Social software: E-learning beyond learning management systems

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Introduction

Whether focusing on distance education or campus based education, universities all over the world are using learning management systems (LMS) to support and improve learning within their institution. Yet the OECD (2005) report "E-learning in Tertiary Education: Where do we stand?" indicates that universities primarily use LMS for administrative purposes, and that LMS so far have had a limited impact on pedagogy:

"ICT has penetrated tertiary education, but has had more impact on administrative services (e.g. admissions, registration, fee payment, purchasing) than on the pedagogic fundamentals of the classroom." (OECD, 2005, p. 15)

This article will discuss the use of centralized and integrated LMS and argue that they, within a framework of a social constructivist pedagogy, should play only a minor role within organization of e-learning. It is argued that social software tools can support a social constructivist approach to e-learning by providing students with personal tools and engaging them in social networks. Using social software in this way requires that organization of e-learning moves beyond centralized and integrated LMS and towards a variety of separate tools which are used and managed by the students in relation to their self-governed work.

It is argued that social software tools enable a different way of using the web within an educational context. The article discusses how social software can be used to support a social constructivist approach to e-learning, or more specifically, how social software can support self-governed, problem-based and collaborative activities.

Integrating or separating tools?

Tools used to support e-learning cover a wide range of different applications. They include discussion forums, chat, file sharing, video conferences, shared whiteboards, e-portfolios, weblogs and wikis. Such tools can be used to support different activities involved in the learning process. The question of organizing e-learning tools involves the problem of *integration vs. separation*. On the one hand, it is possible to integrate different tools in a single stand-alone system, a learning management system, also called virtual learning environments or e-learning systems (such systems include Blackboard, WebCT, Moodle). On the other hand, tools can be separated in a number of distributed and independent applications used for different purposes.

One approach to e-learning is the use of LMS. All LMS are not alike, and they can be used in different ways. However, a common idea behind LMS is that e-learning is organized and managed within an integrated system. Different tools are integrated in a single system which offers all necessary tools to run and manage an e-learning course. All learning activities and materials in a course are organized and managed by and within the system. LMS typically offer discussion

forums, file sharing, management of assignments, lesson plans, syllabus, chat, etc.

Recently, the emergence of social software has questioned the use of integrated LMS. Today, only few social software tools are employed within existing LMS. The question is: Is the next step to integrate social software tools in LMS? Social software has initiated discussions about the extent to which tools should be separated or integrated in systems (see Levine 2004; Blackall 2005; Cormier 2005; Wilson 2005; Siemens 2005; Anderson 2006a; 2006b). However, the discussion will find no answer, unless it is placed within a context of pedagogy. Use and organization of tools within e-learning can be approached in different ways depending on the chosen pedagogy (Dalsgaard, 2005). Different pedagogies will have different things to say about the problem of integration vs. separation. A discussion of the educational value of different tools must use a pedagogy as a starting point. The usefulness of different tools in support of learning depends on which learning activities the tools should support.

Social software

The term 'social software' is used in many different contexts, and the different technologies covered by the term are not developed for educational purposes. Terry Anderson (2005a) has introduced the concept of 'educational social software' which he defines, within a context of distance education, as:

> "[...] networked tools that support and encourage individuals to learn together while retaining individual control over their time, space, presence, activity, identity and relationship."
> (Anderson 2005a, p. 4)

As Anderson notes, social software is a very difficult concept to define. The term not only includes a wide range of different technologies, but the social aspect of the technologies often emerges from a combined use of different technologies. The examples of social software technologies which will be discussed in this article include weblogs, wikis, RSS feeds and social bookmarking. It is, however, important to note that social software is in no way limited to these specific technologies.

Basically, a weblog is a log file with dated entries listed on a web page in chronological order. Maintaining a weblog means continuously writing new entries which can be categorized under different headlines. A weblog in itself is not a social or collaborative tool, but is rather individual and also often personal. It is often maintained by a single individual and it does not support discussion. It is, however, possible for readers of a weblog to write comments on the entries. This means that weblogs primarily support independent and individual presentation.

A weblog which is maintained by a single individual can function as that individual's representation on the web. This representation can form the basis of socialization on the web. When a weblog is related to other weblogs, the weblogs become social, and communities or networks are formed. It is possible to subscribe to weblogs using RSS feeds (Downes, 2004b). Using RSS means that you can get notified whenever a new entry has been written on a weblog. Software tools such as Bloglines (http://www.bloglines.com), BlogBridge (http://www.blogbridge.com), and Feedburner (http://www.feedburner.com) support subscription of several weblogs meaning that you do not have to visit every weblog to find out when new entries are written. RSS enables connections between weblogs – or, rather, between people. Subscribing to weblogs, writing comments and having potential subscribers yourself, means that you actively participate in networks on the web. This is enabled by the combination of personal weblogs and RSS feeds. Often, weblogs refer to other weblogs, thus creating communities. A weblog will often contain a 'blogroll' which is a list of links to other, related weblogs. This means that you can see what other weblogs a person finds interesting.

