

Open Research Online

The Open University's repository of research publications and other research outputs

EnquiryBlogger: using widgets to support awareness and reflection in a PLE Setting

Conference or Workshop Item

How to cite:

Ferguson, Rebecca; Buckingham Shum, Simon and Deakin Crick, Ruth (2011). EnquiryBlogger: using widgets to support awareness and reflection in a PLE Setting. In: 1st Workshop on Awareness and Reflection in Personal Learning Environments. In conjunction with the PLE Conference 2011, 11-13 Jul 2011, Southampton, UK.

For guidance on citations see [FAQs](#).

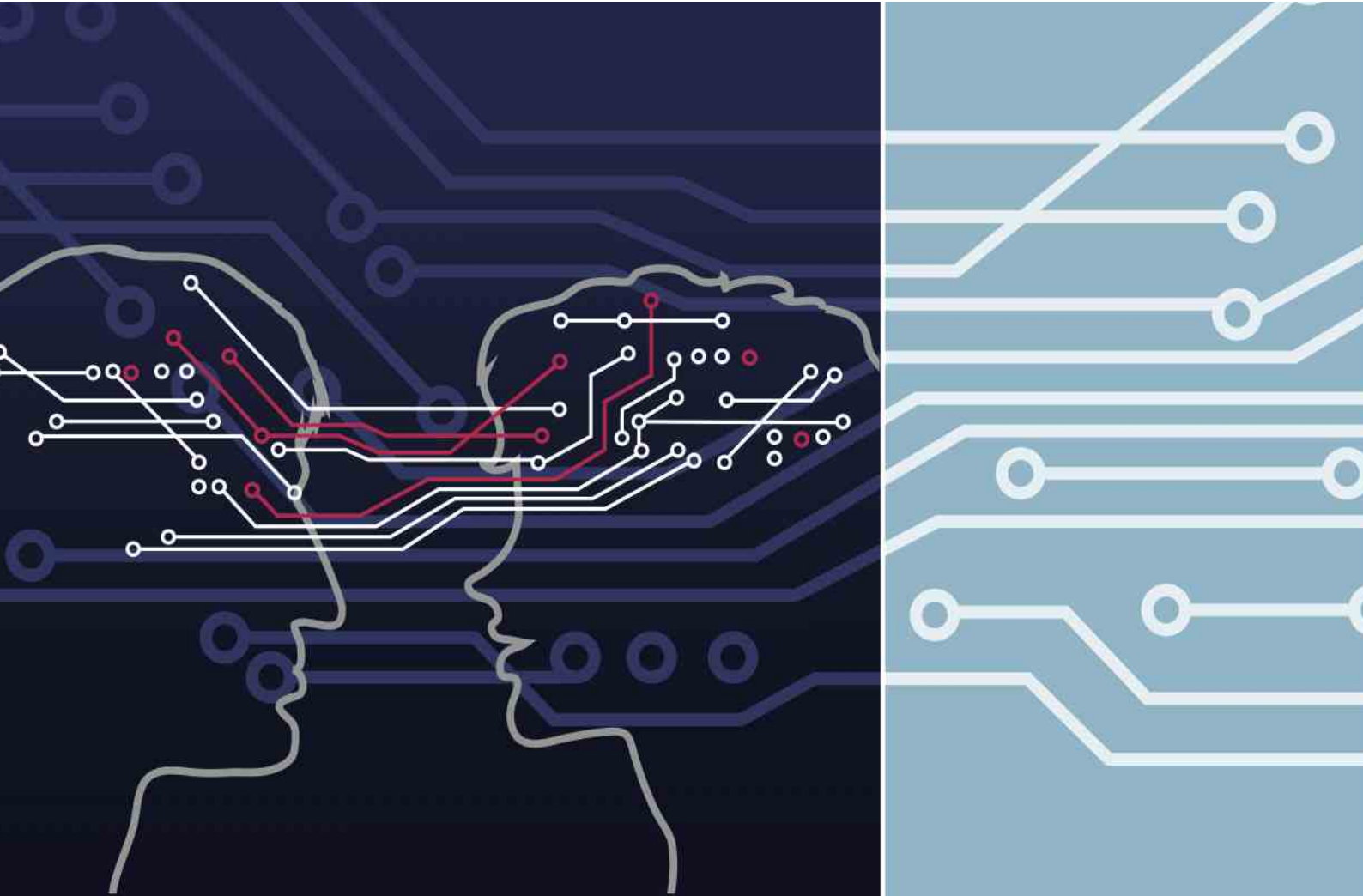
© The Authors

Version: Version of Record

Link(s) to article on publisher's website:
<http://www.pleconf.com/>

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's data [policy](#) on reuse of materials please consult the policies page.

oro.open.ac.uk



Proceedings of the 1st Workshop on Awareness and Reflection in Personal Learning Environments

In conjunction with the PLE Conference 2011

Southampton, United Kingdom, July 11, 2011

**Wolfgang Reinhardt
Thomas Daniel Ullmann
(Eds.)**

Please refer to these proceedings as

Wolfgang Reinhardt & Thomas Daniel Ullmann (eds.): Proceedings of the 1st Workshop on Awareness and Reflection in Personal Learning Environments. In conjunction with the PLE Conference 2011. Southampton, United Kingdom, July 11, 2011.

© 2011 for the individual papers by the papers' authors. Copying permitted for private and academic purposes. Re-publication of material from this volume requires permission by the copyright owners.

Addresses of editors:

Wolfgang Reinhardt
Computer Science Education Group
Department of Computer Science
University of Paderborn
Fürstenallee 11
33102 Paderborn

Germany
wolle@upb.de

Thomas Daniel Ullmann
Knowledge Media Institute
The Open University
Walton Hall
Milton Keynes
MK7 6AA

United Kingdom
t.ullmann@open.ac.uk

The front-cover was created by Harriett Cornish (The Open University, KM_i).

Editorial: Awareness and Reflection in Personal Learning Environments

While different researchers have stressed the importance of awareness and reflection support in Personal Learning Environments (PLEs) there is no agreed set of such functionalities in existence yet. Also we lack a structured overview of awareness and reflections issues that learners are facing in their daily learning activities. As both researchers and developers interested in the PLE domain seem to be in need of such information in order to best tailor their R&D activities, this workshop brought together participants from educational science, psychology, social science, computer science, and design to collect requirements and open issues in the domain.

Therefore, the workshop was designed in an interactive way, which was supported by the unique spirit of the PLE conference¹. The goal of the workshop was to collaboratively develop an integrated roadmap for future research and development in the domain. To achieve this goal we organised the workshop in a special way, which led to very fruitful discussions and a very satisfying outcome.



Figure 1: Outcome of the #ARPLE11 Workshop

The notice board shows the clustered research challenges in awareness and reflection as the result of 8 hours of concentrated work. To get to this point, we used a unique concept for the workshop, which turned out to be highly interactive and productive. We started

¹Also see the conference website at <http://www.pleconf.com/>

the workshop with short firehouse presentations of the participants to position individual's research in the area of awareness and reflection. Each presenter outlined challenges in this field based on four questions:

- What are you researching?
- What are the challenges of your research?
- What should we, as the participants of this workshop, focus on?
- What should be on the research agenda of the next five years?

The four questions were then used in the following brainstorming session using the brainwriting pool technique. The concept of the brainwriting pool allows to quickly generate ideas about the future research challenges of awareness and reflection and to let others annotate and develop these ideas (Figure 2).



Figure 2: Brainwriting pool

We generated over 200 challenges and annotations, which were clustered during the workshop. Therefore, we discussed the annotated notes and agreed to a set of overarching themes, which were extended during the process. All notes could be codified into one of the final eight clusters:

1. Fostering reflection and awareness.
2. Language and structure.
3. Support in e-learning environments.

-
4. The meta-level of reflection and awareness.
 5. Assessment of reflection.
 6. Emotions.
 7. Modelling.
 8. Skills.

We visualised the themes and their notes with a card story board. Based on the card story board the participants prioritised the clusters using the "long short list" technique. Every participant had to vote for three themes, which are the most important ones for future research in the area of awareness and reflection in Personal Learning Environments (see Figures 3, 4 and 5). In the final challenge and milestone session we discussed the outcomes of the workshop.

We think that we achieve a respectable result of this one day workshop thanks to all participants, who made this workshop such a great success.

The accepted papers, which are included in this proceedings and presented during the firehouse introduction, reflect the themes discovered during the workshop.

Wolfgang Reinhardt's and Christian Mletzko's paper on "Awareness in Learning Networks" argues for a refinement of the CSCW concept of awareness in the context of learning networks and personal learning environments. Awareness in learning networks is not only to re-establish face-to-face interactions, it also should include awareness about learning objects and services as well as other participants of the networks and the relations between them.

Kamakshi Rajagopal's paper on "Supporting Network Awareness: easing learners' journeys or challenging them to see?" makes a point about the need to change current views on the design of technologies supporting awareness and reflection in social networks. The focus of technology development should change from mere provision of awareness tools (solution-directed technology) as it does not take into account the needed proficiency to use such tools. Therefore, she argues for a design helping users to engage with data in a meaningful way (training-directed technology).

In the paper "EnquiryBlogger - Using Widgets To Support Awareness and Reflection in PLE Settings", Rebecca Ferguson, Simon Buckingham Shum and Ruth Deakin Crick present a tool aiming to support bloggers to become more aware of the dynamics involved with learner-driven enquiry and to help them to reflect about their skills development.

Thomas Daniel Ullmann, Rebecca Ferguson, Simon Buckingham Shum and Ruth Deakin Crick paper on "Designing an Online Mentoring System for Self-Awareness and Reflection on Lifelong Learning Skills" reports on an online tool, which aims to support mentees to become more self-aware about their lifelong learning skills and to foster reflection with the support of an online mentor.

Philip Meyer's and Thomas Sporer's position paper on "Introducing Feedback Mechanisms to Users of Higher Education ePortfolios" reports on a study conducted to explore the acceptance of feedback on reflective e-portfolios.

Finally, Steven Warburton's position paper on "Developing Effective Peer-to-Peer Support Mechanisms for Large Scale Distance Learning Programmes" describes a real-world sce-



Figure 4: Outcome of the brainwriting and clustering activities (part 2)



Figure 5: Outcome of the brainwriting and clustering activities (part 3)



Figure 6: Participants of the #ARPLE11 Workshop (from the left to the right: Thomas Ullmann, Wolfgang Reinhardt, Steven Warburton, Rebecca Ferguson, Kamakshi Rajagopal, Peter Mortimer, Ilona Buchen, David Delgado, Philip Meyer, Mark van Harmelen, Jose Mota)

nario based on the problem of how to support study-alone students in finding opportunities for peer learning and reflection at distance.

