

# Coflection – Combining Mutual Support and Facilitation in Technology Enhanced Learning

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**Abstract.** Coaching and reflection are established methods for learning from experiences and peer support at work. They support people with different means: While coaching is a rather formal, planned, structured and systematic process, reflection is rather informal, spontaneous and emergent. Despite these differences, coaching and reflection may complement each other. This helps to overcome barriers of the respective other method and closes a gap between formal-systematic and informal-self-organized approaches of learning at work. In this paper we ask how this complement can be supported by tools and describe an intertwined concept of reflection and coaching called “coflection”. We identify challenges associated with this concept, we present a prototype and we explain how the concept may solve problems at work by using real-world scenarios. The paper contributes to TEL by providing a concept that enables transitions between formal and informal learning.

**Keywords:** Reflection · Coaching · Coflection

## 1 Introduction

In modern workplaces with changing conditions and high requirements methods of mutually facilitating learning from experiences such as learning from others and peer support are important aspects of workplace learning [1, 2]: Peers are used to and efficient in supporting each other in coping with problems or successful task completion, dealing with changes and developing new practices. Similar observations have been made for workers facilitating the learning of clients [3].

Concerning self-directed learning, in which workers support each other (that is, in which they facilitate each others’ learning), there are challenges to be overcome in many workplaces. First, in many workplaces there is little or no active (tool) support for non-formal and self-directed learning, which is often supposed to happen in social interaction [1, 4]. Second, even if methods for informal learning are used, they are often not well connected and cover (only) specific learning, group processes and purposes. It is then up to humans knowledgeable about these methods to choose and apply them in practice. Third, there is a need to integrate methods and tools into everyday work.

For example, people need to find the time required for (synchronous) coaching sessions and to continuously reflect despite other pressuring tasks [5].

Two recently discussed means for learning from each other and peer support are **coaching and reflection**. Coaching can be defined as a process in which experts (coaches) lead a client from a problem setting to possible solutions and change. This is accomplished by fostering self-directed learning through asking the right questions [6]. Reflection is a process in which one or more individuals engage in re-assessing experiences in order to turn these experience into learning [7, 8]. There are differences (e.g., formality in coaching vs. flexibility in reflection) and similarities (e.g., learning from experiences) between these methods. In this paper we argue that these two methods can complement each other and that there is potential in combining coaching and reflection at work. We then describe how tools can support this combination and how this closes gaps in existing support for peer groups helping each other at work.

Our work is in line with existing work on supporting group learning and learning at work. For example, Dillenbourg et al. [9] have argued that rather than discussing whether formal or informal processes and guided or free communication provide best support for complex learning situation we should be open for transitions between these means to support learning. Likewise Eraut [10] describes a combination of mutual consultation, mentoring and informal relationships to be beneficial for people to actively engage in thinking and talking about their knowledge at work. Adding to this work in this paper we describe how concrete methods and tools for learning can be combined, and how tool support for such a combination can be provided.

## 2 Technology Enhanced Coaching and Reflection

Coaching and reflection differ in certain aspects, but share the same intention, learning matter and triggers for learning. Below we summarize existing work on support for coaching and reflection and analyse differences and synergies between them.

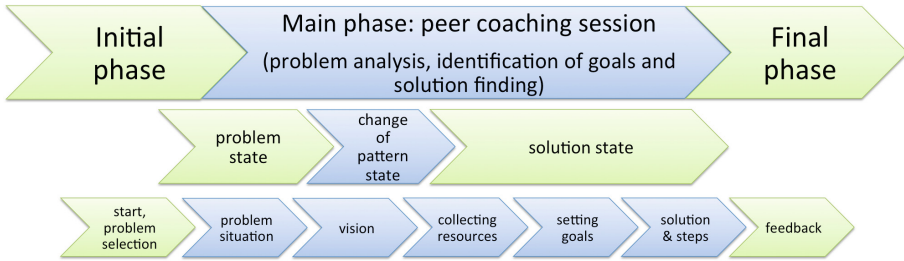
### 2.1 Supporting (Peer) Coaching

Coaching can be defined as structured communication process in which a coach assists a client to identify his or her set of goals to improve professional performance and personal satisfaction. This is accomplished by fostering the ongoing self-directed learning and personal growth through asking the right questions [6]. It is a systematic, solution-focused support of solving problems and improving self-reflection, as well as facilitating persons or groups in aware self-transformation and self-development [11]. Coaching often follows a sequence of problem analysis, identification of goals and solution finding<sup>1</sup> (see Fig. 1), and is organized in multiple sessions.