Social bookmarking tools can also support relations between people. The principle behind social bookmarking is to bookmark your web pages on the web, instead of in your browser. Del.icio.us

(http://del.icio.us) and Furl (http://www.furl.net) are examples of different kinds of social bookmarking tools. When you bookmark a web page, you tag the page with different keywords of your own choice. Being social means that bookmarks can be viewed by other people. You can also see who else has bookmarked the same pages as you and what else these people have bookmarked. Further, some social bookmarking tools can provide recommendations for new web pages based on your bookmarks. Using RSS, it is also possible to subscribe to people's bookmarks meaning that you get notified whenever certain people have bookmarked a new page.

Finally, wikis can be catalogued as social software tools. A wiki is a web page which can be edited dynamically directly from the web page itself. In principle, everybody with access to a wiki can make changes to it. It is possible to either edit a current page or create new pages through new hyperlinks. A wiki keeps track of changes meaning that you can view previous versions of each page on a wiki. The most famous implementation of a wiki is wikipedia (http://www.wikipedia.org), an online encyclopaedia which everybody can edit. Wikis support collaborative construction, development and production.

In this article, social software tools, LMS, and the problem of integration vs. separation are discussed from a social constructivist approach. Although social software tools are not created for educational purposes, I will argue that they can be used to support learning. Using social software can help facilitate an approach to e-learning which differs from using learning management systems and which better supports self-governed, problem-based and collaborative activities. However, a certain organization of social software is required.

Personal tools and social networks

Every organization of e-learning depends on the chosen pedagogical approach. A discussion of the educational potentials of social software, and other tools, needs to be approached from the point of view of an understanding and description of specific learning activities (Dalsgaard, 2005). The approach to e-learning presented below discusses educational social software from the point of view of social constructivism. The conception of learning as self-governed, problem-based and collaborative processes is derived from a social constructivist approach (Bang & Dalsgaard, in print). According to a social constructivist approach, learning is considered a social and active process (Vygotsky, 1978; Brown, Collins & Duguid, 1989; Jonassen, 2000). Problem-based activities describe a learning process in which students are directed at solving a problem. It is important to a social constructivist approach that a student tries to solve the problem him- or herself. In other words, students should direct their own problem-solving process.

> "The individual determines how to proceed based on his or her unique needs, perceptions, and experiences, distinguishes known from unknown, identifies resources available to support learning efforts, and formalizes and tests personal beliefs." (Hannafin, Land, & Oliver 1999, p. 119)

Further, learning materials are considered resources or tools which students use to solve problems. Resources are not *learning* materials, until they are used actively by students. As Hill & Hannafin (2001, p .38) state, writing about resource-based learning:

> "Resources are media, people, places or ideas that have the *potential* to support learning. Resources are information assets – data points organized by an individual or individuals to convey a message (Allee, 1997). For learning, resources must be contextualized to determine situational relevance and meaning. Resources also need to be recontextualized to enable the use of information gleaned from various resources. Once contextual meaning has been established, information becomes organized as knowledge (Dewey, 1933), operating in a larger context of meaning encompassing relevant patterns, biases, and interpretations."

(Hill & Hannafin 2001, p. 38)

Students' self-governed and problem-solving activities are considered the focal point of a learning process. This conception of a learning process means that it is not possible to structure or pre-determine the students' activities in a learning process – the activities must develop on the basis of the student's own problem-solving. As a consequence, a learning environment needs, in the words of Land & Hannafin (1996), to be open-ended. An open-ended learning environment provides students with multiple possibilities for activities. A similar approach is outlined by Jonassen (1999) who presents a model for designing 'constructivist learning environments'. Students' activities in constructivist learning environments are initiated by a problem or project. Surrounding the student are different tools and resources which support the student's problem-solving process.

The approach to e-learning presented below uses social software technologies to empower students in their self-governed activities. Students are directed at solving a problem, and the purpose is to provide students with tools which they can use to solve problems on their own and in collaboration with other students. Self-governed, problem-based and collaborative activities call for tools which support construction, presentation, reflection, collaboration, and tools for finding people and other resources of relevance to their problem. Using social software to support self-governed activities necessitates a different organization of e-learning than the sole use of an LMS. Figure 1 illustrates a different approach.