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>

November 2011

Wolfgang Reinhardt
Thomas Daniel Ullmann

Organizing Committee

Wolfgang Reinhardt, University of Paderborn, Germany.

Thomas Daniel Ullmann, The Open University, United Kingdom.

Contents

Editorial: Awareness and Reflection in Personal Learning Environments	2
Awareness in Learning Networks <i>Wolfgang Reinhardt and Christian Mletzko</i>	12
Supporting Network Awareness: easing learners' journeys or challenging them to see? <i>Kamakshi Rajagopal</i>	22
EnquiryBlogger - Using Widgets To Support Awareness and Reflection in PLE Settings <i>Rebecca Ferguson, Simon Buckingham Shum and Ruth Deakin Crick</i>	28
Designing an Online Mentoring System for Self-Awareness and Reflection on Lifelong Learning Skills <i>Thomas Daniel Ullmann, Rebecca Ferguson, Simon Buckingham Shum and Ruth Deakin Crick</i>	34
Introducing Feedback Mechanisms to Users of Higher Education ePortfolios <i>Philip Meyer and Thomas Sporer</i>	44
Developing Effective Peer-to-Peer Support Mechanisms for Large Scale Distance Learning Programmes <i>Steven Warburton</i>	46

Awareness in Learning Networks

Wolfgang Reinhardt and Christian Mletzko

University of Paderborn
Department of Computer Science, Computer Science Education Group
Fuerstenallee 11, 33102 Paderborn, Germany
{wolle,letris}@upb.de

Abstract. The term 'awareness' finds its roots in the research on Computer Supported Cooperative Work (CSCW) and often does not reflect the changed *modi operandi* in today's connected world. In this paper we argue that the term 'awareness' needs to be understood in a broader way when used in the context of networked learning. In Learning Networks, awareness is increasingly related to finding appropriate learning objects, peers and experts or the 'right' learning path. We discuss this different understanding and formulate open questions dealing with awareness in Learning Networks and Personal Learning Environments as well as their connection to reflection and issues of technical feasibility.

Keywords: awareness, definitions, learning networks, reflection

1 Introduction

Social Software Services have been widely adopted in the context of knowledge work (Enterprise 2.0) and scholarly communications (Research 2.0) and everyday activities of the lifelong learner (Web 2.0). As educational practice is increasingly becoming more connected, Social Software becomes more important for learners in a multitude of learning contexts (Learning 2.0, Connectivism). The connections between learners and learning objects, experts and peers, as well as activities like sharing, reusing, rating and recommending objects have become increasingly important regardless of the particular educational setting. In the context of Learning Networks, Social Software Services can be used as learning services in a number of different educational settings that might help a learner in the attainment of a goal or task. Those learning services can also be used for staying connected or exchanging information within a Learning Network.

Awareness about existing learning objects and services, opportunities for the exchange with like-minded people as well as awareness about own skills and possible competence deficits are of particular importance in Learning Networks. Thus, awareness in this context goes beyond the common CSCW understanding of re-establishing face-to-face situations with real-time awareness support through videoconferencing or shared whiteboards. In this paper we sketch a broader understanding of awareness in networked learning and discuss the relations between awareness, reflection, cognition as well as communication and co-operation.

The remainder of the paper is structured as follows: in Section 2 we introduce the concept of Learning Networks and briefly discuss the possibilities of the participants. In Section 3 we discuss the issues with the term 'awareness' that exist in the increasingly networked learning situations we find in most of today's educational contexts. We argue that awareness is always towards a certain object or incorporating a special interest and cooperative processes. Therefore, awareness has to be considered in a framework that takes cognitive and reflective processes into account and reflects the effects on co-operation of missing and enhanced awareness. Finally, in Section 4, we sketch an agile design and development process for awareness-supporting tools in the context of Learning Networks and provide open questions as discussion points for the ARPLE workshop.

2 What are Learning Networks?

Learning Networks (LN) is a term coined by Koper and Sloep [9] that reflects the increasing amount of learning activities taking place among learners in a networked fashion. Such online networks have become an essential expansion of real-world groups of learners and facilitate information exchange and mutual help in those groups. There are also cases of communities that solely exist in the online world and most often those assemble around very specific (learning) objects [4]. There are many concepts in existence that deal with the topic of networked learning and the concept of Learning Networks significantly overlaps with many of them. However, the concept of Learning Networks creates a theoretical framework that factors in both formal and informal learning process, social interactions and different educational contexts (e.g. self-directed, institutionally guided or workplace learning). Learning Networks are social networks that help the participants to share information, connect to like-minded people and to co-operatively create new knowledge.

Learning networks are composed of people that share a similar interest and pursue similar (learning) goals. Depending on the educational context and the respective people, those learning goals can be group goals that are defined by the curriculum or individual goals, they can be well-defined or diffuse and often not all participants in a Learning Networks are able to explicate those goals. Koper et al. [8] point out that the participants in Learning networks could:

- exchange experience and knowledge with each other,
- collaborate on common research questions and tasks,
- help other participants in the Learning Network e.g. with answers to their questions, shared learning objects, feedback etc.,
- get support from other participants in the LN,
- set up focused working groups,
- reflect on their learning goals, skills and development,
- support each other when encountering learning problems, and
- use tools and services to create, share, find and access learning resources.

The learning objects in a Learning Network can exist prior to the emergence of the LN or can be co-created by the participants in the LN. Learning objects can be all digital artifacts that might help the participants developing their skills and competences, that help solving a given task or reaching a learning goal. Those learning objects explicitly include formal learning material as well as social media artifacts and open educational resources (OER). The learning services that facilitate the learners' activities range from institutional services to Social Software Services and are subject to continuous change (see the elaborations of Nicholls and Harrison (2009) on the modern IT working environment or knowledge workers [10]). Learners can be part of multiple Learning Networks at a time and endue different roles in each of them. While in one LN someone can possess comprehensive knowledge and experience, she can be only at a beginners level in another LN. For a detailed consideration of Learning Networks see the elaborations in [8,9,15].

There is a strong relation between Learning Networks and Personal Learning/Research Environments (PLEs/PREs) as the latter can be seen as collection of access points to objects, people and services in one Learning Networks. Awareness and reflection are crucial for one's personal trajectory through Learning Networks as well as for personal motivation and innovation. On the other hand, awareness about objects, people and services may be triggering reflection, networking and self-awareness.

3 Issues with the term awareness

In the context of knowledge work, the scientific utilization of the term 'awareness' finds its roots in the research on Computer Supported Cooperative Work (CSCW). It typically refers to the efforts of providing users with digitally enriched environments that try to emulate face-to-face situations.

So-called 'groupware' reflected the increasing work that was carried out in a timely and geographically separated manner. Users were provided with technology and tools that aimed at supporting their creative power and their need for synchronizing with their colleagues. Therefore, typical features of such groupware applications included the indication of a user's online status, her current physical location or the object she was currently working on. Awareness-support in groupware aimed at enabling users to cooperate "*approximately as if they were in the same physical space*" [13]. Schmidt (2002) also pointed out that the term 'awareness' is "*found ambiguous and unsatisfactory*" and "*hardly a concise concept by any standard*". He goes on and explains that researchers in CSCW have been using various adjectives to characterize their specific area of awareness-support. Gutwin, Greenberg and Roseman (1996) for example use the adjectives informal, social, group-structural and workspace to describe relevant strands of awareness research [6]. Other compound terms are 'general awareness', 'group awareness', 'mutual awareness', 'background awareness' and many more. Gutwin, Greenberg and Roseman (1996) point out that informal awareness would be "*the glue that facilitates casual interaction*" and would be mainly considered with the general

sense of who is around and what they are interested in. Following Gutwin, Greenberg and Roseman (1996), social awareness is the information about others in a social or interactional context, e.g. their emotional state or their body expression. Group-structural awareness is concerned with organizational information, roles and responsibilities in groups. Finally, workspace awareness is concerned with other's interactions with the cooperative "*space and its artifacts*" [6].

CSCW research has largely focused on supporting the different characteristics of awareness in a real-time way; they embedded continuous video or synchronous interaction spaces into groupware applications or created video tunnels between different workspaces, desktop sharing tools and video conferencing tool in order to provide workers with the ability to collaborate in a roughly identical physical space. In the context of Learning Networks, we see the need for a different type of awareness, that is only partially related to WYSIWIS (What you see is what I see) or WYSIWID (What you see is what I do).

3.1 Approaching 'awareness' in Learning Networks

We need to have a look at the type of social interactions that take place in the context of Learning Networks in order to arrive at a better understanding of the complexity of the term awareness in this context. Unlike in CSCW research, awareness in Learning Networks is not solely concerned with re-establishing face-to-face interaction situations in a technology enhanced environment. While the indication of others' online status, physical location and emotional state might be valuable awareness information in Learning Networks as well, we see the essence of awareness in Learning Networks in the making participants informed about learning objects and services as well as other participants in the networks. Moreover, supporting participants in understanding the (semantic) relations between those objects is crucial for awareness in LNs.

In LNs learners are sharing expertise and individual knowledge with each other using the services available in the network. Thus, open and private communication as well as the externalization of individual knowledge in artifacts of any kind are important activities of the learners. They share their views, questions and ideas in services that allow others to rate, comment, share and reuse the objects. In order to carry out those activities, awareness of their existence and their relation to oneself is needed. Learners need ubiquitous tools that support them in bringing learning objects and other participants of the Learning Network in their area of consciousness, allowing them to reflect about them and relate them to other objects, their own knowledge and skills. Interface patterns like 'news streams' or 'activity streams' are supportive design elements for such tools. Also recommender systems that make their recommendation rational visible to the user help making connections between objects in the LN more obvious. Regular notifications about new participants and recommended content are important triggers for participants' awareness of the Learning Network's activities and development. Facebook's email notification system for example, is a major driver for its high rate of monthly active users [16]. Users can choose the granularity and frequency of notifications and whether they would like to be

notified by email or as push notification on their mobile devices what results in highly active participation in the social interactions on the platform. Similarly, mobile applications like AroundMe¹ or Locly² make users aware of local businesses, information in social media applications, news or events and are used by hundreds of thousands users worldwide. Mobile applications for awareness support in Learning Networks should provide users with access to peers and learning objects around their current position in order to stimulate ad-hoc, local interactions or recommend educational events that help developing a learners competences or help developing needed skills.