Besides the most common type of coaching, in which a (professional) coach supports a client, there are also social types of coaching. Among those, **peer coaching** “[...] refers to a specific form of coaching carried out among colleagues. The members

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<sup>1</sup> Sometimes this is done in different order, e.g. in the GROW-model by [12].



**Fig. 1.** Peer coaching process based on typical coaching processes (top) and desired self-directed learning steps (middle), broken down into steps conducted by peers (bottom).

of the group take turns in adopting the role of coach and thus provide coaching to each other. All members are responsible for the coaching process.” [13]. While preserving the structure and purpose of coaching (see Fig. 1) there is no need for a professional coach in peer coaching. There are three roles taken by the participants:

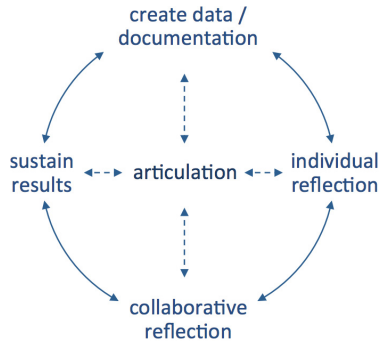
- the **client** or **coachee** brings in the problem to be solved,
- the **moderator** or **peer coaching facilitator** (e.g., a trained employee, no need for a professional coach) takes over a coach-like role and leads the process and
- a group of **advisors** gives advice and feedback to the client.

Referring to tools supporting coaching we use the term “Technology Enhanced Coaching” (TEC), which is not as common as synonyms like E-Coaching, Online Coaching and Virtual Coaching. As TEC is still a young discipline there are only a few technology approaches for supporting coaching, among which we may differentiate between coaching **mediated by** the use of certain technology such as media also available for other purposes (e.g., coaching via video conference) and technology **specifically created for or tailored to** coaching (e.g., supporting certain interventions), thus actively supporting the coaching processes and improving it [14].

## 2.2 Supporting (Collaborative) Reflection

Reflection is a process of returning to past experiences, re-assessing them in the light of current experiences and knowledge and deriving consequences for future behaviour from this assessment [7]. While most research on reflection regards it as an individual, thus cognitive process, there is also a social side of reflection [15]. However, this has only recently been taken up in research on tool support [16–18].

Collaborative reflection differs from individual reflection in that it needs communication among actors reflecting together to exchange experiences, perspectives, ideas and other thoughts. Such processes are cyclic (see Fig. 2): Reflection can usually not be finished in one session but is spread across many (sometimes short) sessions of reflection – the reflection participants decide whether and how to go on with reflecting and what to take away from it [16]. These processes enable a group to reflect together and to create results that transcend individual reflection results, as they enable learning from each other and crafting knowledge from shared experiences [15, 19].



**Fig. 2.** Model of collaborative reflection by [23].

In collaborative reflection participants do not follow a script but share experiences, comment on them and draw conclusions when they find the time to do so. This makes collaborative reflection a flexible process. Involving many people, this process also becomes complex to conduct, as the many different actors need to be coordinated [20], and as synchronous reflection sessions need time and space. Tools for collaborative reflection need to support this communication, make it available to possible collaborators (asynchronously), structure it and sustain content exchange over time [5, 21]. While reflection in face-to-face settings such as meeting is desirable, it often limits the amount of people who can take part in reflection (lowering the likelihood of similar experiences present in a session) and it causes effort to bring together people for a reflection session. Asynchronous exchange and commenting have been found supportive for collaborative reflection at work [22].

Among the scarce approaches of collaborative reflection support, Fleck and Fitzpatrick [23] show how a series of pictures can represent daily activities and trigger reflection in a group, Scott [21] shows how learning portfolios can support collaborative reflection in education and Prilla et al. [22] present a tool in which users can write down, share and reflect on experiences. While these approaches show how collaborative reflection can be initiated and supported, they do not provide solutions for challenges such structuring reflective communication to diminish the complexity of collaborative reflection [20] or providing guidance and moderation as in face-to-face collaborative reflection sessions [19, 24]. As an example for solution proposals in this area Davis [24] suggests **prompts** to guide reflection participants to reflective actions, e.g. by providing questions leading to meaningful contributions [22].

### 2.3 Peer Coaching and Collaborative Reflection: Synergies and Comparison

Coaching and reflection share similar purposes, as both are means to better understand practices and work experiences, to learn from them and to improve in future work. Both rely on experiences being shared with other, both have been found to be valuable additions to ordinary learning at work, and both coaching and reflection are usually

triggered by problems and other situations in which people experienced discrepancies from their expectations (including positive discrepancies). Despite these similarities there are many differences such as the formality of the learning process, the model of cooperation and the mode of learning, which are shown in Table 1.

