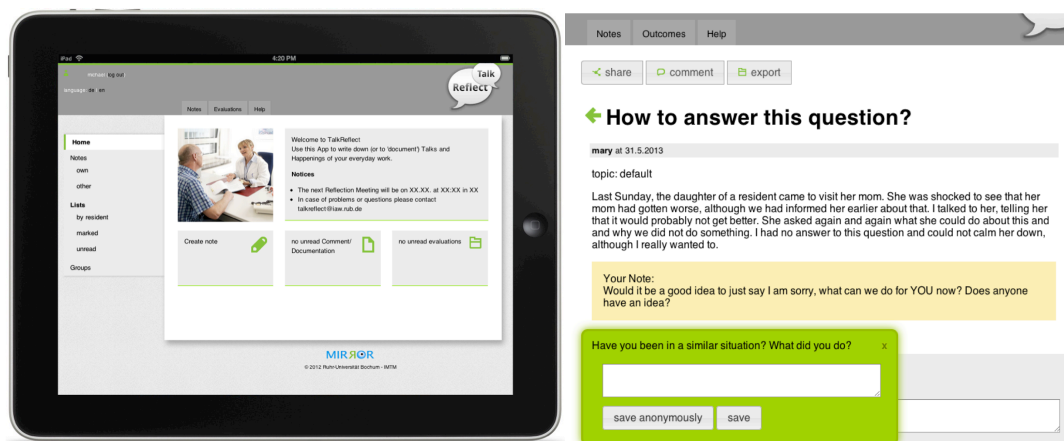

Fig. 1. The Talk Reflection App for collaborative reflection of conversations and interactions.

In our work, we have designed the "Talk Reflection App" [12] as a tool for the collaborative reflection of conversations and other social interaction taking place at work – such situations can be emotionally stressful if, for example, bad news have to be conveyed or conflicts cannot be solved. Dealing professionally with these stressing challenges needs experience with them, an understanding of these situations beyond what can be acquired from training and strategies to conduct them. With the Talk Reflection App, workers can document what has happened in such situations, assess their documented experiences with respect to feelings and other aspects, and they can share them with their colleagues (see **Fig. 1**). Subsequently, colleagues can make comments on each other's documented experiences. For example, they can propose strategies of how to cope with a stressful conversation or similar situations as well as discuss and agree on certain changes to be made, which are documented in the tool (see Prilla et al. 2012 for more details on the app). This enables workers to reflect together on situations relevant in their work, and to redesign this work according to their needs [13].

3   Structuring Collaborative Learning at Work: Balancing between Scripting and Awareness

The Talk Reflection App pursues the implementation of processes of collaborative learning, which are intertwined with a direct feedback as it is provided by carrying out tasks during work. In particular people can directly realize the effect of changed work practices and make them again a subject of collaborative reflection. However, establishing the usage of the app has to overcome problems with

the adoption of the tool and with realizing its potential benefits: In initial pilots, the app was predominantly used for documenting and sharing experiences, while features for collaboration such as comments to exchange understanding and perspectives related to shared experiences and the documentation of outcome to sustain and share results from reflection, were used much less [14]. We attribute this to two constraints of integrating learning and work:

1. Establishing *collaborative learning at work* requires the design and implementation of *socio-technical processes* in which technology can support an evolution of existing practices and communication structures but not replace them. A typical instance of this practices is that documenting experiences and sharing is employed by workers to remember cases and make others aware of them, while a large part of the reflective interaction will happen when people meet each other during work, e.g., in meetings or on the hallway.

2. Reflection is a kind of meta-cognition which is in many cases not initiated by the structure of the task itself, or by a teacher or facilitator. This a clear difference to learning at schools or universities where tasks and problems are designed or introduced to trigger reflection. Since using tools such as the Talk Reflection App is not initiated by the actual work task itself, diverging tendencies can be observed: On the level of their attitude, people generally agree that reflecting with others on past experiences can improve their work practice. However, during daily work routines they usually do not switch from their primary work task to the usage of tools with respect to collaborative reflection and learning. This is especially true for reflection on positive experiences, as such good practice does not produce the pressure for change that problems cause.

We could see these effects when we piloted the Talk Reflection App in practice. For the first constraint, usage data of the app showed a low degree of collaborative reflection on shared content in the app. When we observed meetings among staff and interviewed them, however, we were reported many situations in which they had used content in the app to start reflective conversations and also came up with ideas to change their work. In general, this means that the app already had an impact on reflective practice. However, comments and results are only known to people being physically present during these interactions.

For the second issue, people often reported they did not have the time to use the app or had not known what to write for example in comments. However, we also could observe that when people understood how the app could support their work, they started to use it more frequently. In one case, caregivers in a home for elderly people even used the app frequently for this reason although their manager had only allowed them to do so during their free time, e.g., in breaks and before their shift. The challenge therefore is to motivate people initially to use the app in order to enable them to perceive the value it can have for their work.

To deal with these constraints, we designed a concept of implementing a non-obtrusive guidance –as it is offered via scaffolding [15]– into the socio-technical support of collaborative reflection with the Talk Reflection App. The core mech-

anism of this scaffold is to display prompts from time to time (with a flexible yet fixed ratio) which actively request actions of the users (e.g., "Did you have a recent conversation? Would you like to document it?") or with questions to be answered (e.g., "Have you been in a similar situation? What did you do?"). The prompts are related to a model of possible processes which consist of core activities such as capturing data, articulation, or individual and collaborative reflection [14]. **Fig. 1** (right) shows a prompt asking for comparable situations if a user looks at an experience documented and shared by a colleague. The displaying of prompts can be adapted to the behavior of the users and to the course of adopting the reflection support: At the beginning, prompting can happen frequently to offer a relatively strict guidance; after a while it can fade out and the triggering of reflection relies on the users' awareness of others' documentation and articulation. Besides supporting reflection in a more contextual manner, this may also avoid people becoming annoyed by too many prompts. A central question in upcoming work on intertwining CSCW, CSCL and TEL will have to deal with scaffolds that (partly) replace teachers or facilitators and initiate reflection, giving learning results a sustaining impact on work practice by providing appropriate prompts.

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