Being aware of what the interest and knowledge of other people in the network is, *“is a precursor to seeking a specific person for help”* [3]. Thus, awareness of “who knows what” improves the performance of the whole network and is crucial to prevent stagnation in case someone temporarily leaves the LN. For participants in Learning Networks it is important to have a broad overview about the knowledge and skills of the other members. Even if the first assessment of another’s competences are not well and truly, they might help getting interaction started [2].

Changes in the structure and size of the Learning Network are indicators for changing interactions and prosperity of the network. Awareness about those facts can be achieved through a steady monitoring of the network’s properties and appropriate visualizations. Visualizations should be specifically tailored to support the awareness of certain facts. Those features should be developed in close interaction with the users of the tool; ideally in an agile development practice and centered around the users. Awareness support through visualizations could be realized by longitudinal visualizations the make tangible the development of the networks’ structure or thematic priority. Such replays support the common understanding of the current state of a network and especially support new participants of the network and should be considered for any technology support for LNs.

Social interactions are at the core of networked learning processes and support individual learning as well as group progress likewise. Chua (2002) points out that social interactions with peers can positively influence the quality of the information created [1]. Following Hofkirchner (2002), people act in their own cognitive context and are using their cognitive capacity to interact with others. Mediated by this symbolic interaction, shared interaction spaces come into existence that in some cases are used for co-operation between the enlisted parties (cf. Figure 1 and [7]). Otherwise put, individual cognition is a precondition for communication, which in turn is a necessary prerequisite for co-operation to take place. Thus, the web in general and Learning Networks in particular are socio-technical systems that support and augment communication and co-operative knowledge development of the participating people [5,7]. Rogers and Shoemaker (1971) describe communication as a process where the participants create and

¹ Available for iPhone at <http://itunes.apple.com/de/app/aroundme/id290051590>

² Available for iPhone at <http://itunes.apple.com/de/app/locly/id285694326>

share information in order to gain a common understanding [12] and a lingua franca in order to pave the way for prospective co-operation.

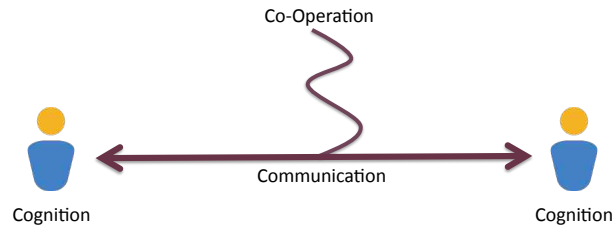


Fig. 1: Threefold process of cognition, communication and co-operation (rooted in [7])

The CCRAC model of social interaction in Figure 2 is an extension of Hofkirchner's threefold process of information [7] that takes into consideration the above elaborations on the importance of awareness and reflection for successful learning and co-operation in Learning Networks. The CCRAC model is not intended to describe a chronological sequence of actions as each step may feed into any other (e.g. during the reflection-on-action [14] one might become aware of a certain issue that might lead to setting up a shared collaborative workspace). Rather it is intended to show how individual cognition, awareness and reflection are important for communication and co-operation and how those concepts condition each other. The success of Learning Networks is dependent from all CCRAC variables.



Fig. 2: The CCRAC model

The interpretation of shared symbols and codes, common learning objects and existing rules takes place in the individual cognitive context that is shaped by prior knowledge and skills as well as known patterns of social interactions. The capability to perceive content and people is strongly influenced by social networking and awareness of those contents. Moreover, individual motivation, desire for participation and active use of the elements of the shared symbolism are crucial factors for the cohesiveness of a Learning Network. Self-awareness and reflection about the activities and developments in the network are important steps in accomplishing personal and shared goals and paving the way for intensified social interactions, communication and co-operation. The goal-oriented collaboration in Learning Networks is carried out using existing learning services that are in urgent need of awareness support features in order to support their users becoming more familiar with the activities and contents of the network. Enhanced awareness will eventually lead to more cohesion, social care, more motivated learners and better results.

4 General discussion

In this article we introduced the concept of Learning Networks and made the case for an adapted understanding of the term 'awareness' in this context. Awareness in Learning Networks is an important trigger for reflection, communication and co-operation among the learners and support the cohesion of the network. A common identify and the sense of togetherness are very important for the development and quality of social interactions and positively influence sharing of knowledge and the quality of co-operatively generated new knowledge. To support the development of such team spirit and high-quality interactions, awareness about the Learning Network's objects and people is crucial.

In [11] we introduced the conception of an awareness dashboard tailored to the use by researchers in their networks. We produced paper prototypes of the dashboard and evaluated how well scholars perceived the awareness support of the prototype. The 15 participating researchers rated the dashboard significantly better with regards to its awareness support ($M = 2.03$, $SD = 0.67$) than the common toolsets that they were familiar with ($M = 4.81$, $SD = 1.43$), $t(14) = 8.391$, $p < 0.001$ ³. From our experience with the requirements management, the design and evaluation of our paper prototype, we see the following important points with regards to the requirements, design and implementation of tools to enhance awareness in Learning Networks:

- Be sure what kind of awareness you want to support with your tool. The existing body of knowledge in the CSCW research provides valuable information on approaches that work and such that do not.
- Design your tool based on the experiences of your potential prospective users. Ask them about issues they are facing in their daily working routines and design your tool based on those stories.

³ For more detailed results of the design and evaluation of AWESOME see [11].

- First design the user interface of your tool. Decide what kind of interface pattern(s) you like to apply to your tool. Produce paper prototypes of your tool and test them with real users. If they like your prototypes, go on and make them clickable; if they do not like them listen carefully and go back to the drawing table. Make sure you understood the needs and requirements of your users correctly, create new paper prototypes and test them again. This continuous cycle should only end when your test users are satisfied with the prototypes.
- After you designed your prototypes, you can go on and create your actual software. Try to build them in an agile way, specify the desired behavior of your software and involve testers as early as possible. From the user-centered design and the tests of the user prototypical interface you should have an exact understanding of what your prospective users look for in your tool. Built your tool in a way that covers those expectations.
- Once you deployed your tool you have to listen to your users: ask them how well your tool raises their awareness. Get to know what they are aware of with your tool. If your goals and their perception do not fit you have to react upon and improve your tool.

The above lists certainly represents a design and feedback cycle that not many educational technology providers adapted so far. Nonetheless, from our experience with the development, roll-out and acceptance of new tools we see this the most stimulating and promising way of building new tools.

From our elaborations in this paper and the discussions with fellow researchers, we see a need for discussing how the term awareness could be applied in the research on Learning Networks, networked learning and Personal Learning Environments. The following collection is far from comprehensive but aims to be a discussion starter for the participants of the ARPLE 2011 workshop:

1. How important is group awareness for the achievement of group goals?
2. About what objects have students to be aware of in the context of TEL courses?
3. How do we best support students with technology enhanced environments that raise their awareness?
4. Which impact do visualizations have on individual/group awareness?
5. Do visualizations support or hinder awareness processes? What if the visualizations do not represent the objective reality?
6. How important is awareness for reflection and vice versa?
7. How important is (peer) feedback for awareness and reflection
8. How can socratic questions that force learners to explain their rational for arguments be triggers for awareness and reflection?
9. How do multi-modal interfaces and multiple representations impinge on a learners awareness?
10. Is externalisation of individual knowledge a key trigger for reflection?
11. What are facilitators that may help learners to become more aware of their own knowledge and missing competences or skills?

References

1. A. Chua. The influence of social interaction on knowledge creation. *Journal of Intellectual Capital*, 3:375–392, 2002.
2. R. Cross, T. Laseter, A. Parker, and G. Velasquez. Assessing and improving communities of practice with organizational network analysis. Technical report, The Network Roundtable at the University of Virginia, 2004.
3. R. Cross, A. Parker, L. Prusak, and S.P. Borgatti. Knowing what we know: supporting knowledge creation and sharing in social networks. *Organizational dynamics*, 30(2):100–120, 2001.
4. J. Engeström. Why some social network services work and others don't — or: the case for object-centered sociality. <http://bit.ly/eJA70Q>, April 2005.
5. C. Fuchs, W. Hofkirchner, M. Schafranek, C. Raffl, M. Sandoval, and R. Bichler. Theoretical Foundations of the Web: Cognition, Communication, and Co-Operation. Towards an Understanding of Web 1.0, 2.0, 3.0. *Future Internet*, 2:41–59, 2010.
6. C. Gutwin, S. Greenberg, and M. Roseman. Workspace awareness in real-time distributed groupware: Framework, widgets, and evaluation. *People and Computers*, pages 281–298, 1996.
7. W. Hofkirchner. *Projekt Eine Welt. Oder Kognition Kommunikation Kooperation. Versuch über die Selbstorganisation der Informationsgesellschaft*. LIT, Münster, 2002.
8. R. Koper, editor. *Learning Network Services for Professional Development*. Springer Berlin, 2009.
9. R. Koper and P. Sloep. Learning Networks - connecting people, organizations, autonomous agents and learning resources to establish the emergence of effective lifelong learning. Programme plan, Open University of the Netherlands, 2003.
10. J. Nicholls and D. Harrison. Servicing 'core' and 'chore': A framework for understanding a modern it working environment. Presentation at the Institutional Web Management Workshop. Retrieved from <http://www.slideshare.net/joenicholls/framework-for-a-modern-it-working-environment>, 2009.
11. W. Reinhardt, C. Mletzko, H. Drachsler, and P. Sloep. AWESOME: A widget-based dashboard for awareness-support in Research Networks. In *Proceedings of the 2nd PLE Conference*, Southampton, UK, 2011.
12. E. M. Rogers and F. F. Shoemaker. *Communication of Innovations; A Cross-Cultural Approach*. The Free Press, New York, N.Y., 1971.
13. K. Schmidt. The problem with awareness. *Computer Supported Cooperative Work*, 11:285–298, 2002.
14. D.A. Schön. *The Reflective Practitioner: How Professionals think in Action*. Maurice Temple Smith, London, 1983.
15. P. Sloep. *Learning Network Services for Professional Development*, chapter Social Interaction in Learning Networks. Springer Berlin, 2009.
16. F. Wilson. Email: Social media's secret weapon. Available online <http://www.businessinsider.com/social-medias-secret-weapon-email-2011-5>, May 2011.

