Using social software in learning

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Background

Software for Learning Becoming Social

When did software become social? We could argue that significant software was always social in that it was the result of a collaborative effort by software developers (Brooks, 1995), working together or building on someone's previous work. This is software being social at the production rather than the use stage, traditionally thought of as an individual activity. Thinking about students learning with computers may conjure up an image like Figure 1, where each student may appear to be working individually at their computer. At face value, this use of software does not seem to be very social but the reality could be different, with students engaging in online chats, sending emails, posting in discussion forums with friends and acquaintances, near and far. Even where only one person is using the computer, everyone around can be joining in and having fun, as in Figure 2.

Figure 1: Students working in computer lab

Figure 2: Children congregating around a child using a computer

Software on a single computer being used in a classroom can be seen as an activity in a social setting. The student using the computer may talk to the teacher and other students, asking for help, sharing information and reactions to their experiences of the software in use. A study of young children's use of a program for drawing and writing revealed their learning of the construction of meaningful symbols "through independent active thinking processes", and by social interaction. They were developing multiple literacies, not only reading printed texts and writing on paper but also engaging in multimedia, computer-based composition (Labbo, 1996)[2]. This effect has also been observed with students using a shared system. An experiment with Group Decision Support Systems revealed university students' appreciation of and benefit from the information structuring and sharing features of the system (Alavi, 1994).

A more recent exploratory video study into young people's use of games consoles reveals that individual use takes places in a rich social context.

"*Games intended to engage a single player were shown to incorporate cooperation with, and the contribution of, others.*" (Schott & Kambouri, 2006).

This study found examples where collaborative play was more effective for learning than explicit instruction, and highlights the need for more research into social contexts and relationships that surround gameplay and other computer use.

Others believe that software can enable the engineering of social interaction. One approach to using software for learning aligns with a programmatic, step by step approach to learning that fits with learning as instruction, knowledge as transmission (see Table 1). The claim is that learning and other social activities can be programmed just like a computer. This 'machine' metaphor for social software is evident in the thesis of the "Games, Action, and Social Software" group at Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS) who:

"*argue that the issue of constructing and verifying social procedures, which Professor Rohit Parikh suggestively calls social software, be pursued as systematically as computer software is constructed and analysed by computer scientists.* (see "What is Social Software? ,")" (NIAS, 2006) [3].

This programmatic approach is one variant of online course design, others being described in the context of Web 2.0 technologies that view the trend towards great social networking online as simply an evolution of elearning rather than a major paradigm shift. The utilisation of social software, however, is not simply a new way to teach content, it is method that shifts our relationship with knowledge to include a greater emphasis on peer-to-peer sharing of knowledge, towards more flexible sharing (favouring wikis and web sites over formal journals and copyright)and more ephemeral knowledge (the constantly updating world of blogs and RSS feeds (Mason and Rennie, 2008). Researchers have consequently explored a changing educational landscape where social networking (using a whole variety of new applications) is no longer the one-way transmission of knowledge, but a collaborative process of research and sharing that is no longer linear, not necessarily under the full control of the tutor, and places a higher value on the co-creation, sharing, and re-purposing of educational resources, and above all on increased *interaction* between the learning participants (Mason and Rennie, 2006).

The term *social software* (see later at [4]) came into popular use from 2003 after Clay Shirky's influential article on social software and groups (Shirky, 2003) [5]. It is fairly straightforward to trace the evolution of social software in parallel with the development of tele-communications and the Internet/WWW (Allen, 2006)[6]. The spread of tele-communications networking in the late 1970s was a trigger that led to an increase in 'social' uses where users could interact remotely through networked software. Usenet, group chat, and MUDs all developed within the space of 18 months (Shirky, 2003)[7].