Major differences can be found in the organisation of the process. Coaching provides a clear role division between the learner (client) and the coach (or moderator)<sup>2</sup>, while in collaborative reflection all participants may provide experiences, perspectives and ideas. Therefore, coaching requires at least certain training on the role of a coach, while there is no such need in reflection. Coaching sessions usually follow a certain process (see Fig. 1) and guided communication, including different tools and methods the coach may use to guide clients in the process of understanding. On the contrary, even if moderation of reflection session is recommended to support the coordination of participants [19], structuring collaborative reflection is widely left to participants [20]. Roughly we may thus state that coaching is a more systematic, structured and formal process, while reflection is an emergent, discursive, collective and informal process of crafting knowledge together. This resembles discussions on scaffolding and scripting in learning, in which there are advocates for both ends [9].

**Coaching and reflection in groups** differ in labour division, goals and implementation of the process. Peer coaching is a concept of **cooperative** work, in which participants take different roles and tasks in the coaching process (e.g., supporting the client or being coached) that help to reach the (common) goal of succeeding in the coaching session. For reflection in groups there is no role division and therefore participants **collaborate** (see [25] for a commonly used distinction of cooperative and collaborative processes), meaning that they share the same goal (learning about practices). Therefore, in line with work on media choice [26], coaching processes often rely on synchronous sessions, in which coach(es) and client(s) meet face-to-face or virtually, and as described above, reflection support is often asynchronous [22].

While the differences discussed above separate coaching and reflection from each other they also show the **potential of combining coaching and reflection** to complement each other. In particular, coaching and reflection support can **connect formal and informal processes of learning from work experiences**. Such a combination could help to overcome challenges in both methods, for example the need of co-availability of coach(es) and client(s). Reflection could be used for the many situations in which a coach (or facilitator) is not available or there is no time for a (peer) coaching session, and coaching could be used in processes in which the creation of outcomes needs a more focused approach. Iterating between reflection and coaching may then help to reify both processes. Eraut [1] describes this “balance between support provided by people on the spot (...) and support from a designated mentor or manager” as an ideal combination for practicing and getting closer to expertise.

The potential of combining coaching and reflection is especially present for social ways of coaching and reflection: transitions between peer coaching and collaborative reflection are much smoother than for other combinations: Roles are not as clearly defined and separated in peer coaching as in one-on-one coaching sessions, and the

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<sup>2</sup> Despite this role division no hierarchy must be involved in coaching.

**Table 1.** Differences between concepts (and their implementation) of coaching and reflection.

	Coaching	Reflection
Learning goal	Understanding practice and learning for the future	
Learning matter	Experiences, practices	
Trigger(s)	Problem situation, discrepancy to expectations	
Learning approach	(Rather) Formal, guided	Informal, emergent
Roles in the process	Coach, client (coachee)	Reflection participants (equal)
Interventions in the process	Many tools and interventions for different steps in the process	Questions, moderation of group reflection
Labour division model	Cooperation: Coach provides structure (process expert), client digs into issues (content expert)	Collaboration: All participants engage in reflection on same context
Goal for session	Common goal: Positive outcomes from coaching, capacity to act (but different individual goals)	Shared goal: Learning about same/similar issue(s)
Barriers	Time and personnel (coaches) needed <sup>a</sup>	Time to step back, continuity, integration into daily work
Implementation (technical support)	Synchronous (partly asynchronous, e.g. preparation)	Asynchronous (partly synchronous, e.g. meetings)
Training	Required (role taking)	Not required

<sup>a</sup>Except for self-coaching

degrees of formality in peer coaching and collaborative reflection converge: participants have a higher degree of flexibility and process steering in peer coaching, and a reflection group needs to be guided in order to diminish the complexity caused by many participants reflecting together. Therefore, enabling transitions between (peer) coaching and (collaborative) reflection provides potential to help groups of people working together to flexibly apply the support they need in learning about their work.

### 3 Motivation: The Need for Combining Coaching and Reflection

Below we illustrate the need for and potential of combining coaching and reflection by using two examples from real world cases.

The first example is taken from work with a German hospital, in which (assistant) physicians were supported in learning about conversation with residents of their patients [22]. Talking to relatives often puts young physicians in a stressful situation [27], as they have to convey (bad) news in an emotionally loaded situation. To learn how to conduct these conversations professionally without being stressed needs experiences with such situations, which cannot be acquired only by training [28].

Therefore we created a tool supporting physicians in writing down experiences, sharing them with each other and reflecting on them together by exchanging comments on shared experiences [22]. This worked well for sharing and reflecting on experiences, and participants adopted the tool well for this, but the usage of the tool dropped over time. Asked about this participants told us that while they saw value in exchanging experiences, they felt they needed more systematic support and guidance to derive insights from these experiences for their future work. Using the content they created in the tool in coaching would have been a solution, but neither a coach nor technical support was available.

