Supporting cross-institutional knowledge-building with Web 2.0 enhanced digital portfolios

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Abstract

This paper discusses how to facilitate cross-institutional knowledge building in the context of university-workplace partnerships. The elements of new type of university-workplace relationship, and the role of technological support are described and illustrated with a case study on Web 2.0 enhanced digital portfolio implementation in Tallinn University.

1. Introduction

This paper focuses on methods for providing technology support to cross-institutional knowledge building that is becoming one of the crucial factors in the dynamic post-industrial society. Organizing information within institutions no longer needs to take place around structural forms of organization only, which are defined by vertical (upward-downward) hierarchies and the hierarchical collection, storage and distribution of information. Instead, the process-oriented integration of information technology can make activities, events, and objects visible.

2. The nature of new type of university-company relationships

Fürstenau [3] refers to the boundary-crossing transitions that take place within and between workplaces and universities. Individuals interact with each other in organizations to transcend their own boundaries and, as a result, change themselves, others, the organization, and the environment [4]. Crossing boundaries involves encountering difference, entering onto territory in which we are unfamiliar. Boundary-crossing practices take place in the form of brokering in which people use their common membership in various activity systems (networks, projects, learning or problem solving situations) to coordinate perspectives, to transfer ideas or to introduce elements of one practice into another [9]. In these boundary-crossing transitions the boundary objects are used, which are objects that are both plastic enough to adapt the local needs and constraints of several parties employing them, yet robust enough to maintain a common identity across sites. Boundary objects accommodate the kinds of knowledge being co-developed among the groups [1].

The potential for boundary-crossing depends on several factors, such as how the boundary objects and boundary practices are communicated, discussed, critically reflected by all involved parts [2], how they are distributed and stored. The theory of knowledge creation in industries [4; 5; 6], provides background knowledge how to effectively support cross-boundary activities via technology. It views organizations as dynamic knowledge-creating entities that interact with and reshape the environment and itself by creating and in-taking knowledge assets and the whole external environment as an ecosystem of knowledge through knowledge creation processes across borders [4]. Knowledge assets are not knowledge just created but they also include social capital that is shared, and the organization-specific patterns or ways of doing things in dialogues and practices. Adopting this view to the cross-institutional knowledge-building situations between universities and workplaces enables to consider educational organizations and workplaces as dual pairs of one system (organization-environment) in which another organization acts as the environment from where knowledge is taken in and synthesized across the borders. The knowledge assets in this system are boundary objects and boundary processes. A knowledge-creating organization needs to manage a multilayered context-creation, which stretches across organizational boundaries, and simultaneously protecting certain organizational knowledge assets as sources of competitive advantage [4; 6]. New view of knowledge management within organizations have to provide access to the knowledge assets that involve the contexts of group knowledge (opposite to the previously focused individual knowledge), and make the social networks viewable to enhance finding the knowledge co-workers [8]. Supporting cross-institutional collaboration, and capturing the
collaborative knowledge-creation processes as new learning objects, are aspects to be developed as part of the technological support. Knowledge assets must be evaluated and changed through reuse in different situations. However, it must be solved how to deal with the clones of the same knowledge asset in different contextualizations, which would be accumulating to the repositories.

3. Synchronization of cross-institutional and personal objectives

The individuals need to constantly harmonize their personal objectives with those of the institutions and monitor themselves in order to stay on track, and be intrinsically motivated [7]. In organisational knowledge-creation, personal subjective tacit knowledge, has to be externalized into objective explicit knowledge to be shared and synthesized within and beyond organisations, and newly created knowledge must, in turn, be embodied by individuals to enrich their subjective tacit knowledge [5]. Important phases of supporting the cross-institutional knowledge-building process are the following:

1) Socialization of tacit knowledge happens when individuals are prompted accumulating knowledge in an apprenticeship manner, using the stance of institutional norms and objectives. Organizational objectives and norms must be accessible from systems as normative learning objects, learning activities and assignments at university should advertise certain values that are in line with the work partners. This assumes mutual accessibility to these learning objects and certain synchronization mechanisms.