Text-based games were played on local networks, Arpanet and other networks that preceded the Internet as we know it now. Multi-User Dungeons (MUDs) are text-based games that allow players to adopt roles on a complex virtual environment that exists mainly in the players' imaginations. They rely on text-based communication and invocation of rules programmed into the MUD. MOOs, introduced in the 1990s are MUDs that can be configured using their own built-in object-oriented language (Bartle, n.d.) [8]. Though many links to MUDs and MOOs are now dead, you can find some useful information and examples at this site (Jobe, 2000)[9] . There are links to some useful examples, such as this one where students collaborated online to learn and produce resources ("Water Pollution in Brazil and

California," 2002)[10] . Computer users could get in touch with each other: talk, argue, play, get to know each other. In the 1980s, the possibilities for the use of computer-mediated communication (CMC) in education became clear (Hiltz & Wellman, 1997). The WELL, Whole Earth 'Lectronic Link, an early example of virtual community, started in 1985 , forming a meaningful community for members,some of whom met face to face, and others who never met (Rheingold, 1994)(see links at [11]). With the advent of the Internet in the 1990s, new opportunities opened up for learning.

Learning Becoming Social

When has learning not been social? Formal institutions for learning, schools, colleges and universities, are a relatively recent phenomenon in the history of education. Most of the population of Europe and the United States had no schooling whatsoever until the first half of the nineteenth century (Giddens, 1993), and education for all children has yet to be achieved in some countries. Education statistics published in May 2008 show that 75 million children were out of school in 2006, down from 103 million in 1999 (UNESCO, 2008)[12]. Learning within the family setting, socialisation, is a large part of most children's learning experiences, it being where they first learn about roles, relationships and responsibilities within the family, the wider community and society, (Alexander & Clyne, 1995). We also learn through social groups and through work, by experience and social interaction, in contrast with formal learning in academic environments that focuses on learning from descriptions of the real world, rather than from direct experience of it.

"Learning in naturalistic contexts is synergistic with the context; the learning outcome is an aspect of the situation, an aspect of the relation between learner, activity and environment, so it is learning about that world and how it works." (Laurillard, 1993)

As education became a goal of industrial societies, in turn it became the object of study itself. The twentieth century saw the development of a rich variety of learning theories (many outlined in the useful Theory into Practice database (Kearsley, 1994)[13]). It is impossible to categorise these theories but we can identify three themes broadly based on how they interpret and theorise about learning and teaching (see Table 1), and link these to developments in learning technology. We do not suggest that these themes developed in any sequence but rather they are interconnecting strands of thought. Each of these themes has developed over time and enjoyed variable popularity at different times. In practice, tutors may incorporate elements from any or all of these themes in designing and conducting learning activities with students.

Instruction – teaching and learning of explicit knowledge and skills

The first theme is that of instruction, where learning is seen as pre-planned, determined by an teacher or instructor. Knowledge is understood as something that can be transmitted from teacher to student. Techniques include programmed learning, tutorials, lectures, and drill-and-practice (Cronje, 2000)[14]. This approach is seen as traditional, founded on behavioural psychology, e.g. behaviourism "Operant Conditioning (B.F. Skinner)" (Kearsley, 1994) [15]. Rather than being superseded by later approaches, we can see *instruction* as an ongoing theme, evident in elements of much of the current practice, even where a *social constructivist* approach is being adopted. For example, a UK undergraduate will almost certainly receive some formal lectures, alongside more active learning activities such as simulations and group work.

Theme	Understanding of knowledge	Focus	Use of learning technology	Sources
Instruction – teaching of facts, learned by individuals	Objective - facts that can be transmitted from teacher to student	Individual	Programmed instruction, Learning Packages, monolithic teacher-controlled Virtual Learning Environment	(Cronje, 2000)[16], (Skinner, 1986)[17]
Social Constructivism– learning constructed within social group	Subjective – individual constructs knowledge within social setting	Social	Computer-mediated communication, social networking services, social software, group decision support services, groupware, communication features within VLEs	Vygotsky and Social Cognition(2001) [18], Vygotsky's Theory of Social Development(n.d.) [19]
Critical pedagogy – learning as empowerment	Knowledge is seen as inseparable from the power relations that exist in its context	Individuals and groups within society	Free/Libre Open Source Software, Feral Learning, personal learning environments	(Edwards, 2001). [20], Smith, M. (1997a) [21], Smith, M. (1997b)[22], (Lundin, 1998)[23]

