TOWARDS ONLINE SOCIAL LEARNING

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Abstract

Nowadays we may observe gradual transition from classical web to a state reffered to as Web 2.0. Users become more active participants and more integral parts of the whole, while the distinction between consumers and producers wanes. The change is mainly social, rather than technological, so we face not only technical challenges and questions, but also challenges social. Learning and education do not stand apart, more to the contrary these processes are being influenced in a great scale. In the article I discuss the current face of affairs on the meeting of social computing and education, point out some of the new categories of requirements on educational systems and their actors and introduce several both experimental and real world attempts to cope with them.

Keywords

Web 2.0, social computing, social networking, e-learning, social learning

Abstrakt

V současné době jsme svědky posunu prostředí webu směrem k tomu, co bývá zastřešováno pojmem Web 2.0. Uživatelé se stále více stávají integritní součástí celku, a to svou aktivní účastí, když vedle jeho přijímání obsah velkou měrou sami vytvářejí. Jde o změnu zejména sociální, a tak i otázky a výzvy, které přináší nejsou jenom technologické. Procesy výuky a učení samozřejmě nezůstávají stranou, naopak. Článek se snaží mapovat oblast setkávání sociálního software a vůbec celého fenoménu sociálního webu na jedné straně a oblast vzdělávání na straně druhé. Zmiňuje nové kategorie problémů a požadavků na systémy i účastníky procesu výuky ve změněném prostředí a představuje některé jak experimentální, tak v praxi nasazené projekty, které se snaží na výzvy odpovídat.

Klíčová slova

Web 2.0, social computing, sociální sítě, e-learning, sociální učení

1 Social computing

Nowadays it is more and more apparent, that web becomes semantically richer and driven by the community. Mika [15] points out, that the field of knowledge representation and reasoning has existed long before, but what is new is its application to a large-scale, open, distributed web environment. Web 2.0 is not so much about a new technology but rather about the perception of web sites as user-oriented social

spaces to collective action and creativity, thus establishing online social networks. Although early web applications lacked the elegance and interactivity of desktop applications, the gap is closing now with the current graphic design principles, interactive multimedia capabilities such as Flash embedded, approaches such as AJAX, well-designed caching mechanisms and other ways to increase the responsiveness of the user interface [19].

What is the sense of current social networks? Many community portals or applications for social networks are toys for their users. But there are other even a professional areas, where a social software can prove as a highly useful and powerful means for cooperation and collaboration. It may be used to infer informal relations in a user group in order to reveal communities of practice (such as Ontocopi or Charles River's Connect projects), to support software engineers remotely working on either shared or distinct software projects [20], to build up a map of scientists related through the common object of research (such as BioMedExperts) and of course, to touch, enrich maybe even redefine the processes of education and learning.

2 Ongoing changes in learning and education

Our newest generation do not view digital technologies as something apart, technology is a fully integrated aspect of their lives. Not surprisingly, this change has serious implications in the space of education. Technology can have a reciprocal relationship with teaching. The emergence of new technologies pushes educators to understanding and leveraging these technologies for classroom use and vice versa. [9]

Life-long learning [1] refers to a society with enough learning opportunities for those who want to learn. Process of learning is no more restricted to formal learning inside classrooms backed by educational institutions. It becomes an activity throughout the whole life - at work, with friends, at home. Web 2.0 concepts and technologies bring new options of effective life-long learning. Socially based tools and systems, referred to as social software, support activities in digital social networks. New self-directed, self-managed and self-maintained communities, typically open to all learners, have grown rapidly already. Yes, there will be many expert applications working with stable knowledge with a high degree of formalization, operating within domains such as medicine, science or engineering thus fully operated institutionally and still there will be also enough space for institutional providers of both educational services and learning content and for the traditional education itself. But on the other hand, there will be also large, web-scale applications manipulating lighter and much more dynamic structures, such a EAT, emergent ontology based on empirical data [15]. And we may see that the focus inexorably moves towards services and sites maintained by an open community, where life-long learners become knowledge prosumers, both consumers and producers at the same time [8].

