LE SOCIAL SOFTWARE COMME OUTIL POUR LA CONSTRUCTION ET GESTION DE CONNAISSANCE DANS L'APPRENTISSAGE COLLABORATIF

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Abstract:

(EN)

When knowledge technologies change so radically, they change not only "what" we know, but also "how" we come to know (Laurillard, 2003). When asking ourselves: "how do we access knowledge?" we can answer "through blog micro-content, through personal and enterprise knowledge-blogs". When asking ourselves "how do we attribute meaning to information?" we answer: «all together», through social bookmarking tools. This work analyses a Learning and Knowledge Landscape dealing with different practices from Informal Learning – sustained by Web 2.0 technologies. We therefore aim at addressing the *knowing knowledge* issues as needed substrate for the lifelong learner in the socio-technical system in the Knowledge Society. Authors' current experience of using social software in knowledge co-construction and management in post-graduate curricula is also illustrated.

(IT)

Quando le tecnologie della conoscenza cambiano così radicalmente, esse cambiano ciò che conosciamo, ma come arriviamo a conoscerlo. Alla domanda «come ci arriva la conoscenza?» rispondiamo «con i micro-contenuti dei blog, con i knowledge-blog personali e aziendali». Alla domanda «come diamo significato all'informazione?» diciamo: «tutti insieme», con gli strumenti del social bookmarking. Il lavoro indaga un Learning e Knowledge Landscapes che raccoglie le diverse pratiche afferenti all'Informal Learning - e sostenute dalle tecnologie web 2.0 - per meglio rispondere al *knowing knowledge*, necessario substrato che accompagna il soggetto in formazione durante il suo percorso di Life Long Learning, all'interno di un sistema socio-tecnico come si rivela essere la Società della Conoscenza. La sperimentazione in atto introduce i social software nella co-costruzione e nella gestione della conoscenza in un contesto di master.

(FR)

Lorsque les technologies de la connaissance changent ainsi radicalement et rapidement, elles changent ce que nous connaissons, mai aussi le modalité avec laquelle nous arrivons à connaître. À la question «comme

se crée-t-elle la connaissance?» nous répondons «avec les micro contenus d'un blog, avec le knowledge-blog personnels et d'entreprise ». À la question «comme donnons nous signification à l'information?» nous disons: «tous ensemble», avec les "outils" d'un social bookmarking. Ce travail, adresse le domaine du Learning et Knowledge Landscape, en essayant de réunir les pratiques le plus différentes afférentes à l'informal e-Learning - et qui sont soutenues par les technologies du web 2.0 - pour mieux répondre aux procès de "Knowing Knowledge". Le procès de "connaissance de la connaissance" est un substrat nécessaire qui accompagne le sujet en formation pendant le parcours de Life Long Learning, à l'intérieur d'un système socio-technique comme se révèle être la Société de la Connaissance. L'expérimentation en acte introduit les social software dans la co-construction et dans la gestion de la connaissance dans le conteste d'un master universitaire.

Mot-clés : networked learning, collaboration technologies, collaborative learning, informal learning, learning 2.0, web 2.0, personal learning environment, connectivism.

1 INTRODUCTION

The continuous and radical change characterising knowledge technologies is not only affecting what we know but – most important – it changes the way the tools, relations and interactions through which we come to know and learn both as individual and collective subjects.

Under this perspective, this work highlights some issues related to the process of meaning making in the landscape of socially shared and co-created information. In this work we explore a learning and knowledge landscape which merges different practices which constitute the information and open dimension of learning to provide an answer to knowing knowledge needs (Siemens, 2006) and which proposes itself as an essential characteristic for the experiential and relational growth of the subject.

Settling up tools and environment to support online learning is a crucial activity, because of the relational, continuous and recursive nature of the learning process. In this direction, we try to focus the attention on the recognised growing importance of social software in formal learning as a pedagogical middleware endowed of sense and harmonically used in the formal education workflow to promote individual and collective moment of reflection and meta-cognition.

The introduction of social software in formal education, favours the creation of an open and socially shared information space which nurtures the relational and meaning negotiation environment which is constantly co-constructed and redefined by the learners which become the main actors of their potential lifelong knowledge acquisition experience.

How can we translate these elements into the formal educational praxis? If the new social-software based e-learning pedagogy requires an integrated approach in the learning processes, how do we build innovative and effective instructional design models?