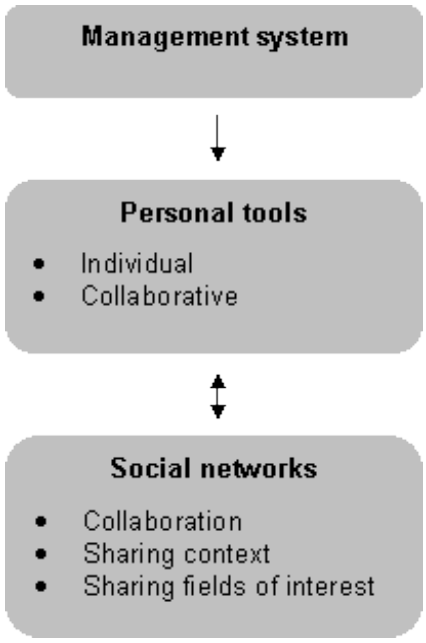

Figure 1. E-learning using social software

The approach is an organization of a number of different tools: a management system, personal tools and social networks.

The approach to e-learning illustrated in figure 1 first of all involves a management system. A management system differs from what is typically meant by a learning management system. The term management system is meant to indicate a limited use of an LMS. Whereas LMS refer to systems which organize and manage e-learning activities within a system, a management system is used only for administrative purposes. LMS are well suited for managing student enrolment, exams, assignments, course descriptions, lesson plans, messages, syllabus, basic course materials, etc. However, self-governed and problem-based activities are not very well supported by LMS. LMS are to a large extent developed for the management and delivery of learning – and not for self-governed activities of students. Learning processes of the kind described in the social constructivist approach outlined in this article cannot be managed. What can be managed, however, is the administrative aspects of a course. Thus, a management system is limited to organizing administrative issues.

Anderson (2005b) describes the potential of social software as "overlay networks":

> "Educational social software can be used effectively to create a type of overlay network to enhance the more formal institutional network consisting of student support, library, tuition, registration and other institutionalized services."
> (Anderson 2005b)

This means that a management system aims primarily at teachers and administrators whereas it does not support the self-governed, problem-based and collaborative work of students.

Personal tools are defined as tools owned and controlled by students. They are used by students for various kinds of construction and reflection; for instance, writing, presenting, drawing or programming. There are at least two kinds of personal tools:

1. individual tools, and
2. collaborative tools.

Individual personal tools are owned and controlled by individual students. Such tools could be weblogs or wikis. The potential of these kinds of personal tools is to support a student's independent work process. For instance, a student involved in a project, working on solving a problem, can use a weblog to communicate and present ideas and thoughts. Further, the student can use wikis or other kinds of web pages to develop the project. An e-portfolio can be used to arrange resources of relevance to the work. Individual personal tools support self-governed and constructive processes.

Collaborative personal tools are owned and controlled by students working together in groups. Collaborative tools could be wikis, discussion forums, file sharing, and, to a certain extent, weblogs. The potential of such tools is to support a closer relationship between students working together on a shared problem. For example, students could use a wiki for collaborative development of a project. Collaborative, personal tools can help create a shared frame of reference within a group.

Social networks are defined as connections or relations between people engaged in different kinds of communication. Communication can be one-way as well as two-way and synchronous as well as asynchronous. Networks also include connections to resources, for instance in the form of references to web pages. Within this approach to e-learning it is relevant to distinguish between at least three different kinds of networks:

1. networks between people working collaboratively,
2. networks between people sharing a context, and
3. networks between people sharing a field of interest.

Networks between people working collaboratively could be students working together in groups. Such networks are primarily supported by personal tools. They are networks of closely related participants, meaning that participants will not only have access to each other's personal pages, but will share personal pages.

Networks between people sharing a context could be students and teachers within the same course. These are also networks of closely related participants, but individuals within these networks are not working together. Students within a course have a shared context and background in the sense that they have read the same texts and are working on similar problems within the same field. This means that students understand each other to a large extent. Thus, it is important to facilitate and strengthen the relations between students within the same course. Social software tools such as weblogs and wikis can help strengthen these relations by making the work of students visible to other students. Students will be able to follow each other's work and will have access to each other's networks of people and references. Social networks also allow teachers to follow and potentially participate in the work of students (Richardson (2005) describes a scenario of a teacher's possible use of weblogs and RSS). Such networks are supported by connections between students' and

teachers' weblogs through RSS feeds combined with social bookmarking.