Table 1 - Themes in Learning and Technology

Social Constructivism

Social and experiential theories of learning were increasingly applied to technology-enhanced learning in the third quarter of the twentieth century. Exponents regard truth as testable in action with observable outcomes, hence always open to criticism and revision (Dewey, 1991). Constructivism asserts that although humans possess some innate cognitive potentialities, human knowledge is largely constructed (Phillips, 1995). Early constructivist work, e.g. Piaget's, emphasised the individual, but interest grew in social constructivism. This is an approach, based on phenomenology, that places a greater emphasis on the importance of social interactions in affecting the individual's generation of knowledge or facts about the world.

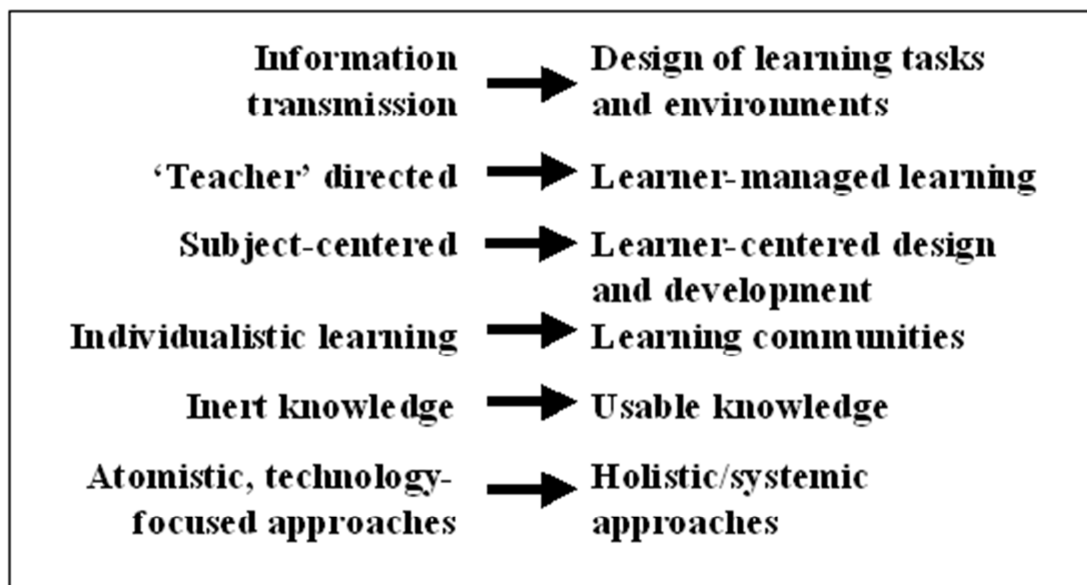| Information transmission | → | Design of learning tasks and environments |
'Teacher' directed	→	Learner-managed learning
Subject-centered	→	Learner-centered design and development
Individualistic learning	→	Learning communities
Inert knowledge	→	Usable knowledge
Atomistic, technology-focused approaches	→	Holistic/systemic approaches

Figure 3 - The Constructivist Shift, after (Goodyear et al, 2001)

Another challenge to theories of rational action was the emphasis on situated action, with plans being formulated pre or post-hoc but abandoned in the messy reality of embodied action. Two examples of social constructivist approaches are situated cognition, (Brown, Collins, & Duguid, 1989) and situated learning, (Lave & Wenger, 1991).