This work starts with the analysis of the theoretical implication of learning and knowledge co-construction process and with some preliminary explorative investigations on the advantages of the use of social software in formal eLearning experiences. It then focuses on the presentation of two models: the first illustrates the skills that the online learner in the knowledge society should develop in order to be able to fully experience meaningful learning experiences. These skills are named PKM – Personal Knowledge Management skills. The second model, which is directly related to the first – highlights how social software and, more generally 2.0 technologies –can be represented with respect to the PKM skills they foster.

Eventually, the exemplification of the two models in a concrete educational scenario in which the authors act as teachers and tutors, aims at representing how a formal online learning experience can benefit from the opportunities of a shared and collaborative developed learning.

2 LIFELONG KNOWLEDGE CONSTRUCTION IN THE KNOWLEDGE SOCIETY

In informal learning practices the social behaviour and the support of technologies converge toward the “network”; a network made by people and resources, a social network, unified by personal needs or common goals, interaction policies, protocol and rules and telematic systems all together favouring the growth of a sense of belonging to the “net” community.

At the same time, the lifelong-learning culture is gaining importance as one of the most effective answers to face the challenges of the Information and Knowledge Society. If this Society requires individuals to continuously update their knowledge – or e-knowledge (Sorrentino, 2006) - this cannot happen as a progressive “knowledge accumulation” process. Instead, it can occur through the preservation of our connections (Siemens, 2006) and through the catalyzing and filtering effect of being exposed to those connections: the true competence for a lifelong learner of the Knowledge Society is the capability to “stay connected” and “belong” to digital communities where interests are and can be continuously shared. In 2004, the scholar G. Siemens launched the theory of Connectivism based on a critique of previous main learning theories synthetically labeled as behaviorism, cognitivism and constructivism (Siemens, 2004).

According to Siemens, even the latter theory, which appeared to be the possible theoretical framework for e-learning practices (more specifically in its variant named “social constructivism”) – could not provide an adequate theoretical support to the instances brought by the new learning contexts. According to this author

"The pipe is more important than the content within the pipe", meaning that it is the network itself which is the basis of the learning processes. If the knowledge society requires the individual to continuously updates his knowledge, this cannot happen as a process of progressive "knowledge accumulation", instead this can occur through the preservation of our connections. If from one side we value connectivism as a context in which learning can more favourably occur, thanks to available technological solutions (Fallows, 2006), on the other side we acknowledge that connectivism is also enabled and allowed by an always stronger user participation to the creation, sharing, use and management of resources (contents, relations, applications, etc.) through social software. Users have certainly became always more aware consumers and producers of resources, they have became "prosumers"(producers + consumers).

Knowledge is the result of a fluid combination of experiences values, contextual information and specialist competences, all together providing a reference framework for the evaluation and assimilation of new experience and knowledge (Pettenati, 2006b). (Norris, 2003) highlights the recursive, dynamic and networked character of learning in digital contexts: "Knowledge can be understood as interpreted content, available to a member of a community and always shaped by a particular context. Digital representations of content and context become e-knowledge through the dynamics of human engagement with them. The digital elements of e-knowledge can be codified, combined, repurposed, and exchanged".

Analogously, we attribute to e-learning a social connotation, for us, e-learning is a type of learning which is somewhat supported by technologies, but it is not necessarily conducted at a distance; it allows interaction between people and contents, and among people but (most important) is a type of learning valuing the social dimension of the underlying knowledge processes (based on (Calvani, 2005) definition, freely translated and adapted by the authors). e-lifelong-learning methods and tools can provide each knowledge society citizen with the possibility to carry on individual and personalised lifelong learning experiences which will come across formal, non formal and informal learning stages with various degree of uses of technology. In this domain theoretical reflection and applied research is still at the beginning.

3 PERSONAL KNOWLEDGE MANAGEMENT SKILLS IN THE DIGITAL LANDSCAPE

What is (Personal Knowledge Management) PKM? Its origin is in the university environment, in the years after 1999, in two U.S. institutions, first at UCLA, Los Angeles, CA. and then at Millikin University in Decatur, IL. (Frand & Hixon, 1999), (Millikin, 2003). Initially, and for some time, PKM has been an isolated concern of universities, but subsequently it has been re-interpreted as valuable in any environment, including the enterprise. According to Professor Paul A. Dorsey at Millikin, a leader in the field:

> *Personal knowledge management is best viewed as based on a set of problem solving skills that have both a logical or conceptual as well as physical or hands-on component. (Avery et al., 2000).*

PKM is a concept with depth and complexity, but its roots are clear and simple: if knowledge is power, a precious asset to attain leadership and self-realization, why should it not be at the center of an individual's personal aspirations and efforts? Why should it not be the object of specific skill development?