Even one of the simplest social networking technologies, the blogging, touched ways we learn already. It opened access to whole pools of experts whose views and ideas are now widely available [8]. Reputation of bloggers is being driven by the value of artifacts published, thus we may consider blogs as a self-organising space of knowledge. Semantic web technologies can serve the Web 2.0 community very well also in opening applications to recombine data from several sources, thus achieving another level of value [15]. Web 2.0 technologies may also help to establish and support

relations between people according to shared interest. The relation may be either explicit, stated by users themselves, or implicit, inferred, learned somehow. As a part of social network analysis, ontology based social network models help explicating relationships between users, that may not be obvious at the first glance [16]. There are interesting initiatives on the field of clustering user profiles according to the common preferences. Cantador et al. proposes multilayered semantic social network model, which would help to find deeper similarities and relations among individuals. There are three steps suggested – semantic preference extension, concept clustering (to identify cohesive interests) and finally the user clustering [2].

Study on the impact of Web 2.0 innovations on education and training in Europe [18] focused on social computing from the broader and greately practical point of view. The study concludes with several areas of benefits of these tools in the pedagogical area. One of the main assets of the tools is the potential to increase collaboration, empowering the individual as a producer and embedding his creative potential in a space of mutual assistance and support. Social software may respond better to the changed cognitive processes and learning patterns that have evolved due to widespread use of technology, promoting the flexible use and combination of different sources and tools and supplying immediate responses. Social computing tools may recognize the diversity of users and contribute to the personalization of educational experiences and may allow to connect, interact and collaborate with a variety of people on different tasks and in diverse environments. Social computing also supports organisational innovation by re-integrating the institution into the community, transcending borders between organizations, countries and cultures and strengthening the social interactions between all participants involved in the learning process, thus transforming E&T institutions into communities.

3 Emerging challenges

Preece points out two major critical success factors for learning social software - usability and sociability. Each of them brings its set of criteria, requirement and ways to fulfill them [17]. Groff and Mouza [3] discuss central factors and their critical variables, that interact with one another to produce barriers to technological innovations in the educational environment: research & policy factors, district/school factors, factors associated with the teacher, factors associated with the technology-enhanced project, factors associated with the students, factors inherent to technology itself. For teachers Groff and Mouza advice to focus on those capable of being influenced by the teacher's own actions.

Motivation to contribute

To get a functional community content intensive system, we have to think how to motivate participants to contribute. Sometimes, the encouragement to contribute knowledge may be more critical and more difficult than technical aspects of knowledge capture, storage and circulation. Social exchange theory shows, that participants will contribute when there is some kind of motive or reward involved. The theory suggests four mechanisms to encourage participation.

- *anticipated reciprocity*: learner has a pre-existing expectation that he will receive useful information in return;

- *personal reputation*: learner feels he can improve his visibility and influence others in the network;
- *social altruism*: learner perceives sharing knowledge as a 'public good', especially when contributions are seen as important;
- *tangible rewards*: learners negotiate to get some kind of asset in return.

Klamma et al. show results of experiments with influence of motivation mechanisms on activity of participants [8].

Competences and reliability of content

While institutionally managed knowledge allows to set comptencies in an administrative manner, if we talk about self-organising spaces, we are in need of other mechanisms to infer comptencies and count reliability of content. Shum [19] points out, that social tools provide mechanisms for building reputation, from the trivial, to highly meaningful indices, such as authority based on the quality of material or feedback that user posts, or professional endorsements.

Many of the aggregated or inferred associations are driven by the collective mindset of the subjects involved. A collective mindset that is likely shaped by the well-known law of community formation - interaction creates similarity, while similarity creates interaction [13]. We should be aware, our knowledge models will never be objectively perfect.

Content processing

Tomorrow's semantic web should understand the meaning and reflect the user's background, it should enable inter-operability between different applications and it should provide a wide platform for intelligent web agents and adaptive web systems to operate on. It should allow more but require less human intervention. Ultimate goal set for semantic web is that it should effectivelly assist humans in their daily activities [16]. It is obvious, that to achieve such goals, the technology should not play only the role of passive board for participants to express themselves, but support their efforts in an intelligent and pro-active manner.

There are more approaches for machine-processing information such as the statistical approaches and the knowledge representation approaches. The major difference between the two concerns handling of incoming or already existing data. The former approach assumes the data with a low level of semantics. Systems that are developed according to this approach, such as those that involve machine learning methods, analyze a given piece of data and try to learn rules out of the regularities in it. The latter on the other hand does make use of data primarily with a strong semantical representation. These systems have an internal representational structure of how the data to be processed ought to look like and the data is being processed according to this representational structure. Therefore, the second approach implies knowing beforehand, whereas the first one implies machine learning [16]. The extraction of structured facts from unstructured data is not easy. In order to avoid the challenge of modeling a common understanding by an individual and also to avoid the difficulties of learning ontologies, there are approaches, which enable a community members to model their knowledge in a semiformal manner [14].