The second example is taken from a project with European professional employment services (PES), in which employees from a PES organisation were supported in dealing with constant change [29]. As part of strategic shift staff was required to more intensively work together with employers and to motivate clients to take chances of a job even if it is not a perfect fit for them. This turned out to be difficult, as very few members of staff have experiences with these new tasks. There are fixed times allocated to interacting with employers and clients and there is not much time for training. Therefore, there is a need to learn during work from initial experiences and too build good practices. (Peer) coaching was considered to be supportive in these situations and as a continuous offering to staff, but was found not to be feasible: Given number of staff to be coached too many coaches would have been required and there not enough time for synchronous peer coaching groups. To enable exchange and learning from each other outside face-to-face sessions we provided staff with an asynchronous platform for experience exchange and reflective discussions.

The examples above describe a common problem we also found in other cases, which is caused by mutually exclusive needs and constraints such as forming peer groups to understand practices while being bound to fixed time slots, and freely exchanging experiences while needing support in systematically deriving insights from them. In both cases, offering one type of support for learning from experiences led to a lack of support in certain situations. This led us to the *concept of coflection*, which flexibly combines coaching and reflection processes.

## 4 Coflection: Combining Coaching and Reflection

Based on our theoretical and empirical work as outlined above we created the concept of **Coflection**<sup>3</sup> and its prototypical implementation.

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<sup>3</sup> The term “coflection” is used by others to describe a “meta-thinking process by means of which people, together, bend on each other’s thoughts and actions in a conscious way” [30] or “to capture the socially critical nature of the interactions among teachers within professional learning” [31]. However, we use this term as explained above, as it literally stands for our aim to closely intertwine coaching and reflection.

#### 4.1 Combining Coaching and Reflection: Two Conceptual Levels

The coflection concept combines coaching and reflection support on three levels. First, it includes the ability to **combine coaching and reflection on a process level**, meaning that a coaching process can directly follow a reflection process and vice versa. Second, the concepts includes **processes composed from elements of coaching and reflection**, meaning that support for reflection can be used in coaching and vice versa. On a third and meta level coaching and reflection may reinforce each other, but this level is out of scope for this paper.

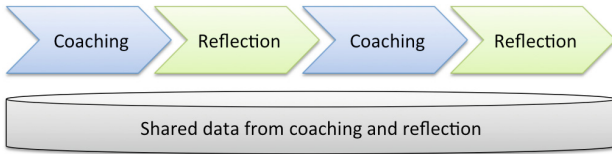
Concerning the first level, tools should be able to support both (collaborative) reflection and (peer) coaching processes to enable users to choose a method suitable for each problem and time. This requires content created during a peer coaching session to be available for follow-up reflection and vice versa. Users may then start collaborative reflection, in which they share experiences and comment on them until they reach a situation in which there is a need for more intensive clarification of the process. They may then negotiate a time to meet as a peer coaching group and use the content created during their reflection to start the coaching process. After that they can use outcomes from coaching for further reflection on the experiences that triggered the peer coaching session. While this level is most obvious from our analysis, it already provides support for different situations (synchronous and guided with coaching, asynchronous and flexible in reflection) to people. In addition, it enables learning from experiences when there is not time or group of (peer) coaches available and allow for more intensive learning sessions when this is the case. To our knowledge and despite its potential this level had not been implemented in tools so far.

Concerning the second level, tools may no more include a distinction between coaching and reflection but offer support in which elements of both processes are closely intertwined. This might include (but is not limited to):

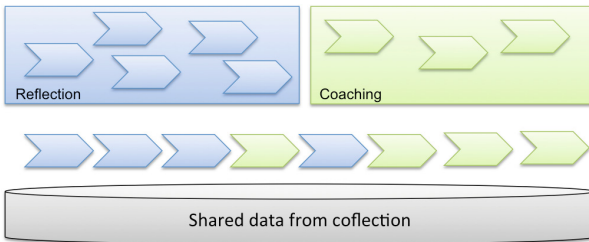
- **Using prompts in coaching sessions**, which ask participants bound to the role of a peer coach or advisor (thus not allowed to provide own experiences) to share similar experiences with the coachee. This may help to create solutions by comparing similar experiences and deriving insights that help beyond single problems.
- **Structuring (collaborative) reflection processes along typical phases from coaching processes**, for example giving participants a timeframe to create comments to clarify the problem in shared experiences and then switching to a phase in which participants are asked to provide solution proposals. This may structure the otherwise flexible reflection process and guide people to create results from it.
- **Switching between situations in which users have special roles (coaching) to situations in which they are equal participants of the process (reflection)**. This offers guidance and support created by (peer) coaches when necessary and provides flexibility and exchange otherwise (Fig. 4).