Supporting Network Awareness: easing learners' journeys or challenging them to see?

Kamakshi Rajagopal

Centre for Learning Sciences and Technologies, Open Universiteit,
Valkenburgerweg 177, AT 6649 Heerlen, Netherlands
{kamakshi.rajabopal}@ou.nl
<http://www.celstec.org>

Abstract. This paper argues for a changed vision and approach to the design of technologies supporting awareness and reflection for learning in social networks. It discusses the relationship between awareness, reflection and learning, and looks into what supporting these functions with technology for the purpose of learning actually entails.

Key words: awareness, reflection, learning, data and information analysis, visualisation

1 Introduction

In recent years, the concept of a Personal Learning Environment (PLE) as the learners personalised window on the world has gained prominence. PLEs take the form of platform where a learner can gather information about the outside world and share and broadcast own content and interests [1]. The concept of a PLE originates from a view on learning in which learners take a central role in understanding, planning and managing their own learning. Knowledge is created here through individual reflection or through negotiation in the interaction between learners [2, 3]. Technology in a PLE allows learners to structure and manage the complex environment of people and content around themselves according to their own personal preferences. The learner at the centre is the orchestrator of the whole environment, browsing, selecting and choosing the most relevant information resources including content and people [4–6]. Often PLEs consist of technologies supporting search, access to content, classification of content and information, personal knowledge creation and presentation, and communication with peers. Learners have a high level of control over the tools they use, appropriating them to suit their learning needs [7]. Increasingly, technological functionalities are being developed that aim to promote the individual learner's awareness of their environment, i.e. the complex surroundings in which they learn. Their aim is to identify relevant people and resources in the complex environment and keep the learner up-to-date of potentially relevant changes. The underlying thought is that increasing awareness of the environment will also

increase the learners opportunities to reflect on their position, behaviour and potential activities in this context. In turn, this would increase their chances to learn from the environment or use the networked resources more efficiently or effectively [8]. The author of this paper argues that this assumption limits the scope for technological support created for learners, diverting the attention to just one aspect of this type of learning. A change is proposed in the way technological support for this type of learning process is approached. This paper is structured as follows: section 2 looks into the relationship between awareness and learning in networks, and tries to clarify the learning process that is aided by increased awareness. Section 3 describes existing technological support systems, and identifies what type of support is lacking. Section 4 looks into possibilities of providing added support, followed by some conclusions and further research steps.

2 Awareness and learning in social networks

Before going on to look at current technological support for learning, it is important to understand the relationship between awareness and learning in social networks. Viewing awareness as an important aspect of learning reveals a particular view on how people learn. Awareness relates to the active or latent information and knowledge people have about their environment. There are different types of awareness, ranging from group awareness, task awareness and workspace awareness to contextual awareness and peripheral awareness [9] and even social awareness or network awareness [10]. Learning in all these situations however depends on the notion that awareness plays a role in informal and non-formal learning. The learning process underlying this thought is the following: learning happens when (i) learners are able to identify relevant situations, opportunities, resources or people in their environment, and (ii) when they are able to capitalize on these situations or opportunities, or to connect with these resources and people in the context of their own learning needs. Awareness of the environment and an ability to reflect on the inputs from the environment are essential prerequisites of this type of learning. Technologies supporting heightened awareness of the environment or encouraging reflection on the environment increase the opportunity of relevant connections to happen. The focus of technology development therefore has been on supporting and enabling more awareness of the environment.

However, these prerequisites of awareness and reflection are problematic: they depend on a certain skill and attitude of the learner [11]. On the one hand, the skill of reflection assumes a particular type of learner, who can identify their own learning needs through self-reflection and plan a learning path to fulfill these needs - a certain maturity in learning. On the other hand, awareness only becomes an important need in the learning process, when learners have experienced the advantages of having more and more varied access to their environment.

From a technology design point-of-view, it cannot be assumed that the average learner is proficient in these skills. Providing technological support for

these needs therefore becomes very challenging, as increased or diverse access to information or data is not enough.

3 Solution-directed technology

Understanding this aspect of learning is crucial for technology designers, as it shifts the focus of the need for technological support. Technology so far has been solution-directed, largely focused on increasing awareness of the environment in various ways. These include:

1. elucidating hidden structures in networks (such as LinkedIn InMaps [12] and [13]): network visualizations are increasingly used to deliver more insight into the network. The value of these visualisations, however, lies in how the learner interprets and uses it. The learning outcomes of such increased awareness tools for personal networks is not yet proven.
2. informing an individual of the activities or behaviour of another that can have a consequence for the individuals own activities: these awareness systems can range from physical objects in the environment of a person [14] to automated activity feeds in social networking sites [15].
3. improving existing connections or ties between learners, for example, to support workspace awareness between colleagues [16] or to support a team writing a document together, with a tracking system that explicitly shows the activities of other group members, stimulating better coordination between them and resulting in the creation of a better product [17]
4. giving a learner more insight into their own learning behaviour through analysis of logged data of learner behaviour [18] or automated analysis of learner-generated content [19, 20]: the learner is offered diverse views of the data, with the aim of instigating reflection. The interpretation of the analysis is mostly left to the learner.

In all these cases, the nature of this learning as explained in section 2 has in one way or another not been taken into account. The underlying assumptions made of the competences of the learner remain. The first three types of awareness technology assume that the learner acknowledges the need for awareness and is able to understand, interpret and act upon various data from their social network. In the last type of technology, learners are assumed to be able to understand the complex presentations and technological interpretations of their own data, and to be able to act based on them. The design focus in the existing technological support for awareness and reflection is on the problem of abundance. These technological solutions build on the strengths of technology, to go beyond the network of the individual learner, to gather data and analyse data across several networks that might of interest and use to the learner. It gives the learner more control over the vast amounts of data in the network and helps the learner navigate to useful data in the network. However, this often goes beyond the skills and competences of many learners, potentially of use to advanced learners. Their value for novices is not yet proven. The approach taken to the

development of technology for supporting learning through awareness needs to take into account more varied users.

4 Training-directed technology

There is a need and an opportunity for a different approach to technology design, one that focuses on the problem of developing the learner skill, competence and attitude. There is a real scope for this approach, as these qualities of the learner lie at the basis of learning in social networks. The challenge for educational technology designers then becomes how to engage learners with the data in a meaningful way, such that they learn to see relevant issues in the environment for their individual learning needs, and that they take actions based on what they have learnt. Technologies that can achieve this goal could potentially cater to a larger number of users, and especially novices.

5 Conclusion

A different approach is needed in the design of technology for supporting awareness and reflection for the purpose of learning. Further research possibilities include developing functionalities to train learners in the required skills and competences, going further than providing access to the learner information in various ways. To create such innovative functionalities also requires further understanding of this type of learning.

References

1. S. Downes. 2007. Learning Networks in Practice. In: *Emerging Technologies for Learning* pp. 19-27. Coventry, UK: British Educational Communications and Technology Agency.
2. D. Cormier, D. 2008. Rhizomatic Education: Community as Curriculum. *Innovate: Journal of Online Education*, 4(5), 6.
3. G. Siemens. 2005. Connectivism: A Learning Theory for the Digital Age. *International Journal of Instructional Technology and Distance Learning*, 2(1), 310. Citeseer.
4. G. Conole, M. Delaat, T. Dillon, J. Darby. 2008. Disruptive technologies, pedagogical innovation: Whats new Findings from an in-depth study of students use and perception of technology. *Computers and Education*, 50(2), 511-524.
5. S. Schaffert, W. Hilzensauer, 2008. On the way towards Personal Learning Environments: Seven crucial aspects. *Elearning papers*.
6. S. Wilson, O. Liber, M. Johnson, P. Beauvoir, P. Sharples, C. Miligan. 2006. Personal Learning Environments: Challenging the Dominant Design of Educational Systems. In *Proceedings of the Joint International Workshop on Professional Learning, Competence Development and Knowledge management*. Crete, Greece.
7. G. Attwell, J. Cook, A. Ravenscroft, 2009. Appropriating technologies for contextual knowledge: Mobile Personal Learning Environments. In M. D. Lytras, P. Ordonez De Pablos, E. Damiani, D. Avison, A. Naeve, D. G. Horner, et al., *Best*

- Practices for the Knowledge Society. Knowledge, Learning, Development and Technology for All (pp. 15-25). Springer Berlin Heidelberg.
8. W. Reinhardt, C. Mletzko, H. Drachsler, P.B. Sloep. 2011. AWESOME: A widget-based dashboard for awareness-support in Research Networks. Proceedings of the PLE Conference 2011. July, 11-13, 2011, Southampton, UK.
 9. O. Liechti, 2002. Editorial: Awareness and the WWW. *International Journal of Human-Computer Studies*, 56(1), 1-5.
 10. D. Steiny, H.O. Kukkonen. 2007. Network awareness: social network search, innovation and productivity in organisations. *International Journal of Networking and Virtual Organisations*, 4(4), 413.
 11. K. Rajagopal, D. Joosten-ten Brinke, J. Van Bruggen, P.B. Sloep, (submitted) Understanding Personal Learning Networks: their structure, their content and the networking skills needed to optimally use them.
 12. LinkedIn InMaps <http://inmaps.linkedinlabs.com/>
 13. F. Wild, C. Valentine, P. Scott. 2010. Shifting Interests: Changes in the Lexical Semantics of ED-MEDIA, *International Journal on E-Learning*, Chesapeake, VA, 9, 4, pp. 549-562, AACE
 14. H. Alavi, P. Dillenbourg, F. Kaplan. 2009. Distributed Awareness for Class Orchestration. In U. Cress, V. Dimitrova, M. Specht, Learning in the Synergy of Multiple Disciplines: 4th. European Conference on Technology Enhanced Learning (pp. 211-225). Nice, France: Springer-Verlag Berlin Heidelberg.
 15. J. Dunlap, P. Lowenthal. 2009. Tweeting the night away: Using Twitter to enhance social presence. *Journal of Information Systems Education*, 20(2).
 16. P. Dourish, S. Bly, 1992. Portholes: Supporting awareness in a distributed work group. In Proceedings of the SIGCHI conference on Human factors in computing systems (p. 541547). ACM New York, NY, USA.
 17. C. Gutwin, M. Roseman, S. Greenberg. 1996. A Usability Study of Awareness Widgets in a Shared Workspace Groupware System, Proceedings of the Conference on Computer-Supported Cooperative Work, pp. 258-267. Boston: ACM Press.
 18. D. Verpoorten, W. Westera, M. Specht. 2011. Infusing reflective practice in eLearning courses Can widgets help?, *International Journal of Technology Enhanced Learning*, 3(1), 93109.
 19. A. J. Berlanga, M. Kalz, S. Stoyanov, P. Van Rosmalen, A. Smithies, I. Braidman. (accepted). Language Technologies to Support Formative Feedback. *Educational Technology and Society*.
 20. S. Trausan-Matu, T. Rebedea. 2010. A Polyphonic Model and System for Interanimation Analysis in Chat Conversation with Multiple Participants. *Computational Linguistics and Intelligent*, 354-363.