Seeing each other's work, network and references can provide a basis for discussions between students and teachers. Such discussions are different from discussions in a discussion forum. The difference is that discussions based on weblogs arise from the individual entries of students. Further, a weblog is a personal page whereas a discussion forum is shared; writing individual entries on your personal weblog is different from participating in a discussion. Since students can subscribe to different weblogs, they can create their individual network, which means that their participation in discussions is not limited to specific discussion forums within an LMS. The potential of social software tools such as wikis, weblogs combined with RSS feeds and social bookmarking is to facilitate closer relationships and more frequent interaction between students and teachers. This is facilitated by their sharing of work and references and their engagement in discussions.

Compared to networks of students and teachers within the same course, networks between individual students and other people are networks of more loosely related participants. Parallel to a closely related network of students and teachers, students can create and participate in networks of people from all over the world. For instance, a student can easily create an individual network simply by subscribing to RSS feeds from a number of different weblogs. The student does not necessarily have to participate actively by writing comments. For instance, the student can subscribe to weblogs from researchers, museums, libraries, news corporations, etc. and read about trends and problems within different fields. Further, the student can use bookmarks and references from different researchers. This means that students can potentially get access to research fields and follow ongoing discussions.

In a learning process, a student's problem-solving work constitutes the context. Since the different networks have different relevance to the student's context, they should be organized differently. Collaborative networks should be independently organized by the participants. Networks of people sharing contexts can be formally organized, for instance by an educational institution. Finally, networks of people sharing a field of interest can be facilitated and encouraged, but should ultimately be organized informally by each individual.

The approach to e-learning presented in this article first of all suggests that focus be moved away from learning management systems. Instead of integrating all functions within a system, the approach suggests making available several separate tools to support different needs of students – in other words, providing students with a tool box of different opportunities. At the New Media Consortium Conference (Summer 2004), a similar approach was suggested by Alan Levine, Brian Lamb, and D'Arcy Norman. They coined the phrase "small pieces loosely joined" to suggest an approach of loosely joined applications. On their web page they write:

> "Collaboration via the net does not necessarily require monolithic, expensive tool suites that aim to do everything under one umbrella. We will share and demonstrate the use of readily available, mostly free, discrete sets of "small" and "loosely joined" technologies - weblogs, wikis, instant messaging, audio/video chat. The loose joining means that how they are connected are not necessarily in the programming of the software, but the ways people can use them in a social context that is an environment of dynamic, changing relationships and connections, rather than the rigid, limited ones defined by computer code."
> (http://careo.elearning.ubc.ca/wiki?SmallPiecesLooselyJoined/AboutSmallPieces)

As stated, learning cannot be managed. Learning can, however, be facilitated. The educational potential of social software is to facilitate self-governed, problem-based and collaborative activities by supplying students with loosely joined personal tools for independent construction, and by engaging them in social networks. This approach to e-learning empowers students by giving them the ability to navigate and participate on the web and to use it actively to solve problems. It is important to stress that the argument for using separate tools instead of an integrated system is a

pedagogical argument. The argument is that the learning activities of students cannot be structured or pre-determined. Choice of a variety of tools will better support the required flexibility of open-ended activities than any one integrated system.

Learning management systems vs. personal tools and social networks

Using personal tools and social networks represents a different approach to organization of e-learning than the utilization of an LMS. Using an LMS, an e-learning course is delivered through and takes place within an integrated system. In contrast, empowering students with tools which they can use for different purposes and use independently supports self-governed and problem-based activities. An extreme alternative to the use of an LMS would be to place students in front of a search engine on web. However, it would be extremely difficult for students to navigate the vast amount of resources. Further, every student would have the same entry to the resources on the web.

Use of personal tools combined with social networks form the basis of an individualization or personalization of the web (Downes, 2004b). On the basis of a personal page, a student can use social software to navigate the web to find resources and people that can help solve the problem. Being engaged in social networks, for instance by getting access to teachers' and researchers' weblogs and their bookmarks, also means getting access to a wide range of resources in the form of links to web pages, articles, book references, etc. It means that networks will continuously provide students with references within the field. This represents an alternative to finding resources by searching the web or online digital libraries. Everybody using the same search engine has the same entry to materials. For instance, all students searching for materials within a digital library will use the same search engine, and they will find the same materials, if they type in the same keywords. Using social software, different people no longer have the same entry to the resources of the web. On the contrary, a person will participate in an individual network of people and resources. This is a key feature of social software. By, for instance, connecting to different networks and using social bookmarking, people construct their individual "profiles" on the web. Such a profile can be used to narrow down relevant resources. Unlike using a search engine, you not only search for materials, you also find or "stumble upon" materials within your network. Further, in opposition to the use of systems, social software tools enable active use of and participation on the web.