Adaptability and flexibility required

Web 2.0 is characterized by permanent transformation. New members are joining the network, others are leaving, interconnection increases through the new interests, furthemore the nodes gain additional data [14]. It brings challenges and additional requirements on the systems at the back of the learning community. Klamma et al. perceive adaptivity together with personalization as key issues for implementing mechanisms to support and increase activities in social learning networks. [8] Learning materials are typically too general, so personalization can be a great added value that e-learning can offer compared to classical learning. It may adjust to various working conditions and needs of students, either academic or corporate. They have different goals, interests, preferences, motivation levels, learning skills and endurance, acquired competencies and knowledge. Survey [4] has shown that a high majority of respondents consider personalization and adaptation of learning as really crucial factors. And the WINDS experience [10] shows that teachers, even without programming skills, can create web-based adaptive courses and students can benefit from the usage of these courses.

Isolation of both community systems and learning resources

The proliferation of online social websites results in the accumulation of a large volume of real-world data in diversified application domains. Social network systems are generally separated with each other, though there are many online communities, whose interests and ideas overlaps with one another [6]. Overcoming the data isolation, we would open a new area of dynamic composition of services and resources, something really beneficial to the users.

Trust and security

There are challenges, with may seem nearly unbridgeable - issues of trust, privacy and security. Trust is a way for humans to cope with the uncertainty they face in their social interactions. We rely on people we trust to give us advices and information about new people. We are able to process the input and make conclusions. In social networks on the web, the chance of encountering someone we do not know is higher than in elsewhere. When explicit human-to-human trust ratings are specified on social networks, can these be automatically meshed in order to infer a new overall value of trustfullness? For example, Trust Ontology project deals with metrics for inferring trust over web based social networks, and applications of these ratings [7]. Once the trust information from more trusted sources is available, it can by used many ways, e.g. to show the trusted information more highlighted. Maybe, dedicated trust or reputation systems will help in the future [12]. We see, some efforts and initiatives have been undertaken already, but their real impacts are yet to be examined and the current progress is being undermined by lack of accepted standards [11].

4 The methods in experimental implementations

I already mentioned some experimental implementations, such as [10]. Redecker [18] discusses many real word projects. To point out few more, MACE [8] project aims at making several existing learning repositories on interoperable architecture in order to both qualitatively and quantitatively enrich available contents with various types of metadata – domain, usage, competence, contextual, and social. We may also consider

socially oriented systems based on Web 2.0 ideas aimed on niche areas of education and learning, such as Cohere system for community argumentation [19] or tools for better resources sharing and utilization among teachers and students (such as Gardner's Enrich DELTA project) and others.

Taking combination of approaches, it leads us to a whole generation of new collaborative and adaptive learning platforms (CALP) which integrate elements from social software together with proven e-learning approaches. CALP has to support personal knowledge management like interlinkable blogs, collaborative knowledge capturing, joint building, sharing (e.g. wikis), both top-down (system-driven taxonomy) and bottom-up (social tagging , folksonomies) annotation schemes, opinion publication and processing, transparent access and search across content and metadata, intelligent resource delivery, social networking functions (to express and maintain relations) and connect people through content, reputation, support for newcomers to integrate without hassles, distributed architecture [8].

5 Conclusions

The transformation of web into Web 2.0 is under way already and unevitable. No matter how we think about it, we can neither reverse nor slow down the process. But we may take opportunities instead – especially the opportunity to shift learning more close to a common life of today's people. Meanwhile, recent research has shown effectiveness of work with knowledge in a community manner and also the positive effects on motivation and even on measurable results of learning. The same research also brought understanding that there is a need to step forward and move out from the game and toy area and tightly and neatly integrate the results either to applications that are of actual use to the community or to current e-learning applications [5]. We may anticipate convergence – community social software will act more as a effectual tool of learning, while e-learning tools will move closer and closer to a community. Obstacles on the path will be not only in the technology itself, but also in minds of human actors involved.

As power of our tools increases, we have to be more careful. For example, the research on trust may lead to dedicated trust networks or trust services. Socially enriched learning systems as well as other facets of socially enriched web will be able to take down a lot of our personalities. Step further, watched-out integrated social super-network will cover up most of our relations. Having this in mind, Mika [15] points out, that there is a latent danger hidden in the answers. Can we ensure, that markets, technology and/or institutional regulation will come into place to protect our personal details, our knowledge and our trust profiles from ending up at places where we don't want them?

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