EnquiryBlogger – Using Widgets To Support Awareness and Reflection in a PLE Setting

Rebecca Ferguson¹, Simon Buckingham Shum¹
and Ruth Deakin Crick²

¹ KMi, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK

² Graduate School of Education, University of Bristol,
35 Berkeley Square, Bristol BS8 1JA, UK

r.m.ferguson@open.ac.uk s.buckingham.shum@gmail.com ruth.deakin-crick@bristol.ac.uk

Abstract. Blogs provide environments within which people can articulate, refine and reflect on practice. These characteristics make them useful for learners who are developing the practical skills and learning dispositions that are associated with authentic enquiry. The EnquiryBlogger tool is being developed to extend the core features of a robust, open source blogging platform in order to support awareness and reflection for enquiry-based learners. The first phase of the project developed blog plug-ins, together with associated teacher dashboards, and piloted their use. Feedback and use data show that the tools support reflection and are valued by learners. The pilot study has informed the development of a second phase of the project, which will support customization of these tools and increase learners' opportunities to develop awareness of the experiences of others.

Keywords: affect, blogs, enquiry, EnquiryBlogger, learning dispositions, learning power, reflection, widgets

1 Introduction

Blogs are frequently updated personalised websites, consisting of short posts with commentary and links [1]. They are often employed as 21st-century online incarnations of the personal journal and the research journal. Unlike their paper equivalents, blogs are not only personal records, but are also sites for collaboration and for the construction of social networks. They offer authors and readers the potential to move beyond the expression of a purely informative, individual view towards deliberation, participation in debate and the development of shared understanding.

In the context of education, blogs offer learners opportunities to incorporate many perspectives, to develop carefully crafted contributions, to reflect and to make considered responses to others [2]. The medium provides an environment in which learners can observe, articulate and refine practices [3]. At the same time, by making use of the comment facility, they are able to share thoughts, ideas and opinions [4]. In order for students to engage effectively with this emerging genre, they need to be able

to experiment and take ownership of their writing, learning to develop a blog as a space for personal learning, reflection and interaction [5].

These affordances of blogs are relevant to students engaged in learner-driven enquiries, which require the use and development of a set of interconnected thinking and learning skills. Researchers at the University of Bristol identified these skills and dynamics while developing a theoretically and empirically grounded approach to learning through personalised, authentic enquiry [6]. This approach starts from a topic of interest to the learner, and progresses through to assessment. Eight dynamics in this process, loosely sequenced, are shown in Table 1, with associated thinking and learning capabilities shown on the right.

Table 1. Skills and dynamics associated with learner-driven enquiry.

Dynamics of a learner-driven enquiry	Thinking and learning skills
1. Personal Choice: concrete place/object	Choosing/deciding
2. Observation – description	Observing/describing
3. Generating questions	Wondering/interrogating
4. Uncovering narratives	Discovering/storying
5. Mapping	Navigating/mapping
6. Connecting with existing knowledge	Spanning/connecting
7. Interface with curriculum requirements	Interacting/incorporating
8. Assessment – validation	Reconciling/validating

A second element of authentic enquiry-based learning is the opportunity to develop the seven dispositions that together make up ‘learning power’: changing and learning, creativity, critical curiosity, learning relationships, meaning making, resilience and strategic awareness [7]. The development of these dispositions can be supported through mentored conversations around a self-assessment that learners carry out with the help of the Effective Lifelong Learning Inventory (ELLI). This self-assessment provides them with an ‘ELLI profile’, which provides a basis for reflection and future development [8].

EnquiryBlogger has been developed in order to help learners to develop their awareness on the dynamics involved in their enquiry process and to support reflection about the need for and development of related thinking and learning dispositions.

2 EnquiryBlogger

In order to do this, the first phase of *EnquiryBlogger* extended the core features of the open source blogging platform, Wordpress, in the following ways.

- **Enquiry Spiral** A Wordpress plug-in that can be added to the side panel of a blog. Learners use a pre-defined set of tags to indicate when they consider that a blog posting maps to one or more of the eight enquiry dynamics identified in Table 1. The widget provides a graphical representation of the enquiry, and clickable links allow learners and teachers to search within and across blogs to retrieve examples of, for instance, ‘questioning’.

- **ELLI Spider** This plug-in functions in a similar way to the Enquiry Spiral. Learners use a pre-defined set of tags to reflect self-perceptions of their own learning power. The resulting spider diagram provides a searchable graphic representation.
- **Mood graph** This plug-in reflects users' affective response to their enquiries. Learners can choose one of five emoticons to reflect their emotional state, ranging from ☹ to :-D. Once they choose an emoticon, they are required to provide a written explanation of their choice, which is recorded as a blog post. The resulting clickable graph charts changes in emotional state over time.
- **Teacher dashboards** Class teachers have access to a clickable dashboard overview of the EnquiryBlogger widgets of all pupils in their class. They can see at a glance how each enquiry is progressing, which learners are having difficulties and which learners are reporting success and high levels of reflection.

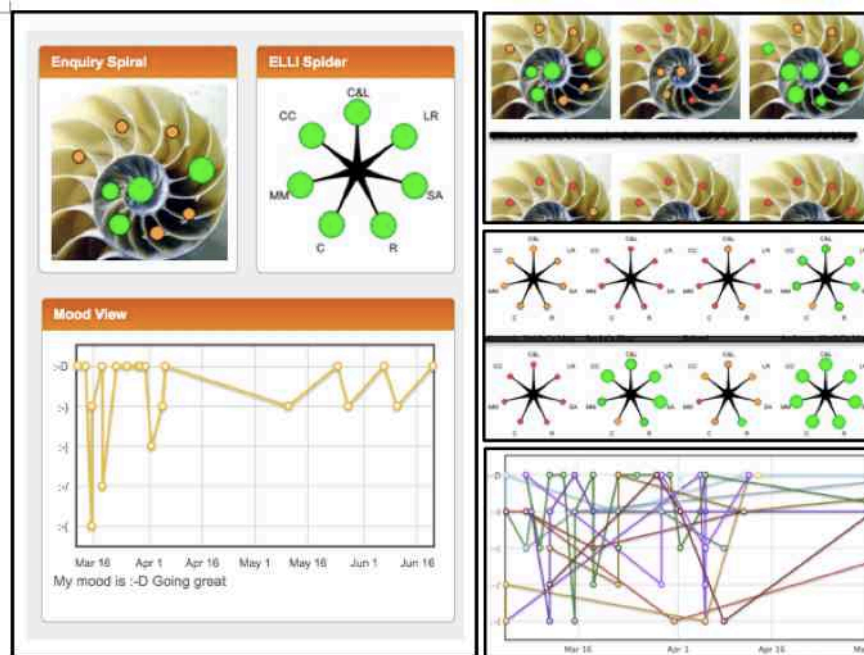


Fig. 1. Pupil's view of EnquiryBlogger plug-ins (left) set alongside sections of the teacher's dashboard view of class plug-ins (right)

Figure 1 shows a pupil's view of the EnquiryBlogger plug-ins (left) and a section of the teacher's dashboard view of class plug-ins (right). On the EnquirySpiral and the ELLI Spider, red dots mark a tag that has not been used at all, amber signals limited use of a tag, green indicates a tag that has been assigned to several posts and large green dots represent extensive use of a tag. The pupil on the left of Figure 2, for example, has indicated a good start to their enquiry, with some progress made on all

stages. This pupil appears to have reflected on all their learning dispositions on many occasions (though the teacher might want to check that this is focused reflection and not just indiscriminate use of a set of tags). The pupil has also recorded on 16 occasions that they are happy with the progress of their enquiry, particularly since the end of March.

The teacher's view on the right shows some of the variety within the class. The dashboard provides opportunities to initiate reflective discussion with individual pupils and with the class as a whole, as well as supporting reflection by the teacher (for example, why did several pupils consider that their enquiry was going badly during the first week of April?)

3 Feedback and Future Development

One secondary school class has been using EnquiryBlogger since March 2011, and users have been encouraged to provide feedback both through interviews and through their blogs. This feedback is being used to guide the next phase of development. No systematic analysis of feedback has yet been carried out, but sample comments taken from the blogs demonstrate that these tools are being used to support individual and collective reflection.

***Learner A:** In todays lesson i am going to give enquiryblogger a well deserved 10 on 10 because i think it is a great way to express your lerning and it is it gives you a chance to show your learning to your freinds and family(etc) also it is a great way to express your feelings on how ypu felt doing the chalenges.*

***Learner B:** I would give enquiry blogger a rating of 8/10 because it was like my own, kind of a, diary which people could comment on to give me some ideas.*

***Learner C:** I would give enquiry blogger 8/10 for helping me with my learning because I think that it's good for storing your information and for reflecting on your learning but sometimes it gets you very distracted with all the fonts and making posts that are pointless instead of finding new information. I think that the uploading the videos, recordings and pictures are good but they are quite hard to use as there are no instructions I think that if they put instructions on it would make it even better.*

***Learner D:** i will give enquiryblogger a 7 out of 10. i am giving it a seven because you can store all of your learning on it and it is better than writing. also if you are at home you can look at other people's blogs. people comment on your blog so they can tell you what to do or how to improve your learning and sometimes they tell you what you are doing wrong. . the problem is if you are trying to go on somebodys blog and you dont know how to spell their name then you cant see their blog. there should be a list of all the people on enquiryblogger*

Phase 2 of EnquiryBlogger will address the problems and issues raised by learners and teachers and will increase opportunities to develop awareness of the experiences

of others by providing easy access to the non-private postings of other class members. It will also allow groups of learners to make their own selection from a set of plug-ins, to customize their plug-ins and to change the appearance of those plug-ins.

