Networked Scaffolding: Seeking Support in workplace learning contexts

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Abstract

The overall objective of WP2 (work-package of Learning Layers, the European research project in Technology Enhanced Learning) is one of designing solutions for scaffolding learning in networks. Specifically, this means developing designs and tools to scaffold help seeking learning in a networked workplace context. This paper presents the conceptual research of the 1st year (WP2). We provide a theoretical discussion around the concept 'Networked Scaffolding', and illustrate our research ideas through a specific case study 'Seeking Support' in the Healthcare context. Social Network Technologies, the focus of this paper, scale personal interactions by extending and augmenting the reach of personal networks, and form a central part of the Learning Layers integrated systems view on scaffolding informal learning at the workplace. In this context, semantic technologies are used to scale the representation and generation of meaning. In particular, we focus our study on an illustrative case of the Healthcare context in UK. Specifically, we are interested in studying how professional exchange trusted learning opinions, becoming more the norm in professional settings, developed around intentional networks that are constantly managed and reconstituted as Personal Learning Networks. The significance of mobile technology to enable and support these processes is an important aspect of this research. Indeed, there is still a lack of research in this field (i.e. scaffolding networked learning on a large scale for work-based learning). However, some authors such as Sandars, Langlois, & Waterman (2007) provide some very useful insights into online collaborative learning within Healthcare that is particularly helpful for developing theory around mobile technologies that healthcare professionals will be using within this research. Regarding the topic of Social Network Sites (SNS), we elaborate the concept of "Networked Scaffolding" with the aim of understanding how scaffolding has to be applied in SNSs with a work-based context. For this reason, in this paper we review how technology is currently being used in work-based learning contexts and the main related approaches. In the next section we present and discuss the theoretical and technological foundations related to the Networked Scaffolding concept proposed. Then, we show the application of our ideas through a design team called PANDORA which aims to scaffold seeking support in the Healthcare context. A summary of the co-design activities and the preliminary outputs are presented. Finally, we conclude with next steps to be done in future work

Keywords

Networked scaffolding, workplace learning, Personal Learning Networks.

Networked Scaffolding

Social Network Technologies have the potential to scale personal interactions in learning. Rather than relying on those people that happen to be in physical proximity or currently available, Social Network Sites (SNS) extend and augment the reach of personal interactions. A study published in 2012 by McKinsey & Company found that the use of social networking within companies could increase the productivity of "knowledge workers" by 20 to 25%: "Two-thirds of this potential value lies in improving collaboration and communication within and across enterprises. When companies use Social Media internally, messages become content; a searchable record of knowledge can reduce, by as much as 35%, the time employees spend searching for company information." (Chui et al., 2012). The following sections review how understanding the main characteristics of SNS, Social Media and people tagging can be beneficial to support Professional Learning Networks. Merchant (2012) considers the way in which SNSs support public displays of friendship and connections to be one of their unifying features: "the patterning and flow of communication, friendship, intra- and inter-group behaviours as they are enacted in and across different geographical locations and over time" not mediated by Social Media. This notion that SNSs have the potential to include people beyond currently existing social networks seems to us to be an important characteristic. The existing literature on Social Media suggests that at best more work is required to maximise the potential of their affordances for learning in such formal contexts as the workplaces (Cook & Pachler, 2012). In particular, there is a growing body of work that investigates the use of mobile devices in the sensitive area of professional networking support for Healthcare workers (Norman, 2011).

People Tagging

Tagging, ostensibly, enables users of Social Media to add labels to digital resources or people (e.g. profiles) in order to help them refer to them easily at a later point (Cook & Pachler, 2012). Fundamentally, two types of tagging can be distinguished: 'Folksonomies', a user-driven, collective system of classification, and 'Ontologies', classifications determined by a system and/or its providers. One immediate challenge arises around the descriptors to be used to characterise people in their Learning Network through tags particularly given that the knowledge embodied in people remains often tacit, is normally multifaceted and usually is liable to frequent change. Farrell et al. (2007) suggest one cannot rely on each employee to create, and keep their profile up-to-date but needs to seek "to leverage the work of a few active taggers". Social Network approaches to workplace learning have tended to focus on describing and augmenting employee profiles from the perspective of those profiles being used for expert finding and community formation. Further, in some of these approaches, the principle of social tagging and bookmarking is transferred to people (e.g. Linkedin http://www.linkedin.com/, Xing http://www.xing.com/). In this line, Rajagopal et al. (2012) offer a conceptualisation on "the act of making connections with other professionals" and the skills associated with it such as maintaining and activating Personal Learning Networks (PLN). A key to these skills, they argue, is "the ability to identify and understand other people's work in relation to one's own, and to assess the value of the connection with these others for potential future work". Clearly, technology in general, and SNSs in particular, have a valuable contribution to make in the process of creating PLNs of people distributed across groups and places and various degrees of connectivity and interconnectivity. In this sense, people tagging can be seen as one advanced functionality supporting the learning process in and through PLNs and especially a useful mechanism to improve trust among professionals. Specifically, one of the main focuses in WP2 is to understand how aggregated trustworthiness can be built and supported to improve interactions among people in professional Learning Networks.