"Situated cognition theorists suggest that knowledge and the conditions under which is it used are inextricably linked. Social cognitivists indicate that learning is a goal-directed activity that is connected to the social contexts, including people, in which it occurs or is ultimately applied. Both views promote learning in realistically complex contexts that do not decontextualize knowledge and skills from the circumstances in which they are applied." (Hannafin, 1997).

Vygotsky's work, from much earlier in the twentieth century, has been re-appraised in the new context of computer-mediated communication (CMC). Vygotsky's emphasis on language as a tool for mediation in the social process of education, and the agency of the teacher and more experienced peers in the educational development of the individual, assumed new significance in the use of CMC in education (Bacalarski, 1994) [24]. Like Dewey, Vygotsky viewed meaning and experience as primarily social.

Moore's transactional distance theory is characterised along three axes *"There are three key variables to consider regarding transactional distance: structure, dialogue, and learner autonomy. Structure is determined by the actual design of the course, the organization of the instruction, and the use of various media of communications. There are also different forms of dialogue: two-way, real-time communication versus dialogue internalized within the student. Finally, learner autonomy depends upon the individual learner's sense of personal responsibility and self-directedness. "* (Transactional Distance Theory, 2002) [25]

Critical pedagogy – learning as empowerment

In critical pedagogies, knowledge is seen as inseparable from the power relations that exist in its context. Paolo Freire and Ivan Illich have been key 20th Century influences on those who challenge societal and power relations that underpin institutions such as schools and universities, formal education systems.

Illich promoted the idea of **Deschooling** in a critique of education that had four aspects:

- The process of **institutionalization** that can undermine people's autonomy and creativity
- **Experts and expertise** that can control knowledge production and can remove power from individuals to decide on what is knowledge and how they can shape their environment
- **Commodification**, whereby learning is treated as a commodity that can be controlled and priced above the means of many, making it scarce rather than available – "a thing rather than an activity".
- The **principle of counterproductivity**, the means by which a fundamentally beneficial process or arrangement is turned into a negative one. 'Once it reaches a certain threshold, the process of institutionalization becomes counterproductive'. In schools that have reached a certain threshold of institutionalization, students can stop learning and even unlearn (Smith, 1997a) [26].

These ideas are particularly interesting in societies where the Internet is widely diffused. The Internet offers people opportunities to access vast amounts of data, but on the other hand the data can be structured in highly commodified ways.

Freire's work has had significant influence on informal education, and his emphasis on conversational rather than curricular forms of education can give insights into the effective use of social software in learning. His work was practical and his 'pedagogy of the oppressed' was concerned with how people's experience of education could help them to change their lives (Smith, 1997b)[27].

Lundin has characterized as feral learning, the learning that people engage in to satisfy learning needs that emerge in their day to day lives, using search engines, networks of contacts (Lundin,1998) [28].

In Open Source Software (OSS) Development communities, developers, testers and users work collaboratively to create a common good, software whose licence is open to further adaptation and improvement. Examples in education can be found at School Forge (Schoolforge.net, 2008)[29]. There is also a growing Open Content (OC) movement that seeks to make educational resources freely available, through information and communication technologies as they become globally diffused. The Cape Town Declaration (not without its detractors) encapsulates some of the lofty goals of this movement (The Cape Town Open Education Declaration, 2007)[30]. "The Open Data Commons – Public Domain

Dedication & Licence is a document intended to allow you to freely share, modify, and use this work for any purpose and without any restrictions." (Open Data Commons, n.d.) [31]. In both OSS and OC, social software is key to the creation, improvement and dissemination of the products of these communities.