In view of establishing the relation between PKM skills and learning design, we group PKM skills under three macro-competence categories, CREATE, ORGANIZE and SHARE, as shown in the following table:

CREATE	ORGANIZE	SHARE
Editing: exploit technological features for digital information creation in multimedia formats. *Integrating:* post-processing of recordings, digital annotations, automatic abstracting, etc. *Correlating:* make connections, draw diagrams, mind maps *Manage security issues*: manage privacy, intellectual property rights, and digital management rights.	*Retrieving*: searching, reading, asking, listening, managing information abundance, managing cognitive overload. *Searching/finding* *Storing*: deciding archiving media, considering resource availability and accessibility. *Categorizing/classifying*: defining relations among pieces, using folksonomie. *Evaluating*: extracting meaning, attribute relevance, affecting trust levels.	*Publishing*; presenting relevant information, using appropriate publication channels (web sites, digital archives, blogs, …). *Mastering knowledge exchanges*: being concise, taking turns, focusing on topic, etc. *Managing contacts*: keeping profiles, keeping contact contexts (social network representation). *Relating with others*: establishing connections, effectively communicating through new media; understanding peers, using different languages. *Collaborating*: sharing tasks, working to a common goal.

Table 1: PKM skills and skill acquisition in the Knowledge Society

4 2.0 TECHNOLOGIES

In this scenario, many of the innovative technologies of the so-called "social software" are now playing crucial role as a support to learning and knowledge processes. This does not mean that the scaffold provided up to know by formalised online educational environment is to be entirely rebuilt, but the current "extended cognitive context" (environmental, situational, cultural characteristics) in which the learning dynamics occur must reshape the learning environment itself (Bonaiunti, 2006).

Innovation in technology has brought about new (or revisited) processes and practices, expressed through new (or revisited) criteria and terms. Recently, the educational e-learning universe with all its possible variants, i.e. formal, informal, non formal (Conner, 2004), lifelong (Cross, 2006), coupled with connectivism features, etc. have been named ("tagged") e-learning 2.0 or learning 2.0 (Downes, 2005), analogously to what happened for the web 2.0 phenomena (O'Reilly, 2004).

Technologies and tools now referred to as web 2.0 software (Hinchcliffe, 2006) (O'Reilly, 2004) (Fallows, 2006)1 certainly provide both the origin of this reasoning as well as the goal to which aim to. Sharing Paul McFedries (McFedries, 2006) tentative definition according to which Web 2.0 is "a second phase of the evolution of the World Wide Web in which developers create Web sites that act like desktop programs and encourage collaboration and communication between users", we focus on the characteristics of the Web 2.0 applications, highlighting the social perspective of relation, collaboration and user-participated architecture (McFedries, 2006).

Folksonomies, co-browsering, tagging and social networking are "2.0" practices. The *fil rouge* they share is that they all are expressions of a shared, diffused cognitive strategy for information retrieval in a spontaneous way, as support to social sharing tools (such as social bookmarking tools, image sharing tools, blog search engines, etc.). Through social tagging the member of the community defines a link among resources (sites, images, videos, audios, etc.) and the terms used to describe them (Bonaiuti, 2006).

This is a bottom up process, starting from a single user adding a link to a web site and tagging it at his complete discretion, using keywords which are meaningful to himself. Social sharing tools can display this tags through using a visual approach (which increases the font size of most popular tags), thus realising tag clouds which immediately provide users with a perception of the popularity of the tags.

[1] Although we use in this work the current web 2.0 jargon, we share Fallows parenthesis (The single most annoying aspect of the annoyingly named Web 2.0 movement is the use of the term "mashing up" to denote what in English we call "combining.") (Fallows, 2006).

This "folksonomic" classification method, which relies on the spontaneous users' contributions (be him an author or a sporadic resource user) leads to results capable of reflecting the information according to the conceptual model of the population that creates it (Bonaiuti, 2006). Representing information in classificatory structure is information in itself: classification incorporates information and provides the interpretation context which (in its globality) appears transparent, objective and neutral (Surowiecki, 2005).

5 MODEL FOR LEARNING DESIGN AND PKM SKILLS ACQUISITION

The representation of web 2.0 technologies in figure 2 resumes the methodological framework of two different sources that we share and integrate in a social dimension-oriented perspective.