The implementation of the second coflection level will offer synchronous peer coaching sessions, which are enhanced by the ability to share experiences, and prompts asking participants to comment on experiences (adding reflection features to coaching). It will also allow users to reflect collaboratively and take on roles from coaching in order to structure the support they can give each other. A tool may then either contain





**Fig. 3.** Combined coaching and reflection on a process level



**Fig. 4.** Processes composed from elements of coaching and reflection

pre-defined collection setups (procedures) or allow users to configure their own process. The user no more needs to differentiate between coaching and reflection but uses a process that fits the constraints and culture of the workplace best.

On a third level, which will not be described in detail, coaching may support people in developing skills to reflect together (coaching to support reflection) and collaborative reflection can be used by peers to learn from peer coaching session. This forms a meta-level of reinforcing reflection by coaching and the other way round.

**4.2 A Prototype for Collection Support: Coaching and Reflection in a Community of Practice**

To investigate the feasibility and effects of combining coaching and reflection in practice the collection concept was integrated into a community of practice platform (see [32] and Fig. 5). The platform was built to support practitioners in employment services in dealing with legal, economic and ethical changes in their work.

Figure 5 exemplifies how reflection is supported in the community platform: Besides common features used in other community platforms as well (e.g., the forum structure shown on the left side, tags available for contributions etc.) the platform provides the user with reflection prompts (see no. 1 on the right side of Fig. 5), which stimulate collaborative reflection (e.g. “Have you ever been in a similar situation” as a stimulus for sharing and comparing similar experiences in Fig. 5).

In addition to reflection features the platform provides a (peer) coaching room, which is being developed at the time of writing this paper. It is designed to be a separate area in the platform, enabling synchronous exchange between peer coaching group members. Features include taking and switching roles as well as guidance in the

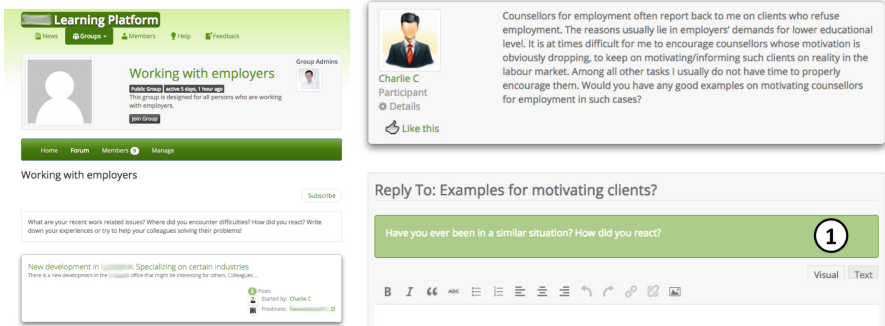


Fig. 5. Prototype for coflection in a community of practice platform.

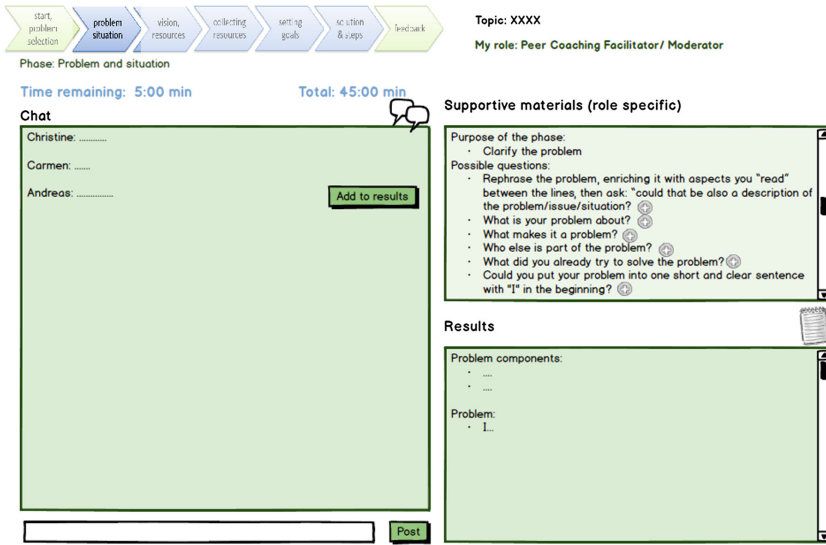
peer coaching process, including the time left for phases and what to do in the current and next phases. Content from threads created in collaborative reflection as shown in Fig. 5 can be transferred (linked) to the peer coaching room, and content created in the peer coaching room can be exported to a thread in the collaborative reflection area. Figure 6 shows the design of the peer coaching room.