4 Challenges Arising from this Research

EnquiryBlogger forms part of a set of ongoing work related to the rapidly growing field of learning analytics – the collection, analysis and reporting of data about learning in order to support and enhance learning experiences and the success of learners [9]. In this context, research challenges for the future include:

- How can we improve the clarity of data visualisations in order to support reflection by individuals and by groups of learners?
- How can we extend the use of similar tools to different groups and contexts?
- Is it possible to use data analytics from tools like this to provide learners with targeted recommendations that could support their learning?

5 Acknowledgment

Our thanks to Learning Futures, which funded The Open University and the University of Bristol to develop EnquiryBlogger to support enquiry-based learning.

References

1. Mortensen, T., Walker, Jill, http://www.intermedia.uio.no/konferanser/skikt-02/docs/Researching ICTs_in_context-Ch11-Mortensen-Walker.pdf
2. Ferguson, R., Clough, G., Hosein, A.: Postgraduate Blogs: Beyond the Ordinary Research Journal. In: Wheeler, S., Whitton, N. (eds.) Proceedings of the 14th Association for Learning Technology Conference (ALT-C 2007) Beyond Control: Learning Technology for the Social Network Generation, 179--189 (2007)
3. Efimova, L., Fiedler, S., Verwijs, C., Boyd, A.: Legitimised Theft: Distributed Apprenticeship in Weblog networks. In: I-know 04, Graz Austria (2004)
4. Du, H.S., Wagner, C.: Learning with Weblogs: An Empirical Investigation. In: 38th International Conference on System Sciences, Hawaii (2005)
5. Burgess, J.: Blogging To Learn, Learning To Blog. In: Bruns, A., Jacobs, J. (eds.) Uses of Blogs, pp. 105-114. Peter Lang, New York (2006)
6. Deakin Crick, R.: Inquiry-Based Learning: Reconciling the Personal with the Public in a Democratic and Archaeological Pedagogy. Curriculum Journal 20, 73--92 (2009)
7. Deakin Crick, R.: Learning How To Learn: The Dynamic Assessment of Learning Power. The Curriculum Journal 18, 135--153 (2007)
8. Deakin Crick, R., Broadfoot, P., Claxton, G.: Developing an Effective Lifelong Learning Inventory: The ELLI Project. Assessment in Education: Principles, Policy & Practice 11, 247--272 (2004)
9. Buckingham Shum, S., Ferguson, R.: Social Learning Analytics: Technical report, KMI-11-01. Knowledge Media Institute, The Open University, UK (2011)

Designing an Online Mentoring System for Self-Awareness and Reflection on Lifelong Learning Skills

Thomas Daniel Ullmann¹, Rebecca Ferguson¹, Simon Buckingham Shum¹, Ruth Deakin Crick²

¹Knowledge Media Institute, The Open University, UK

²Graduate School of Education, University of Bristol, UK

{t.ullmann|r.m.ferguson|s.buckingham.shum}@open.ac.uk, ruth.deakin-crick@bristol.ac.uk

Abstract: Mentoring supports the process of becoming self-aware of personal beliefs and to engage with a topic of concern in a reflective manner. With new media, also new opportunities and new means for mentoring have arisen. In this contribution, we outline how an established face-to-face mentoring process has been ‘translated’ into an online mentoring system. It outlines the design decisions made for an initial online mentoring system supporting mentees to gain self-awareness of and to reflect about life-long learning skills. The purpose of the development process was to detect the essential and the suitable elements for an online version of a face-to-face mentoring practice.

Keywords: online mentoring, self-awareness, reflection, personal learning environments.

1 Online Mentoring

While a huge amount of online mentoring websites exist, little seems to be known about the determinants of successful online mentoring [1,7].

Bozeman et al. define mentoring as “a process for the informal transmission of knowledge, social capital, and psychosocial support perceived by the recipient as relevant to work, career, or professional development; mentoring entails informal communication, usually face-to-face and during a sustained period of time, between a person who is perceived to have greater relevant knowledge, wisdom, or experience (the mentor) and a person who is perceived to have less (the protégé)” [2].

Online mentoring on the other side has to take into account the specificity of the medium used and its effect on the mentor-mentee relation. Bierema and Merriam emphasise in their definition the qualitative difference compared to face-to-face mentoring. They state that online mentoring can be seen as a “computer mediated, mutually beneficial relationship between a mentor and a protégé which provides learning, advising, encouraging, promoting, and modelling, that is often boundaryless, egalitarian, and qualitatively different than traditional face-to-face mentoring” [1]. In the following, we will use the term mentee instead of the word protégé.

This paper will provide insights gained from the process of transferring an established face-to-face mentor-mentee programme into a first online solution, called ELLIMent. It is clear, that an online solution cannot be a one-to-one translation. We will therefore outline the major design decisions addressing requirements gathered in expert interviews.

2 The Effective Lifelong Learning Inventory

The Effective Lifelong Learning Inventory [5,6,4] is a self-report questionnaire designed to identify how learners perceive themselves in relation to key dimensions of effective lifelong learning (learning power). It evolves from research aiming to identify key skills for lifelong learning. The instrument was trialled on a large scale and the researches found a stable pattern of seven dimensions. The dimensions are: (1) changing and learning (a sense of myself as someone who learns and changes over time), (2) critical curiosity (an orientation to want to 'get beneath the surface'), (3) meaning making (making connections and seeing that learning 'matters to me'), (4) creativity (risk-taking, playfulness, imagination and intuition), (5) learning relationships (learning with and from others and also able to manage without them), (6) strategic awareness (being aware of my thoughts, feelings and actions as a learner and able to use that awareness to manage learning processes), and (7) resilience (the readiness to persevere in the development of my own learning power)¹. These dimensions serve as one of the major reflection points within the ELLI face-to-face mentoring process, and were the basis of our research of how this process could be applied for online environments.

The questionnaire consists of 72 items. The results of this online instrument are represented as a spider diagram, showing the seven dimensions of learning power. This representation can then be used as a starting point to engage in a mentoring relation. A programme for becoming an ELLI mentor exists and several institutions (universities, schools, industry) offer this service to students/employees.

3 Requirement Analysis

ELLIMent was developed as a research prototype for the SocialLearn project² of the Open University to evaluate its applicability and possibilities in the context of social learning [3] - a personal learning environment scenario. The development process of ELLIMent followed an iterative process with close feedback cycles. To better understand the needs and the pivotal elements of the ELLI mentoring process, expert interviews with five mentors were conducted.

The experts interviews lead to several scenarios, the latest one is presented here:

In the beginning the mentee filled out the ELLI questionnaire. They then choose a mentor to reflect about the ELLI results, by logging into SocialLearn using a

¹ <http://www.ellionline.co.uk/>

² www.open.ac.uk/sociallearn

dedicated ELLIMent tab. There the mentee can select a mentor from a mentor list. The mentor can accept or reject the offer of the mentee. After the assignment, the mentor helps the mentee making sense of the dimensions of ELLI. The mentor and the mentee will see the spider chart of the mentee as a starting point for the reflection process. The mentoring session could take place face-to-face, per telephone or within SocialLearn. After the meeting, the mentor and mentee summarize their reflections in textual form. The mentor should be able to send the mentee a message with suitable interventions to develop their skills. The mentee should be able to view its spider chart with the whole history of reflections and instructions of the mentor. The mentee will be able to store reflections in the history and to modify the spider chart either to signal the mentor the need for new interventions or to save the personal view of the ELLI dimensions. Every change will notify the mentor about updates of the history of the mentee. The mentor should be able to send advice and feedback to the mentee and have an overview of the mentee's reflections and spider charts.

The mentor and mentee are in a mutual feedback situation. The mentor and the mentee agree on development steps of one or more lifelong learning skills, the mentor gives advice and feedback and the mentee gives the mentor feedback about the process.

This served as a first requirement analysis and supported in developing first mock-ups. The figure below shows the mock-up of the mentor's view. From the left to the right it contains the following widgets or components:

1. A list of mentees a mentor can select from
2. The history of the mentee, showing information for example about given advice, with whom the mentee worked together, used learning resources, and learning outcomes.
3. The spider diagram of the mentee showing the results of the ELLI questionnaire.
4. Similar mentees and their history, which could help to give insights about their progress and which advises were successful.
5. Similar learning resources, which could serve as an indicator for the mentor of which resources could be helpful for the mentee for developing lifelong learning dimensions.
6. Target ELLI spider chart. Enables the mentor to see the targeted lifelong learning skills of the mentee, which will also show similar mentees with this target and their history.
7. Messaging interface, allowing the mentor to write messages to the mentee.

Designing and Online Mentoring System

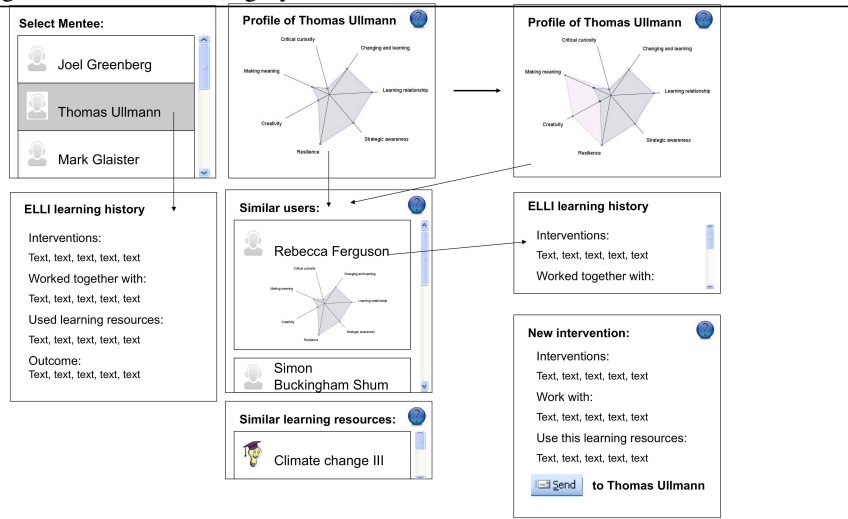


Fig. 1: Mockup of the mentor perspective

The next figure shows the perspective of the mentee. On the left it shows the ELLI spider chart of the mentee and recommended friends and resources according to this type of lifelong learning skills profile. The right hand side shows the possibility to modify the chart to express the target state in which the mentee wants to develop its profile in future. Again with recommended resources and friends suitable for the target configuration. The mentee can select a mentor to help him with this task.