Aggregated Trust in Social Networks

Different definitions of trust identify the analysis of interactions among people as a key issue for the initiation of cooperative tasks. It should be noted that we are interested in studying trust from a behavioural perspective in workplace learning networks. According to Victor, Cornelis, & De Cock (2011) Trust Networks are those where entities augment the edges of the network by interacting with other entities and building trust connections. In these networks many individuals do not know each other, there is not a central authority and sometimes participants can provide contradictory information. In related work Jessen & Jørgensen (2011) propose that a certain piece of information is perceived as credible when the following factors are combined: (1) Social Validation: a high number of people acknowledge a certain piece of information as trustworthy; (2) Personal profile: the members of the network provide an identity online (e.g. LinkedIn profile); (3) Authority & trustee: a source of information is supported by an authority on the matter or trusted members. The authors define 'perceived credibility' as the degree to which people believe the information presented. Furthermore, Manca and

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Ranieri (2013) propose three main types of information to mediate the presence of individuals in SNSs: 1) personal information; 2) the online social context; and 3) online interactions. As the authors claim, at the moment, there are no automatic or semi-automatic measures to communicate 'trust' through interactions on SNSs. For this reason, inferring trust remains one the most important future research areas in SNSs and is an important aspect in our research. Indeed, Rashed et al (2012) claim that trust is context-dependent. This means that an individual can trust a colleague in a specific working setting, while she does not trust him when other topics are encountered. As a solution some authors propose that we can compute the level of trust in a network establishing global and local trust metrics (e.g. Golbeck, 2005). On the one hand, global trust metrics take into account all network members' data and trust connections among them (we used the term Shared Learning Network to define this type of situation). On the other hand, local metrics take into account personal bias to compute personalized trust (i.e. PLNs). One successful technique to building trusted online environments is gathering data from Social Network profiles and traces from the Internet to drive recommendations. Recommender systems have traditionally used this technique, with commercial success, in order to recommend products to users based on their public personal traces on the Internet. Liu & Maes (2005) propose the use of the same concept to interconnect people with similar interests and identities by using an interactive map. By applying the context of emergent cultural patterns, the system proposes recommendations. This is a good example illustrating how semantic analysis can be applied to capture the interactions among people and provide scaffolding in professional learning networks though recommendations (based on information such as tags). Given the above perspectives, our objective is to combine people tagging and semantic analysis to enhance the building, maintenance and activation of interactions among people in a PLN. This is studied through the design and analysis of the Help Seeking tool presented in the next section.

Case study: Seeking Support in the Healthcare context

In Learning Layers WP2, we have focused our design research (Cook, Bannan & Santos, 2013) thus far on the study and understanding of the Healthcare sector (specifically GP practices in North East England) through the PANDORA design team. The PANDORA Design Team emerged from the Layers Open Design conference in March 2013 and has subsequently engaged in iterative co-design redefinition. The co-design approach has been selected as the most suitable, because it is necessary to identify the user needs and problems, especially because it is a context where many staff are not confident about the use of technologies. The work has also been influenced by the ongoing empirical study of how healthcare professionals currently learn in the workplace. Several "systemic pain points" (areas in the healthcare professionals' workplace learning where they feel they currently encounter problems) have been identified. These include: (1) Lack of time and mobility issues. (2) Cascading Learning & Training: ensuring that new national guidelines (or other learning resources) are shared, understood and implemented within the practice. (3) Cross-organizational working and learning: learn from each other's experiences when developing their implementation plans. (4) Support exchange of opinions and discussions: the formal procedure is followed to bring together face to face the relevant healthcare professionals to review a significant event. Some staff have suggested that there could be benefits to opening out these discussions more widely (across the practice and potentially even to other practices). (5) Nurses/Healthcare assistants mainly rely on face to face support and help seeking, meaning that they are restricted in terms of who they can ask especially as opportunities for taking time away from the clinic to attend cross-organisational training or networking events are limited. Finally, (6) Trust has been found to be a key aspect when seeking support , but which are the specific aspects of Trust that need to be considered when individuals move from local trusted PLNs out into wider SLNs?

Our hypothesis is that discussions will take place within PLNs and in a more organizational level through SLNs. These networks play a key role, and therefore we take the view that the development of those networks, and the associated help seeking and support in such networks, requires scaffolding. As a consequence a cross-organizational distributed cognitive learning network will be potentially established. For this reason, our focus is on developing a 'large scale networked scaffolding tool' which will involve consideration of semantic analysis to scaffold participations in professional learning network sites. One common theme across all the problem areas identified above is that the outcome of the discussions should result in improved knowledge and understanding within individuals as well as potentially leading to improved practices/procedures within the organisation. Based on the understanding of the Healthcare context and systemic pain points gathered from the empirical research and co-design workshops, WP2 is creating what we call prototype 1 (Learning Layers is a 4 years project, and prototype 1 is design artifact of the 1st year) for larger scale networked scaffolding (see http://odl.learning-layers.eu/seeking-support-prototype/). The Help Seeking tool envisaged usage as an app where staff can create their own PLN by tagging people and learning resources (e.g. questions/answers,

guidelines). Semantic analysis of the exchange of questions and corresponding tags will be applied by using the Learning Layers Social Semantic Server (Kowald et al, accepted; Seitinger et al, accepted) and relevant resources (i.e. guidelines, notes, similar questions & answers and people with recognised expertise in this area) will be recommended. We propose to use mobile devices to support the collaborative seeking of support brought about by the lack of time and mobility issues of staff.

Conclusions and Future Work

This paper presents the 1st year conceptual research conducted by WP2, within the Learning Layers project, which aims to provide a critical examination, discussion and analysis of research in networked learning in the workplace. The paper discusses how the combination of learning networks, people tagging and the building maintenance and activation of trust can be used as mechanisms for scaffolding to enhance the exchange of knowledge and discussion in informal learning contexts at the workplace. In order to understand better these critical research ideas, we apply co-design activities with clinical staff in the Healthcare context. Our future plans include evaluating and iterating our prototype (year 2014) by populating the system with real data, and scaling up the system (year 2015) to other workplace sectors (i.e. Construction) to identify systemic pain points that are necessary to consider when supporting Networked Scaffolding in workplace contexts.

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