Formal and Informal Learning

We all continue to learn throughout our lives, mostly outside of formal education programmes and institutions. Even where education is formally organized, as in schools, colleges and universities, student learning undertaken under the control or initiative of the learner can be seen as informal. The following examples illustrate the variety of sectors and contexts:

- Students from different countries engaging in collaboration online to solve a problem: formally they learn about problem-solving and informally they learn about each other's cultures, see http://www.cabweb.net ,and http://tlgplace.ning.com
- Older people with coronary heart disease engaging in a virtual community to learn more about their condition and how to live with it, see http://www.heartsofsalford.net
- Trades union members, see http://www.workersliberty.org/
- Genealogy enthusiasts joining list servers and discussion forums to get answers to questions, and incidentally from learning about search techniques, software and approaches to data organization, see http://www.genesreunited.com/ and http://www.freebmd.org.uk/ that is engaged in the collaborative transcription of Civil Registration index of births, marriages and deaths for England and Wales

Summary

Two trends emerge in learning, particularly within the context of technology use. The first trend is the towards the social, often in formal group work or informal study groups or associations that may extend way beyond a class cohort. The social construction of knowledge relies heavily on dialogue, and this may be between students and possibly a teacher within a group. Social software can give very effective support to, not only dialogue, but also non-verbal and non-direct forms of communication . The second is the rise in informal learning, where the potential for power shifts to occur and for learners to form their own groups and associations is very important. This too can be supported by social software. How social software supports these two themes for educational purposes has recently been reviewed by Mason and Rennie (2008).

Definitions

Social Presence

Rourke, Anderson, Garrison & Archer (1999) define **social presence** as the ability of learners to project themselves socially and affectively into an online community of inquiry. Three categories of response are identified:

Affective - the expression of emotion, feelings, and mood
Interactive - those that show that someone else is attending to the poster
Cohesive - those that draw the community together (sometimes called weaving)

They offer social presence density calculation as an important quantitative description of computer conferencing environments (Rourke, Anderson, Garrison, & Archer, 1999) [32]. Research has also shown that communication richness may be revealed by the application of critical social theory. [People communicating via electronic media] "*perform social acts in action situations that are normatively regulated by, and already have meaning within the organisational context*" (Ngwenyama & Lee, 1997) [33]. An example of this could the power relations that underpin a set of text messages between a group of young people where meaning could only be understood within that social context. A bullying text from a stranger would have a very different impact.

Social Network Sites

In a recent review paper, boyd and Ellison define social network sites "as web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site" (boyd & Ellison, 2007)[34]. This Commoncraft video gives an excellent explanation of Social Networking (LeFever, 2007) [35].

Social Software

Social software can be defined as software that supports group communication (Shirky, 2003)[36]. In its current manifestations, there are three key activities that social software supports: *conversational interaction* between individuals and groups; *social feedback* where groups rate the contributions of members; and *social networks* where the links between individuals and groups are made visible (S. Boyd, 2006)[37].It also has the capacity for control and structure to emerge from user interaction rather than solely by design (Dron,2006). For example, in a VLE such as Blackboard, a group is determined and allocated by the instructor or teacher. In contrast, in a social networking environment, such as elgg, individual users can make many groups and form networks of association by 'friending'. Students told to engage in discussion on a forum visible to their teacher may set up a backchannel (on Instant messaging or mobile phone) to help them manage their 'viewed' discussion.

Social Translucence

Erickson and Kellogg define socially translucent systems as ones that exhibit three properties - visibility, awareness, and accountability - in supporting social interaction. They make social information visible to help participants to understand what is happening; and to be held accountable for their own actions. They say "In socially translucent systems we believe it will be easier for users to carry on coherent discussions; to observe and imitate others' actions; to engage in peer pressure; to create, notice, and conform to social conventions. We see social translucence as a fundamental requirement for supporting all types of communication and collaboration." An implication is that participants need to be aware of all three properties and what they mean within the context for the interactions (Erickson & Kellogg, 2002) [38].

Web 2.0

Web 2.0 is sometimes called the read/write web, evident through technologies such as Blogs ("What is blogging?," n.d.) [39], Wikis ("What is Wiki?," n.d.) [40] and media sharing sites, such as youtube [41] and flickr [42]. O'Reilly stresses the business opportunities offered by a move to the Internet as platform, harnessing its network effects. Software is seen as a process of engagement with users, rather than as an artefact that resides on a single device [43]. Web 2.0 has many applications in education (Anderson, 2005)[44].