The platform will be used to investigate the feasibility and effect of coflection support in practice. At the time of writing it is rolled out for smaller user groups in European professional employment service agencies. It will initially focus on the first conceptual level of coflection, but will be extended to support the second level in further development. For example, the supportive material in the peer coaching room will be complemented with explicit reflection prompts as shown in Fig. 5 to foster reflection between and in coaching sessions.

### 4.3 Envisioning Coflection in Practice: Supporting the Examples

Applying the concept of coflection to the scenarios described above shows that the concept provides a flexible approach that creates value for peer-to-peer support and learning at work. Taking the first example coflection could be a supportive element to go deeper into certain problem situations by making use of peer coaching methods. In this case, physicians using a coflection tool could decide to initiate a coaching session after reflection and discuss situations in which it was especially hard to talk to the relatives. This can help them to find out what made it hard and what could be done to improve this situation, providing the guidance and systematic approach the physicians asked for in our work with them. Using the outcomes of peer coaching in further reflection could then connect peer coaching activities and collaborative reflection into a cycle of mutual support for finding out about and improving challenges at work.

In the second example our approach would be the solution to have a mixture between asynchronous and synchronous exchange between peers. Rather than having trouble in organising peer coaching session frequently PES practitioners could use asynchronous collaborative reflection between coaching sessions to support the problem solving process. Using coflection support would provide them merely with the



The peer coaching facilitator/moderator asks the client about the problem. The result of this phase is a clear definition of the problem by the client beginning with "I".

Fig. 6. Prototype for the peer coaching room.

choice of whether to meet synchronously or to exchange content asynchronously. This could increase support for the person searching a solution and support learning how to do peer coaching, which can then be used in the interaction with clients.

## 5 Challenges for Coflection: Socio-Technical Support Needed

During our work on the concept and prototype of coflection we identified certain challenges that need to be overcome in order to offer coflection to learners in organisations. It is a commonality to all of these challenges that they cannot be met solely by technology, but need to be aligned with individual and social activities.

### 5.1 Facilitation and Scaffolding Support: Balancing Structure and Freedom

Concerning **facilitation and scaffolding support** there is a gap that needs to be overcome: As described activities in (peer) coaching are usually carried out by different roles. This needs awareness and structure for activities needed in certain phases. In reflection a facilitator or tool may prompt users with questions that make reflection more likely, but there is no pre-structured process when this needs to happen. This raises at least two requirements for the provision of scaffolding support: For coflection on level 1 there is a need for users to switch between pre-structured and open processes when switching from coaching to reflection support and vice versa. This has to be communicated to the user. “Process change bumps” as described by [3], which provide

awareness and offer distinct change actions between processes, may help to facilitate this switching. Second, on level 2 of our coflection concept there is a need to find a balance between structure and freedom in scaffolding that enables different degrees of blending coaching and reflection support (cf. [33]). Keeping in mind that such support may be provided by human facilitators *or* features in a tool, there is a need to recognize the type of process learners are engaged in order to adapt the scaffolding feature or to propose means for structuring the process to a human facilitator.

## 5.2 Transitions Between Coaching and Reflection: Time, Groups and Content

Another challenge can be found in creating transitions between the temporal and groups structures of coaching and reflection. First, there is a need to create **transitions between synchronous (coaching) and asynchronous (reflection) activities**. Second, there is a need to **combine (smaller) peer coaching groups and the (wider) audience in a reflection community**. Allowing users of coflection tools to smoothly switch between synchronous and asynchronous activities as described by [34] is key to overcome this challenge. The transition between a large community and the small coaching (peer) group, which has been described by Stahl [35] as a challenge, needs to enable user to keep a group identity while interacting with a wider audience.

Both of these needs are closely connected to the challenge of **making available and pre-processing the content** created in coaching or reflection for the respective other method. This needs activities of pre- and post-processing content and making it available for later usage that are known as “**gardening**” in other contexts of learning and collaboration [36]. We assume that automatic content processing such as creating transcripts and summaries of discussions cannot account for these actions alone, but need to be (at least) complemented by humans taking over the role of a gardener.

## 5.3 Designing Coflection Processes: Pre-structuring and Meta-Design

A major challenge in implementing coflection in practice is the **design of coflection processes**, that is, how much reflection to include in coaching and vice versa. There are different ways of providing coflection support to users, including pre-defined processes that provide some of the enhancements described in Sect. 4.1 or leaving the choice to the user. The former would need context detection and recognition in order to provide a process that suits the needs to the learning process intended by the users. The latter is a case of meta-design [37], in which systems are designed in a way that users can design processes and interaction. For coflection this would mean to enable users in combining coaching and reflection flexibly and on the fly if they encounter a need for (further or different) support. Successful combinations of these features may then be used by others as well.