The first one is by Heddergott: it gathers web2.0-tagged technologies on a Cartesian axis and relates user participation and therefore technologies socializing degree with the different areas of application2 (Heddergott et al., 2006). The independent variable in that scheme is bound to the design of the different educational scenarios.

In place of areas, we substitute on the abscissa, part of the methodological proposal of the second model, the one used in the course of three training workshops promoted by METID3 of Milan Polytechnic which groups "2.0" technologies in a 3-axis modelling (Sancassani et al., 2006). According to this view, we represented the web 2.0 technologies with respect to knowledge society skills: create, organize and share (see also prev. paragraph). For an in-depth analysis of technologies and their educational adaptations, refer to Fini (2006), Bonaiuti (2006) and Pettenati (2006a).

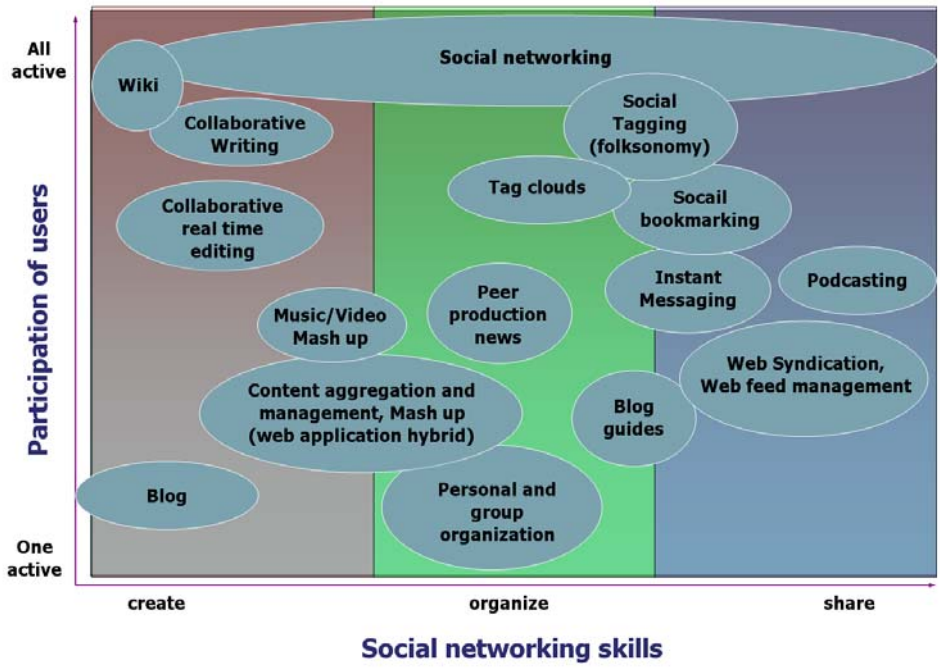

Fig. 1. Social networking technologies and PKM skills (adapted from (Heddergott, 2006))

[2] Announcement of information; collection and systematisation of information; learning and education; social exchange; entertainment.

3 Metid Center, Politecnico di Milano (IT) http://www.metid.polimi.it/ "Classroom web 2.0" Work Shop Net content construction, 13 December, 2006 and "Media sharing" Work Shop Net Sharing13 march 2007.

6 EXAMPLE OF A SOCIAL SOFTWARE-BASED SCENARIO

What has been presented up to now requires a practical realization to pave the way of the demonstration of the effectiveness of the approaches. The authors of this work are engaged in many activities designed to this extent4.

For the purpose of this wok, we will hereafter present a macro-instructional design which is both the expression of the networked learning concept as well as the boost for the development of the PKM skills supporting life long e-learning. The scenario is taken in the context of the post-graduate online learning Master degree program for e-learning designer and manager held at the University of Florence, in Italy5.

In this context the authors, acting as teachers and tutors in different modules of the curricula, have worked to harmonize their didactic activities (Ranieri, 2005) in order support both the development and the use of PKM skills in the knowledge construction through social software-based learning environments (Pettenati, Cigognini, 2007).

Indeed, interdisciplinarity and know-how interconnection have always been a design criteria in the definition of e-tivities (Salmon, 2002) for the Master curricula; according to this philosophy the same scenario envisaged in a specific module e-tivity was to be analysed from the perspective of the learning designer and the e-tutor, than enriched by the info-broker profile, shaped by the content manager and implemented by the learning environment technician and eventually evaluated in its applicative feasibility by the change manager.