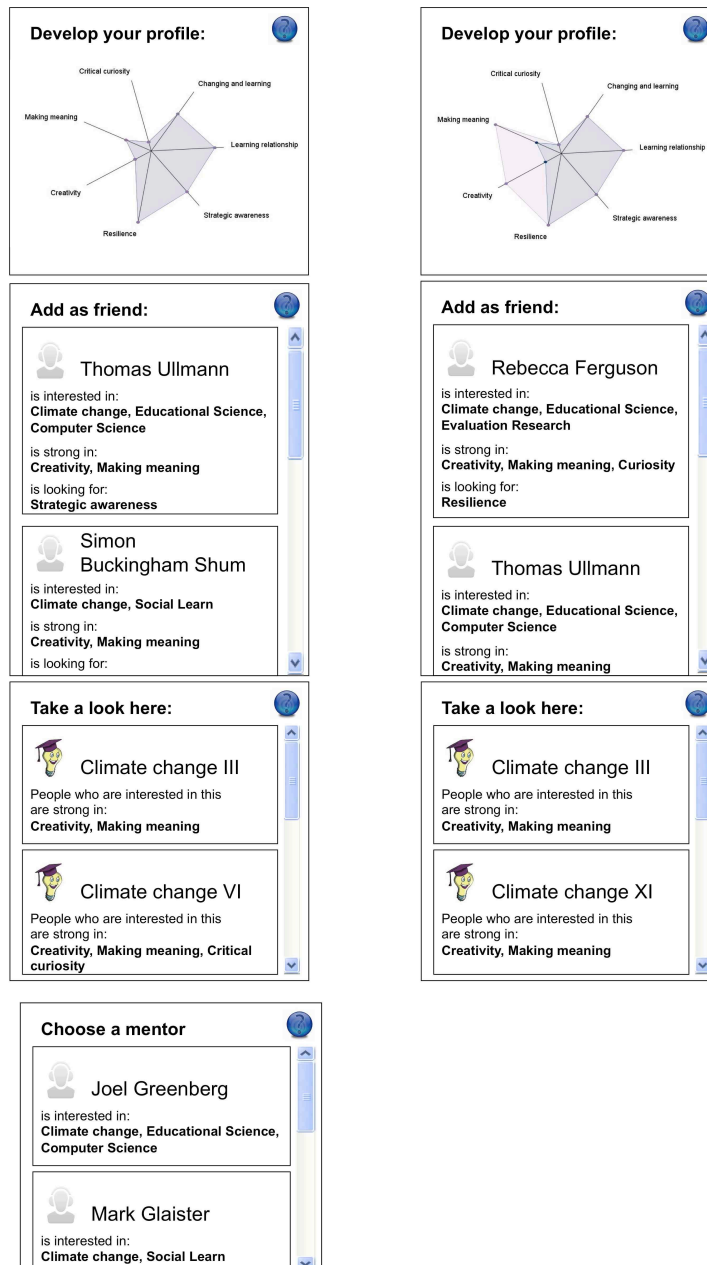


Fig 2: Mockup of the mentee perspective.

The mock-ups were used to gather further feedback and to refine the design, and indeed the mock-ups sparked further ideas for the development of the tool:

- The intervention can be group-based or mentee centred. Group-based means that the mentor can prepare an intervention for a group of people, who will then work together to achieve the goals of the intervention.
- The information from the SocialLearn learning environment could suggest recommendations of mentees, which match the personality of a mentee according to the ELLI dimension. The mentees can build learning groups and learn from each other.
- Instead of an automatic recommendation generated through the environment, the system could support the mentor by providing for each mentee a set of mentees, who match each other in an empowering way according to their ELLI dimensions. Besides the matching of mentees, also content of SocialLearn could be recommended according to ELLI dimensions. For example, the system could recommend learning resources that foster creativity to mentees who want to become more creative.
- Mentors can be provided with a set of similar mentees based on the ELLI dimension. The mentor can compare the interventions for the similar users and assign the same or adjusted interventions to the new mentee.
- Problems with the above-mentioned ideas could arise from the fact that the facets of the mentor-mentee relationship are too complex to model in a knowledge-based system. One mentor pointed out that the choice of intervention, based on the discussion with the mentee about the ELLI dimension is strongly dependent on the personality and actual situation of the mentee. The interventions must be therefore highly tailored to the personality. One challenge will be to find the balance between what parts of the recommendation could be supported with intelligent algorithms, and which ones would have to be done by experienced mentors.
- Tool support would be helpful for helping the mentor and mentees with scheduling their calendars for meetings.
- Filter mechanisms will be necessary to support the mentees in finding suitable mentors (e.g. filters for location, availability, interventions they offer, etc.).
- Regarding the graphical representation of the ELLI dimensions, one idea is to provide different sorts of visualizations to the mentees according to their experience and understanding of the ELLI dimensions. The mentors could be supported with views outlining the development of a mentee.
- SocialLearn could provide for the mentees special learning paths about ELLI, with a set of general reflection points of how to enhance the ELLI dimensions. Mentors can then point mentees to suitable learning paths.
- Mentees can also subscribe to a daily service delivering ELLI “wisdoms” that are statements about the ELLI dimensions helping mentees to develop their personality. There could be a pool of general statements from which the mentees can see every day a random “wisdom” or one tailored to their ELLI profile.
- The tool could be also used for the mentors’ supervising needs. The spider charts and the recorded history can serve as a foundation to reflect about best practice. Suitable visualizations can reveal long-term trends in the development of the personality.
- In addition, legal aspects, especially privacy issues have to be addressed.

4 Implementation of ELLIMent

One of the design goals of ELLIMent was to provide easy access to a network of ELLI experts, who are specialized in the mentoring process of lifelong learning skills. The challenge was to identify crucial reflection points, which were useful for an online mentoring session, helping to focus on the actual state of lifelong learning skills, while allowing for communicating about future development plans. As the interviews during the design process with ELLI experts confirmed, there is a primacy of seven learning power dimensions as given by the ELLI questionnaire. Based on the gathered requirements a first system was implemented as a Java Applet. The implementation focused on the core requirements (due to time constraints). The following figures provide a walk-through of the components of the system. After logging into the system, either the mentor or mentee view is presented. The data for the spider diagrams are retrieved using a Webservice.

- The mentor can select from a list of all mentees, who have agreed to be mentored by this mentor.
- By selecting a mentee, the mentor can see its spider diagram, as well as previous saved states of the diagrams.
- The history shows all the reflection process of the mentee and all of the advice given by the mentor that is not set as private by the mentee.
- The mentor has the possibility to write a reflection, which can be visible for the mentee or only visible to the mentor.
- The mentor can write an advice to the mentee.

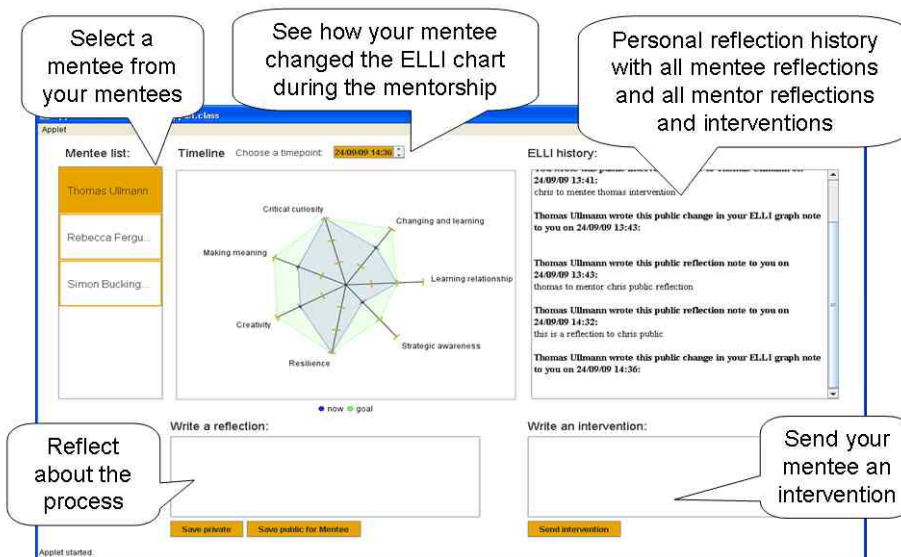


Fig 3: The mentor view.

The mentee view shows a similar picture. The mentee can subscribe to a mentor from a list. A mentee can manipulate its spider diagram indicating, which lifelong-learning

skill to target in future. All saved diagrams are stored and can be retrieved with the timeline. Reflection can be either private or can be made visible for the mentor. The history shows all reflections of the mentee, and advises and reflections of the mentor.

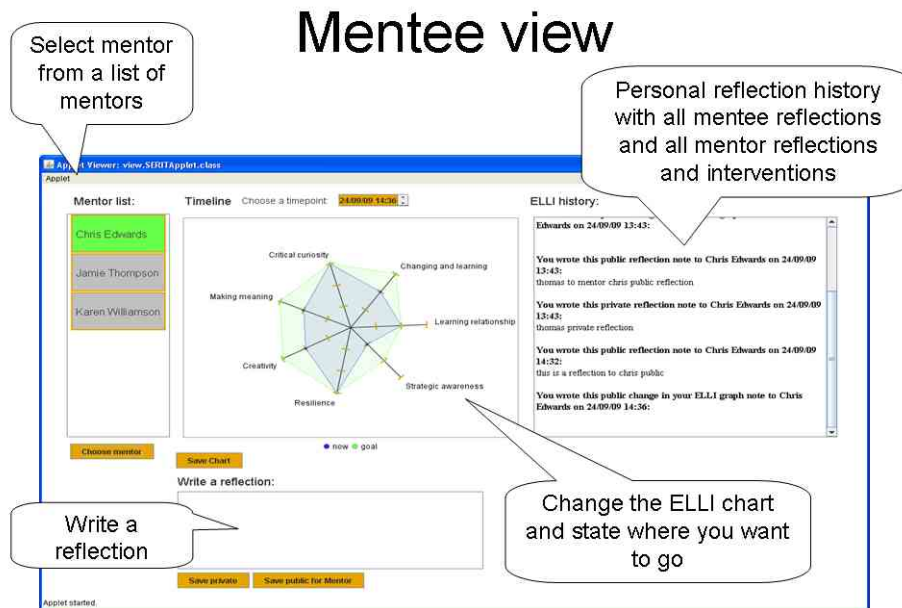


Fig. 4: The mentee view.

