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## Awareness and Reflection in Learning Networks

Knowledge is an important resource in today's economy, and significant efforts are being invested in the design and development of learning resources, as well as learning software. Today, computer-mediated networking, exchanging of ideas and research tools be it on the Web, within organisations, learning communities, communities of practice etc. - what we consider a computer-mediated **networked learning environment** - are often essential parts of learning practice. While learners are to a certain degree aware about relations and resources, both of which have a potential to support learning, in these networks, technology can make explicit related resources and activities beyond the individual focus of attention. Additionally, technology can help learners bring knowledge and knowledge needs from their individual learning space into networked environments. For instance, technology can show learners the availability of peers with who to work together on a learning goal, or experts who can be asked in case of need.

Learning in such a networked learning environment has the advantage that learning analytics on artefacts with which the learner has interacted, like communications, topics on which searches have been executed, etc. can be used to create **awareness** on the learner's side of his own activities, social networks, and learning progress, and subsequently the learner is enabled to **reflect** on the basis own memory and perception as well as on collected data. **Learning Networks** (LNs), the online communities in networked learning environments can additionally help participants to develop their skills and competences in often non-formal, unplanned and ad-hoc learning situations and educational contexts.

Traditionally the concept of **awareness** is used in the research field of CSCW to re-establish awareness conditions of face-to-face situations with visual cues showing for example, who is online or working on a document. In the field of perception psychology, awareness is the state or ability to focus on certain stimuli of the environment while ignoring others. Here, being aware of something does not necessarily mean to understand it. In marketing, awareness usually relates to the degree consumers knows about a certain product. Generating public awareness is deemed as a task of the media to establish topics the public should know about.

Also **reflection** has several context-dependent meanings. In educational science, reflection could be seen as a critical, rigorous, and evidence based thinking, often activated by a puzzling (new) situation, involving (re-)thinking and a learning of a new understanding. Here, successful reflection leads to learning. Reflection can be also seen as a psychological process, a way of self-reflection, to inspect a way of thinking and may lead to a deeper understanding of one's learning strengths and weaknesses. In computer science, reflection can refer to the ability of programs to inspect its behaviour to adapt accordingly. The relation between awareness and reflection is that awareness of something may lead to reflection, or inversely, without being aware of something one cannot reflect on it. Especially in our fast-paced, ever dynamic world, where knowledge is a valuable (economic) asset, self-directed and lifelong learning are very important for learners, and for organisations it is important to have members who are able to do that. Through becoming aware of a certain fact, learners can reflect on it and eventually learn something new.

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Considering the multitude of views on awareness and reflection one of the questions is what does it mean for Technology Enhanced Learning and how does it relate to Learning Networks? Whilst there are many standards and technical approaches to overcome silo-boundaries of leaning services and tools in terms of re-usability and interoperability, there are hardly any working solutions to enhance awareness and support reflection processes in heterogenous networked learning environments, and to foster participation in learning networks. Furthermore, most of the tools applied were not designed to engage persons in active participation but to consume and absorb information provided. There is a pressing **need to directly support the instrumentation of awareness, and the activation of reflection processes.**



Figure 1: Impression from the workshop

More and more companies, (educational) institutions and research projects in which knowledge and knowledge transfer are the core of the daily business are implementing social media in their organizations. Explicating knowledge and their carrier are key features for learning in networks. With the rise of mobile small screen devices, the prerequisites to be aware of the different dimensions of the context of artefacts, like time, location, environment and relations between artefacts would be available. As Social Media, learning services and mobile Internet grow together, those will be one of the main resources for informal learning. Awareness support for lifelong learners in networked learning environments will help to make sense of the footprints of the usage of social media and mobile environments and will support the reflection about the fast changing dynamics in open research environments. Awareness support about learning activities in general will help

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learners identify knowledge that can be integrated in such learning networks, and knowledge needs that can be addressed in such learning networks.

We received 17 submissions, of which 11 were accepted as full papers.

The workshop was held on September 21, 2011. The workshop was organised in four sessions, where in the first three sessions papers were presented and discussed, and in the final session a discussion was held in the plenum.

### **Theory Papers**

The first block of the workshop consisted of papers that consider learning by reflection from a theoretical viewpoint. All papers, coincidentally, focus especially on learning by reflection in the workplace, albeit from very different perspectives.

The first paper, Balzert et al., *Enhancement of traditional Business Process Management with reflection - a new perspective for Organisational Learning?*, investigates, how an organisation can fulfill the requirement and necessity to continuously "learn", i.e. to further professional development of their employees and adapt their business processes. The authors work by relating the existing body of literature in the fields of business process management, reflection and reflective learning, and organisational learning. Based on this analysis, the authors identify the potential of learning by reflection in all phases of business process management. Especially, they identify the potential of learning by reflection in both top-down driven phases like designing and implementing business processes and in bottom-up driven phases like executing and improving business processes<sup>1</sup>.

The second paper, Kump et al., *The Role of Reflection in Maturing Organizational Knowledge*, starts off from the premise that both individual and collaborative reflection are necessary for organisational learning. In contrast to the previous paper, the authors thus focus on bottom-up driven processes of organisational learning. The analysis is based on an explorative interview study, as well as on existing models of knowledge maturing and of learning by reflection. As one of the outcomes, the authors postulate that in dependence of the level of maturity of the topic of reflection, reflection has the potential to rather create shared knowledge (e.g., best practices) or to modify existing knowledge (e.g., standardised processes)<sup>2</sup>.