2) Externalization of tacit knowledge into explicit, when individuals are prompted to use metaphors, models, diagrams or prototypes to articulate tacit concepts. This individual process can be technologically mediated if the norms are available and harmonized to certain extent between industry and university as normative learning objects, and if the individuals are sharing a common vocabulary that aids externalization processes. Currently IMS LD (http://www.imsglobal.org/learningdesign/) provides a generic and flexible language to capture the specifics of the unit of learning, and enables to express various pedagogies in the form of UML activity diagrams. Another interesting initiative is UAM (http://domino.research.ibm.com/comm/research_projects.nsf/pages/uam.index.html), the business activity management framework, which offers re-usable activity patterns describing the properties of the learning activity and its relations to associated people, artifacts, tools and events. However these frameworks are not suitable for intuitive construction of knowledge-rich activity patterns of tacit experiences. Storing and modifying individual knowledge assets as learning objects in public repositories must be provided, but the individuals need to maintain control over their versions of knowledge objects. The latter can be done if using portfolio type of software.

3) Combination activities of explicit knowledge can be supported with cross-border group discussions, where individuals with different perspectives can negotiate upon the externalized concepts. Since they have ownership of their knowledge objects situated at company or university repository, their can reuse them in certain border-practices using personal portfolios adjusted both for work-place and university systems. Technically it may be solved using social information filtering and retrieval mechanisms. However, companies with business interests may want to keep part of this intellectual knowledge behind the institutional walls. Collaborative systems that provide facilities for cross-border discussions for knowledge creation, and support storing of knowledge assets in the group context, are needed.

4) Internalization, the personal learning from activities the individuals have participated, must be supported by self-reflection systems using portfolios. These systems could be supporting personal contracting of learning objectives that can be monitored institutionally.

4. DiPo – a new digital portfolio system for cross-institutional knowledge building

Integrating academic (mostly explicit) knowledge of university staff and practical (mostly tacit) knowledge of teachers at workplaces has always been one of the main challenges in the field of teacher education, up to the point that young teachers are sometimes advised by experienced colleagues to forget everything they have learned in the university in order to survive the first year as a teacher at school. Boundary-crossing knowledge building activities between schools as workplaces and teacher training institutions have been with low impact. One of the barriers for fruitful cross-institutional knowledge building is the fact that most universities use closed LMS as the main digital support tools for knowledge building during initial teacher education. As soon as a new teacher has graduated from the university, her user account for LMS is cancelled and access to the wealth of digital information is significantly reduced. At schools the teachers use learning object repositories and must align themselves to the professional qualification standard. In order to increase cross-institutional (school-university) knowledge building activities, Tallinn
University Centre for Educational Technology has built and implemented an open source portfolio platform DiPo (see http://htk.tlu.ee/dipo) that is provided as a free service. DiPo has been integrated with social learning object repository LeMill (see http://lemill.net), social bookmarking tool Del.icio.us, photo sharing tool Flickr, and some other social software tools. The DiPo software is built as an add-on module for Plone CMS (see http://plone.org). DiPo integrates personal ePortfolios and the community portal at organizational level. Personal ePortfolios are used for storing individual data, evidences of person’s competences, and EuroPass-styled Curriculum Vitae in line with the professional teacher qualification standard, which represents the normatives of the workplace. The teachers who own DiPo portfolios at workplaces are expected to reflect regularly on personal learning experiences they get at work environment using blog-based Diary tool, and get feedback from the mentors at the university or associates at workplaces. Thus, university standards can be interwoven with professional practice. Drawer enables to manage the knowledge objects teachers have created in LeMill, Flickr and del.icio.us. All knowledge-objects in DiPo are tagged and can be linked to certain competency in the professional qualification standard. The institution- and community-based functionalities of DiPo are different retrieval and aggregation tools for knowledge-objects, persons and networks. Within DiPo system, teachers can form virtual communities that are based on institutional hierarchies (e.g. teachers from one school), job profile (e.g. teachers of mathematics), geographical location etc. Each group in DiPo system has a group area for collaboration that includes a notice board, forum, task list and shared information page with aggregated content (RSS news-feeds, Del.icio.us bookmarks, Flickr photos, YouTube videos). DiPo has been effectively tested nationwide in Estonia with 1000 users as a support system for cross-institutional learning in the context of all three levels of teacher education: in the preservice school practice, induction year, and continuous professional development of in-service teachers. In the next step DiPo is used in industry-university settings.

5. Conclusions
Using Web 2.0 enhanced e-portfolios (tagging, aggregated feeds) the network-type of communities within and between organisations, that use resources from various repositories in cross-border activities, can start function in parallel with hierarchical information management and knowledge building structures.

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7. References