The approach to e-learning presented above does not suggest simply letting students loose on the web. However, the approach neither suggests confining the activities of students to a system. Instead, it is important to support students' independent work and actively facilitate relations between collaborating students and also between students and teachers connected to the same course.

Towards a student-centred approach to e-learning

The approach to e-learning illustrated in figure 1 utilizes different tools in a certain way. As opposed to the use of an integrated LMS, it is an approach which separates tools instead of integrating them in a system. It would be possible to integrate different kinds of social software tools in an LMS. However, the strengths of social software in relation to self-governed activities concern students' active use of and participation on the web. Further, self-governed activities are supported by providing students with a variety of tools for independent use. Students can use different tools depending on what tools serve their individual purposes. A student-centred approach to e-learning is approached by:

1. using a management system for administrative issues,
2. offering students personal tools for construction, presentation, reflection, collaboration, etc.,
3. facilitating networks between students within the same course, and

4. facilitating networks between students and other people working within the field.

Following this approach, an e-learning course is initiated by the formulation of problems for the students' self-governed work. These may include small problems which may be solved within a week, or they may be problems which form the basis of students' work throughout an entire course. The point is that during the run of a course, students work on problems. The learning processes do not take place within the management system, but develop through the self-governed work of students which is manifested in personal tools such as weblogs or wikis. Separate from the system, the student has different personal tools for construction, presentation, collaboration, etc. In relation to self-governed, problem-based and collaborative activities, the most important tools to the learning process are personal tools. They directly support the active process involved in working on problems and continuously constructing a solution. A personal tool is a manifestation of the work of students. In other words it can be seen as a manifestation of the learning process. This means that students' participation in networks is motivated by the process directed at solving a problem. Networks are secondary to personal tools.

However, the problem-solving process may also be supported by social networks which can provide input to the learning process. Although the students do not necessarily work on the same problems, they do share a common context and subject area. This means that their problem based work and their personal references are probably relevant to each other. The broader networks can also be useful in the sense of widening the field to the students and providing them with new perspectives and references. During their work, students will come across problems, they will have questions, and they will need resources. This is supported by students engaging in social networks. A student's network of weblogs provides him or her with access to other students and their work and resources. Through social networks students are able to find people and other resources which may help them solve the problem. Networks should, to a large extent, be developed by students, meaning that students should form their own relationships based on their specific needs and interests. However, networks may be facilitated by providing tools such as weblogs. Further, networks within a course can be strengthened by connecting students via RSS feeds and social bookmarking.

Conclusion

The outlined approach to e-learning necessitates a focus on students, providing them with tools to support their self-governed, problem-based and collaborative activities. Using a management system, personal tools and social networks differs from the sole use of an integrated LMS. The approach differs in terms of focusing on empowerment of students as opposed to management of learning. An approach focusing on empowerment of students implies thinking in terms of tools rather than in terms of systems. The idea is first and foremost to provide students with a variety of tools for their self-governed and problem-based activities; to empower students, offering them tools for independent work, reflection, construction and collaboration. Second, the approach suggests facilitating students' engagement in different networks. Existing social software tools such as weblogs, wikis and social bookmarking can be used to support e-learning activities. However, these tools are not developed for educational purposes, which means that a directed effort is necessary to develop educational social software tools to support learning activities.

The perspectives for the use of social software in the form of personal tools and social networks to organize e-learning go beyond a single course and the educational institution in which the students are enrolled.

> "The use of computers to assist learning also enables the formation of social contacts that would otherwise be impossible in learning. Students from widely dispersed groups are able to form online groups."
> (Downes 2004a)

The article has argued that personal tools and social networks support self-governed, problem-based and collaborative learning processes. This way of using social software also equips students with valuable tools for using the web as a resource in order to develop their understanding and solve problems – whether in school, at work or in their private lives. This has particular relevance in relation to lifelong learning (Friesen & Anderson 2004). This scenario for lifelong learning is similar to what Koper (2004a; 2004b; 2005) describes as 'learning networks. Although Koper's concept is more organized, it too describes the creation of learner-centred and learner-controlled networks for lifelong learning:

> "Self-organised learning networks provide a base for the establishment of a form of education that goes beyond course and curriculum centric models, and envisions a learner-centred and learner controlled model of lifelong learning."
> (Koper 2004b, p. 1)

Working as proposed here, students not only learn a specific topic, but they are equipped with tools to navigate and make active use of the web to solve future problems. After the end of a course or an education, the networks continue to exist. Continued participation in social networks and creation of new networks give people access to a vast number of people and other resources.

References