The third paper, Pammer et al., *Reflective Learning at Work - A Position and Discussion Paper*, collects state-of-the-art of existing literature on learning by reflection in the light of work-related learning, postulates addendums and identifies open issues for future work. In particular, the authors discuss the reflection process, the scope of reflection, the context of reflection, and the role of tools for reflection. They identify the areas of making reflection theory applicable in work context, investigating the interrelationship between individual, collaborative and organisational learning by reflection, and providing technical support for learning by reflection as focal points for future research.

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<sup>1</sup>A recording of the talk can be found at <http://minus.com/mq2oAiYKx>

<sup>2</sup>A recording of the talk can be found at <http://minus.com/miUiqbw3e>

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The fourth paper, Prilla et al., *Computer Support for Collaborative Reflection on Captured Teamwork Data*, delves into the question of which technological support is required for collaborative reflection on teamwork. The authors base their analysis on existing literature and illustrate the potential of collaborative reflection at work by means of an observed team learning scenario. The authors conclude that technical systems that strive to support collaborative reflection at work need to provide articulation support, scaffolding and reflection guidance, and synergy support for deriving meaningful insights from experiences<sup>3</sup>.

### **Empirical Papers**

The last block of the workshop consisted of papers that deal particularly with self reflection in online learning networks. They presented, from an empirical point of view, new tools or approaches to support self reflection and some (initial) experience with the tools.

In the opening paper of this block, Fetter, Berlanga & Sloep in their contribution *Ad hoc transient groups: Instruments for Awareness in Learning Networks*, argue that Learning Networks need to be have mechanisms to support awareness, so participants can better share and jointly develop new knowledge. The authors propose a peer-support mechanism called *Ad Hoc Transient Groups (AHTGs)*, through which participants who have a question can be connected to and helped by other members with relevant experience in the area. In the authors' view this mechanism has the potential to improve collaboration, sense of connectedness and social capital of the participants in the Learning Network. Authors present an initial version of an AHTG tool, and results from its validation with stakeholders. Finally, authors argue that new areas of research in Learning Networks should include new ways of encourage people to recognize the value of their Personal Learning Networks for their professional activities and development<sup>4</sup>.

Verpoorten, Westera & Specht in their contribution *Annotations as reflection amplifiers in formal online learning*, argue that reflection triggers offer opportunities for learners to examine and evaluate their own learning. They report results from a controlled experiment in an online course about the effects of three types of triggers: (1) learners receive information of their performance against a yardstick (e.g., peer); (2) learners rate their mastering of the content, and (3) learners are asked to write down their learning experience. Results show that experimental groups reported significantly more reflective prompting and more intensive reflection than those participants in the control group. In contrast, however, no positive effects on learner performance and retention could be established. The authors, consequently, recommend that empirical studies document the nature of the thoughts and of the learning context induced by reflection triggers.

Finally, Krajagopal, Verjans, Van Bruggen & Sloep in their paper, *Stimulating reflection through engagement in social relationships*, argue that reflection on one's own behaviour and practice is triggered by social interactions. To engage in these social interactions there are skills, such as professional networking and intercultural literacy, that are needed but

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<sup>3</sup>A recording of the talk can be found at <http://minus.com/m4NxiLAVB>

<sup>4</sup>A recording of the talk can be found at <http://minus.com/mH3u4XUSr>

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often not considered. Then the authors describe the prerequisites of learning from these social interactions and the possibilities of technological support. Finally, they present a tool which supports intercultural communicative competence building. The tool combines individual performance, individual reflection together with guided and controlled social feedback on an individual's performance<sup>5</sup>.

### **Application Papers**

Reinhardt, Messerschmidt, & Nelkner present a mobile tool for awareness enhancements in the context of Research 2.0. In their paper "Awareness support in Scientific Events with SETapp". SETapp stands for the Scientific Event Tracker Application, which makes use of Near Field Communication (NFC) technology. The tool targets researchers to support them during a scientific event in sharing profile data, publication data, and past and future event information<sup>6</sup>.

Affective Metacognitive Scaffolding for the Enhancement of Experiential Training for Adult Learners by Moore et al. explores the challenge of connecting simulated learning experiences, such as job interview simulators, to real world practice. This connection will provide the learner with an augmented learning experience that exercises their metacognitive skills and informs their affective state. Through scaffolding and supporting the learner's metacognition and providing affective feedback this work aims to offer a scrutable, contextually aware and knowledge-enhanced experience that will give the learner the best opportunity to apply what they have learned effectively<sup>7</sup>.

The "ART (Analogical ReflectionTool): using analogies to promote reflection in science education" contribution by Kritikos and Dimitracopoulou, presents a tool which aims to support analogical reasoning and to help students to reflect on these analogies. Therefore, the tool scaffolds users with their reflections on the source domain to enable them a better understanding of the unfamiliar target domain.

Ullmann's paper on "An Architecture for the Automated Detection of Textual Indicators of Reflection" presents a software architecture for the automated detection of reflection cues in written texts. The paper outlines facets of reflection and demonstrates on three elements of reflection - reflective keywords, premise and conclusion argumentation, and though provoking questions - the automated detection of reflection indicators<sup>8</sup>.

You can find more information about the workshop and related workshops at the "Awareness and Reflection in Technology-Enhanced Learning" group on TELeurope.eu:  
<http://teleurope.eu/artel>

We want to use this opportunity to thank the authors for their contributions and the program committee for their support and reviewing activity.

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<sup>5</sup>A recording of the talk can be found at <http://minus.com/mbi65h2NNQ>

<sup>6</sup>A recording of the talk can be found at <http://minus.com/mSmsmeZ9>

<sup>7</sup>A recording of the talk can be found at <http://minus.com/mwaFc0W0I>

<sup>8</sup>A recording of the talk can be found at <http://minus.com/mWzoOPmWY>

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November 2011

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