### 5.4 The Need for Socio-Technical Solutions

As can be seen from the challenges described above they afford socio-technical solutions that combine processes of interaction and organisation with technical support. Further work will be dedicated to exploring how these challenges can be met in practice and how to successfully implement colection in practice. Besides these challenges the question remains whether and how to prepare users for the application of colection in practice. For reflection there is hardly any need of training [22], but the roles and process structure integral to peer coaching make training necessary. As colection combines both methods and adds complexity by leaving the choice of which method to apply when to its users we assume that it therefore needs additional support and training. This will be subject to further investigation.

## 6 Conclusion

In this paper we have presented an approach of combining coaching and reflection, showing how these methods might complement each other in a concept we named “colection”. We consider colection to bridge the gap between informal and formal, structured and unstructured, facilitator-driven and self-regulated as well as synchronous and asynchronous support for learning at work.

Our work contributes to the body of work in the TEL community by combining reflective learning, which has been a topic of interest in TEL for a long time, and coaching, which is a well-established method in practice, into an integrated concept. To the knowledge of the authors there is no such concept, and there is no work available that deals with coaching and reflection support in the same tool(s). We especially contribute to the EC-TEL 2015 theme of “Design for Teaching and Learning in a networked World” by providing a new approach of supporting learners to learn with each other and to help each other in networked learning, which builds on established methods and enhances them with tool support. We are aware of the fact that our concept and tools are work in progress, and we discussed challenges we expect to face for the implementation of colection in daily practice. Overcoming these challenges will be the focus of our future work.

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## References

1. Eraut, M.: Informal learning in the workplace. *Stud. Continuing Educ.* **26**, 247–273 (2004)
2. Schein, E.H.: *Helping: How to Offer, Give, and Receive Help*. Berrett-Koehler Publishers, San Francisco (2009)

3. Giesbrecht, T., Schenk, B., Schwabe, G.: Learning with facilitation affordances: the case of citizens' advice services. In: Proceedings of the Twenty Second European Conference on Information Systems (ECIS 2014) (2014)
4. Littlejohn, A., Milligan, C., Margaryan, A.: Charting collective knowledge: supporting self-regulated learning in the workplace. *J. Workplace Learn.* **24**, 226–238 (2012)
5. Prilla, M., Pammer, V., Krogstie, B.: Fostering collaborative redesign of work practice: challenges for tools supporting reflection at work. In: Proceedings of the European Conference on Computer Supported Cooperative Work (ECSCW 2013) (2013)
6. Grant, A.M., Stober, D.R.: Introduction. In: Stober, D.R., Grant, A.M. (eds.). *Evidence Based Coaching Handbook. Putting Best Practices To Work For Your Clients*. New Hersey, Wiley. pp. 1-19 (2006)
7. Boud, D.: *Reflection: Turning Experience into Learning*. Kogan Page, London (1985)
8. Schön, D.A.: *The Reflective Practitioner*. Basic Books, New York (1983)
9. Dillenbourg, P., Järvelä, S., Fischer, F.: The evolution of research on computer-supported collaborative learning. *Technology-Enhanced Learning*, pp. 3–19. Springer, Berlin (2009)
10. Eraut, M.: Non-formal learning and tacit knowledge in professional work. *Br. J. Educ. Psychol.* **70**, 113–136 (2000)
11. Greif, S.: *Coaching und ergebnisorientierte Selbstreflexion: Theorie, Forschung und Praxis des Einzel-und Gruppencoachings*. Hogrefe Verlag, Oxford (2008)
12. Whitmore, J.: *Coaching for Performance: Growing Human Potential and Purpose: The Principles and Practice of Coaching and Leadership*. Nicholas Brealey Publishing, London (2009)
13. Ajdukovic, M., Cajvert, L., Judy, M., Knopf, W., Kuhn, H., Madai, K., Voogd, M.: *ECVision. A European Glossary of Supervision and Coaching* (2014)
14. Anthony, K., Nagel, D.-A.: A brave new world: coaching online. *Coaching Today* (2012)
15. Hoyrup, S.: Reflection as a core process in organisational learning. *J. Workplace Learn.* **16**, 442–454 (2004)
16. Krogstie, B., Prilla, M., Pammer, V.: Understanding and supporting reflective learning processes in the workplace: the RL@Work model. In: Proceedings of the Eighth European Conference on Technology Enhanced Learning (EC-TEL-2013) (2013)
17. Baumer, E.P., Khovanskaya, V., Matthews, M., Reynolds, L., Sosik, V.S., Gay, G.K.: Reviewing reflection: on the use of reflection in interactive system design. In: Proceedings of DIS 2014 (2014)
18. Marcu, G., Dey, A.K., Kiesler, S.: Designing for collaborative reflection. In: Proceedings of PervasiveHealth 2014 (2014)
19. Daudelin, M.W.: Learning from experience through reflection. *Organ. Dyn.* **24**, 36–48 (1996)
20. Cressey, P., Boud, D., Docherty, P.: Productive reflection at work. In: Boud, D., Cressey, P., Docherty, P. (eds.) *Productive Reflection at Work: Learning for Changing Organizations*, pp. 11–26. Routledge, New York (2006)
21. Scott, S.G.: Enhancing reflection skills through learning portfolios: an empirical test. *J. Manag. Educ.* **34**, 430–457 (2010)
22. Prilla, M., Degeling, M., Herrmann, T.: Collaborative reflection at work: supporting informal learning at a healthcare workplace. In: Proceedings of the ACM International Conference on Supporting Group Work (GROUP 2012), pp. 55–64 (2012)
23. Fleck, R., Fitzpatrick, G.: Reflecting on reflection: framing a design landscape. In: Proceedings of the 22nd Conference of the Computer-Human Interaction Special Interest Group of Australia on Computer-Human Interaction, pp. 216–223. ACM, Brisbane, Australia (2010)