5 Conclusions

In summary, ELLIMent is an online tool, based on the ELLI inventory, which aims to support mentors and mentees in reflecting on their disposition for lifelong learning. It helps to organize the workflow between mentors and mentees through (1) keeping lifelong learning dispositions at the heart of the reflection process, (2) enabling mentors and mentees to exchange reflection and action notes, (3) enabling mentors and mentees to determine which reflections they share with each other and which they keep private, and (4) keeping track of the history of the mentoring sessions.

Based on the experiences with the first research prototype of ELLIMent, a new version is currently under development with a deep integration of some of the concepts of ELLIMent into the ELLI infrastructure, including ELOISE, the online questionnaire system, and the learning warehouse infrastructure³.

³ <http://www.learningwarehouse.org/web/guest/about-lw>

6 Acknowledgements

This work would not have been possible without the help of the SocialLearn and the Bristol team. Special thanks go to Chris Edwards (The Open University), Ruth Deakin Crick (University of Bristol - GSE), Tim Small (ViTaL Partnerships, Bristol), Michael Hush (The Open University), Karen Williamson (University of Northumbria), and Tim Crick.

7 References

1. Bierema, L.L., Merriam, S.B.: E-mentoring: Using computer mediated communication to enhance the mentoring process. *Innovative Higher Education*. 26, 3, 211–227 (2002).
2. Bozeman, B., Feeney, M.K.: Toward a Useful Theory of Mentoring. *Administration & Society*. 39, 6, 719 -739 (2007).
3. Buckingham Shum, S., Ferguson, R.: Towards a social learning space for open educational resources. Presented at the OpenED2010: Seventh Annual Open Education Conference, 2-4 Nov 2010 , Barcelona, Spain (2010).
4. Crick, R.D.: Learning how to learn: the dynamic assessment of learning power. *Curriculum Journal*. 18, 2, 135–153 (2007).
5. Crick, R.D., Yu, G.: Assessing learning dispositions: is the Effective lifelong learning inventory valid and reliable as a measurement tool? *Educational Research*. 50, 4, 387–402 (2008).
6. Crick, R.D., Broadfoot, P., Claxton, G.: Developing an Effective Lifelong Learning Inventory: the ELLI - Project. *Assessment in Education: Principles, Policy & Practice*. 11, 3, 247 (2004).
7. Ensher, E.A., Heun, C., Blanchard, A.: Online mentoring and computer-mediated communication: New directions in research. *Journal of Vocational Behavior*. 63, 2, 264-288 (2003).

Introducing Feedback Mechanisms to Users of Higher Education ePortfolios

Philip Meyer¹, Thomas Sporer²

¹ Knowledge Media Institute, The Open University UK
p.meyer@open.ac.uk

² Institute for Media and Educational Technology, University of Augsburg
thomas.sporer@its.uni-augsburg.de

Abstract: The University of Augsburg offers an optional study programme, in which students acquire key competencies through participating in informal, self-organised project work. The learning design of this programme builds on the students' reflection of the project experiences with regard to their competency development. The reflection also serves for assessment purposes and is organised via an ePortfolio system (www.begleitstudium.imb-uni-augsburg.de). This paper presents research, conducted in order to enhance the portfolio-based assessment. Especially, more advanced feedback mechanisms have been proposed in a scenario approach. Qualitative interviews with students show that feedback is only desired under special circumstances. Acceptance factors as identified in this explorative study are in particular prior experience, privacy concerns and relevance for grading.

Keywords: ePortfolio, feedback, assessment, higher education, informal learning, university, curricula, project based learning, reflection, privacy

1 Terminology and Context

In the study at hand, the term “feedback” refers to any written comments, which are provided to the learner by peers or supervisors in a technology-enhanced learning environment. This includes formative feedback during the process of portfolio writing, as well as summative feedback on the student's reflections about their experiences within the projects. The former type of feedback is not connected to grading and serves the assessment for learning rather than an assessment of learning [Häc05]. The latter is an essential part of the grading process. It is provided by a supervisor and is based on certain feedback criteria [SSM10].

Several authors stress the importance of a constant, formative feedback for portfolio writing [Big99]. Therefore several scenarios, considering how this feedback could be implemented in the ePortfolio system, have been elaborated. These involve different persons giving the feedback (project peers, supervisors), different content types (personal reflections, work results) and different degrees of curricular integration (non-mandatory, mandatory). Before the actual implementation of the feedback mechanisms, interviews with students who participate in the programme were conducted in order to grasp the value of these scenarios for the student's learning process [Mey09]. The goal of this explorative study was a prioritisation of feedback implementation, since there were not enough development capacities at hand for implementing them all at once.

For the interviews, two groups (n=2x5) of students have been questioned about their attitudes on feedback addressing their ePortfolio work. All of them were participants of

the study programme and had received feedback from a supervisor at least once before the interview. One group, however, just had begun to participate in the programme; the other group was about to finish their bachelor's/master's degree.

2 Student View on Feedback Mechanisms

The more experienced participants were generally open towards the feedback scenarios to a greater extent. They favoured those scenarios, which provided feedback for the actual project work rather than on the quality of reflection. The latter was often regarded as unnecessary for themselves. Especially for those forms of feedback, where project peers were involved, the optional character was emphasised to minimise the work load for the project members. Less experienced participants however favoured peer review scenarios, also helping with questions of how to write reflections. From their side, feedback on work results was a common request, too. The study furthermore revealed that privacy is a big concern for the students, as some content was in general seen as something private. A possible explanation here is a “fear of grading”, meaning that there is confusion on who can see the contents of the portfolio and if it is relevant for the final grade. It proved important to address those concerns more prominently. Also, mandatory feedback was regarded as too time-consuming, so the “burden” of giving feedback should be shared by all stakeholders involving lecturers, students and project leaders.

3 Future Outlook and Conclusions

The results of this study suggest that the main challenge, when implementing feedback mechanisms into ePortfolio systems, is to balance the workload for the hands-on project activities with the workload for reflection and documentation of project work. Rather than building solely on the assessment of learning in terms of formal regulations, informal incentives need to be addressed. In this regard, easy to use and attractive tools, which integrate seamlessly into other internet services like Skype, Facebook or Twitter, could be incorporated. However, private spaces on university servers must remain part of this tool. Mash-up personal learning environments could bridge the gap between the formal and informal aspects of reflective learning as well as different kinds of assessment feedback. Due to a lack of funding the proposed feedback mechanisms were not implemented and hence could not be evaluated in practice. For future research, it would be interesting, to see a.) under which circumstances appreciation for the relevance of feedback mechanisms can be achieved and b.) to what extent a more interactive design with the potential to raise awareness would influence motivation as well as the quality and authenticity of personal reflections.

References

- [Big99] Biggs, J.: *Teaching for quality learning at university: What the student does*. Buckingham: SRHE / Open University Press, 1999.
- [Häc05] Häcker, T.: *Portfolio als Instrument der Kompetenzdarstellung und reflexiven Lernprozesssteuerung*. URL: http://www.bwpat.de/ausgabe8/haecker_bwpat8.pdf, 2005
- [Mey09] Meyer, P.: Feedback und E-Portfolios für das Kompetenz-Assessment im Hochschulstudium. *w.e.b.Square*, 03/2010.
- [SSM10] Sporer, T.; Sippel, S.; Meyer, P.: E-Portfolios als Assessment-Instrument im Augsburger Begleitstudium Problemlösekompetenz. *Zeitschrift für Medienpädagogik (18)*, 2010.

Position Paper: Developing Effective Peer-to-Peer Support Mechanisms for Large Scale Distance Learning Programmes

Dr Steven Warburton

University of London International Programmes, Stewart House, 32 Russell Square,
London, UK.
steven.warburton@london.ac.uk

Abstract. This is a short position presented at the Awareness and Reflection in Personal Learning Environments (ARPLE11) workshop. It details one of the areas of interest to researchers and practitioners working with University of London distance education courses delivered through International Programmes.

Keywords: peer-to-peer; study-groups; scalability; distance-education; personal-technologies;

1 What are you Researching?

We are interested in identifying tools and practices that can promote successful online peer supported learning. Our case-story has the following key characteristics:

Context: We have a globally targeted portfolio of distance learning programmes delivered to a large number of students. Some students are helped in their studies to varying degrees e.g. from lectures to library provision via affiliate teaching institutions, while others follow a more traditional study-alone pathway.

Problem: There are limited opportunities for social interaction for learners who follow the study-alone pathway. The lack of social interaction and social scaffolding impacts negatively on the student learning experience and can reduce their motivation, achievement, retention and progression. The problem space we are researching relates to can we support study-alone student in finding (and taking advantage of) opportunities for peer learning and reflection at a distance.

Solution: One of the solutions we are investigating is to encourage students to organise themselves into study groups and encourage them to engage with a suite of platforms and services, that could be their PLE/PLN, to support this activity space. The question remains, what is needed to help develop, nurture, motivate and sustain such an online study group?

2 What are the Challenges of Your Research?

- Finding scalable solutions to supporting learners when working with large student numbers (from 1000 to 52,000);
- Addressing a global student population that crosses multiple time-zones and therefore impacts on, for example, choices between synchronous and asynchronous platforms and highlights cultural differences e.g. in approaches to study;
- Gathering meaningful baseline data on student digital literacy;
- Working with a limited central support resources and therefore finding innovative ways share good practice and in some areas outsource business processes;
- Determine effective criteria for segmenting our market and therefore be better able to provide flexible as opposed to one size fits all solutions;
- Discover ways to work sensitively across the informal/formal educational divide e.g. communicating openly with students yet respecting the boundaries of student-led spaces;
- Understanding the role of design in building any type of solution and developing design patterns as abstractions of transferable successful practice.

3 What Should We as Workshop Participants Focus On?

- i. We are interested in the idea of propagating self-support mechanisms for distance students using a PLE-type approach and understanding more about the ways in which awareness of other actors in a network (both people and objects) can eventually lead to action and reflection on learning through a the cycle of: *Presence – Connection – Awareness – Action (Support/Share) – Reflection*;
- ii. Documenting/capturing successful practice in a form that encourages transferability to similar contextual problem spaces.

4 What is on the Research Agenda of the Next Five Years?

That is a big question. Areas that we would like to see included in such an agenda are:

- How does increased visibility of emotional expression impact on online group cohesion and motivation?

- How can we make skills and competences more visible in collaborative or cooperative learning settings e.g. by exploring micro-certification and self-presentation of skills routes?
- What avenues are most effective in developing peer assessment and evaluation skills in learners?
- What do we mean by the term 'digital literacy' in a post-digital world?
- How can tutors and students become designers in their approach to teaching and learning?