The authors' intent is now to reflect this spontaneous, collaborative instructional design praxis into a methodological approach sustained by social software technologies.

How should be set up an educational online experience in order to sustain the PKM skills – needed in the digital landscape – through the use of social software? In the following scenario provides a possible answer. We use two messages written by two modules tutor's to highlight the learning design interconnection and the social nature of the design setting.

The two modules accounted for are the info-broker and the content manager modules. The reasoning can be extended also to the other's curricula modules.

The "info-broker" e-tivity module is based on the scenario of the art course developed in the learning designer module. The tutor's message reads as follows:

> *"Starting from the wiki of the macro-instructional design module, you are asked to tag all fundamental concepts and start building a collaborative glossary using the tools you prefer among those presented during the class meeting (e.g. del.icio.us, connotea, diigo, etc.); then keep on creating your image gallery (on Flickr) and setting up the virtual tour, after having looked for related resources (virtual museum tours for instance on YouTube, etc.). I suggest that you use the module forum and a VoIP tool (e.g. Skype) for coordinating the collaborative activities (don't forget to elect a moderator for the synchronous sessions and to remind him/her to update the log of your sessions on the wiki page). As for the collaborative editing of the event's content (two brochures and a poster were required) you can use the course's wiki. For the final group reflection I ask you to install and use the mind maps sharing tool (Cmap) and export the co-created map into an image format. I'll be hanging around until you'll have your first meetings in Skype done. Then'll you'll read from me again. ☺!"*

4 See (Bonaiuti,2006);E-learning 2.0 website: http://www.e-learning2.it/wordpress 2.0, LTEver social network community for e-learning designers: http://www.lte-unifi.net/elgg/; (2.0 Workshop, 2007).

5 www.netform.unifi.it; the master program is currently running its sixth edition. The design of the curricula envisages the courses and modules set up around six main professional profiles: e-tutor, instructional designer, info-broker, content manager, change manager, learning environments technician.

After the completion of the info-broker module, the content manager module starts. The tutor's message reads as follows:

> *"Hi! This module's e-tivities are related to the design and creation of educational content for the Web; your creativity is required here! ☺ but don't worry, you'll be eased by the work you've already done in the previous info-broker module where you've set up very good basis. So, you have the same scenario and the same focus on the creation art virtual tour: from the collaborative wiki's content, the blog, the image gallery, the glossary and the videos you've collected, you are now asked to make the storyboard and realise the multimedia product. Use Del.icio.us with a shared tag to collect the different contents (each group negotiates and chooses its tag). Wiki's content is to be reformulated into learning pills following the sequence of the tour in two or three vertical paths (one for specific artwork). To this extent I ask to the new coordinator to make a round-table in the proper forum's thread to post the wiki choices in the wiki-log. Please, use Cmap to build the virtual tour path which will lead the user through the art-related matierla. As always, a first check point is settled after Skype's initial sessions. This module will be the last before your Easter's holydays; so….make another effort before enjoying the deserved having your very nice holydays !!"*

7 CONCLUSION

In this paper we tried to provide our interpretation of the current socio-technical educational system shaped by technologies and practices of the "Knowledge Society" to locate the role of learning and learners in a lifelong perspective.

We believe that both users attitudes and available technologies are mature to let us envisage that each network user could easily engage in a lifelong learning personal experience if properly lead by appropriate methodologies and sustained by accordingly designed and developed personal learning environments.

Our belief is that the knowledge society requires everybody to acquire of a set of PKM to become aware users of the network affordances (as citizens, as workers, as lifelong learners, as tourists, etc). Up to now, traditional educational has considered to various extents the problem of availing of telematic technologies to provide enhanced learning. Nonetheless, the issues of preparing students to properly master these technologies to derive the maximum advantages, has not yet entered in the formal educational activities.

Social networking tools and methods provide a tremendous opportunity and context to seamlessly fill this gap driving the subject into a learning and knowledge landscape in which PKM skills and competences are the enabling condition.

Independently from the fluctuating state of the concept of learning and of the technology roadmap, we believe that the approach we adopted is on the track to lead us to a true actualization of a lifelong learning practice for all knowledge society members.

The educational scenario set up represents an example of the ways in which formal and informal learning may lead to holistic and complete development of the PKM skills of a networked subject. In the following scenario, many of the innovative technologies of the so-called "social software" are now playing crucial role as a support to learning and knowledge processes.

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