24. Davis, E.A.: Scaffolding students' knowledge integration: prompts for reflection in KIE. *Int. J. Sci. Educ.* **22**, 819–837 (2000)
25. Roschelle, J., Teasley, S.: The construction of shared knowledge in collaborative problem solving. In: O'Malley, C. (ed.) *Computer Supported Collaborative Learning*, pp. 69–97. Springer, Heidelberg (1995)
26. Dennis, A.R., Valacich, J.S.: Rethinking media richness: towards a theory of media synchronicity. In: HICSS-32. *Proceedings of the 32nd Annual Hawaii International Conference on System Sciences*, pp. 10–19 (1999)
27. Maynard, D.W.: *Bad News, Good News: Conversational Order in Everyday Talk and Clinical Settings*. University of Chicago Press, Chicago (2003)
28. Delvaux, N., Merckaert, I., Marchal, S., Libert, Y., Conradt, S., Boniver, J., Etienne, A.-M., Fontaine, O., Janne, P., Klastersky, J., Mélot, C., Reynaert, C., Scalliet, P., Slachmuylder, J.-L., Razavi, D.: Physicians' communication with a cancer patient and a relative. *Cancer* **103**, 2397–2411 (2005)
29. Bimrose, J., Brown, A., Holocher-Ertl, T., Kieslinger, B., Kunzmann, C., Prilla, M., Schmidt, A.P., Wolf, C.: The role of facilitation in technology-enhanced learning for public employment services. *Int. J. Adv. Corp. Learn. (iJAC)* **7**(3), 56 (2014)
30. Valero, P.: Deliberative mathematics education for social democratization in Latin America. *ZDM Math. Educ.* **31**, 20–26 (1999)
31. Crockett, M.D., Buckley, L.A.: The role of colection in equity-centered mathematics professional development practices. *Equity Excellence Educ.* **42**, 169–182 (2009)
32. Prilla, M., Blunk, O.: Reflective TEL: augmenting learning tools with reflection support. In: *Proceedings of the Tenth European Conference on Technology Enhanced Learning*. Springer, Berlin (2015)
33. Dillenbourg, P.: Over-scripting CSCL: the risks of blending collaborative learning with instructional design. In: Kirschner, P. (ed.) *Three Worlds of CSCL: Can We Support CSCL*, pp. 61–91. Open Universiteit Nederland, Heerlen (2002)
34. Hrastinski, S.: Asynchronous and synchronous e-learning. *Educause Q.* **31**, 51–55 (2008)
35. Stahl, G.: Theories of cognition in CSCW. In: *ECSCW 2011: Proceedings of the 12th European Conference on Computer Supported Cooperative Work*, 24–28 September 2011, Aarhus Denmark, pp. 193–212 (2011)
36. May, G.L., Short, D.: Gardening in cyberspace: a metaphor to enhance online teaching and learning. *J. Manag. Educ.* **27**, 673–693 (2003)
37. Fischer, G., Herrmann, T.: Socio-technical systems: a meta-design perspective. *Int. J. Sociotechnol. Knowl. Dev.* **3**, 1–33 (2011)