Current state of the art

Social software is evident in commercial and open source services, software and packages. Examples include:

1. **reviewing and recommender functions**, such as in the e-commerce site, Amazon http://amazon.co.uk
2. 'free' but commercial **social network services**, such as Facebook http://facebook.com and Bebo http://bebo.com through their basic functionality and add-on applications
3. **commercially licensed software**, such as commercial virtual learning environments, that contain elements of support for social interaction e.g. Blackboard http://blackboard.co, and specific packages such as First Class for communication and collaboration http://www.firstclass.com, and Elluminate for online 'live' classrooms http://www.elluminate.com/
4. **open source software** packages that may be free-standing tools, such as forums, or virtual learning environments (also called learning management systems), the most notable of which is Moodle . Open Source Development projects may have educational support communities or networks associated with them, for example Moodle http://moodle.org and Eduspaces (that sprang from the elgg OSS community) http://eduspaces.net/.

Educators will be looking for appropriate software that can support the three key activities from our definition of social software: conversational interaction between individuals and groups; social feedback where groups rate the contributions of members; and social networks where the links between individuals and groups are made visible.

Conversational Interaction between Individuals and Groups

Any virtual learning environment is likely to support conversational interaction through email and discussion forums, within class cohorts and other groups, defined by the institution. Students may use multiple channels to support social and work-related communication, each occupying its niche, e.g. forums for class-wide discussion, private messaging for personal contact, and email for intra-team communication (Haythornthwaite, 2001. However, support for social feedback and learner-led groupings like personal social networks is likely to be thin in widely-used commercial VLEs, see examples here [45]. Well-established VLEs were predicated on top-down control and organisation, and will need to make radical changes to their architectures to accommodate true social networking features. Blackboard has pursued a policy of adding to functionality by acquiring software that is then incorporated as 'building blocks' but the integration is often superficial. For example, links to a person's name is more likely to pull up an email form, rather than to their 'linkable' profile and on to their blog, wikis, etc. Blackboard has ProjectNG on the horizon [46], and promises to incorporate Web 2.0 functionality and OSS content (but not the other way around). One advantage of an institutional implementation of conversational tools (as a by-product of a VLE) is that student

enrolment is managed, and the teacher can concentrate on structuring the activity for pedagogic purposes.

Social feedback

Social feedback may come in the form of conversational responses, from students and teachers who are effective communicators and facilitators. Salmon's 5 Stage model puts facilitating, supporting and responding in the last two stages (Salmon, 2000)[47], implying that these are more advanced skills for students.

Emoticons may be used to express a wider range of responses, usually expressed by non-verbal communication: for example to soften negative statements, or to express enthusiastic approval or humour (Bell & Zaitseva, 2005) [48]. On the other hand, emoticons may be perceived as childish, or not appropriate in formal education. Emoticons are routinely available in chat rooms and forums in the public domain, but are not currently embedded in every VLE. For example, Moodle has emoticons but they are not available in current versions of Blackboard.

Social feedback may also be given through the commenting on and rating of contributions, e.g. blog or discussion forum postings, or uploads to photo or video sharing sites. In Moodle, a teacher can set up scales in Forums, Glossaries and Assignments for students and teachers to rate a student's activity [49].

However, extrinsic rewards can be counter-productive, especially with complex activities, where too much emphasis on the outcome can de-motivate and reduce intrinsic satisfaction (Kohn, n.d.)[50].

Feedback on learning processes can be encouraged through reflective threads in discussion forums, or through the use of reflective journals (offered in Moodle as an activity, and through personal development planning software). This is not particularly social, as journals are usually one to one between student and teacher.

Social Networks

Where social software exhibits 'social translucence', personal social networks may be visible **implicitly**. For example, Moodle offers the chance for participants to see who is in their space or course, and who else is online at the same time, as this screen shot shows.
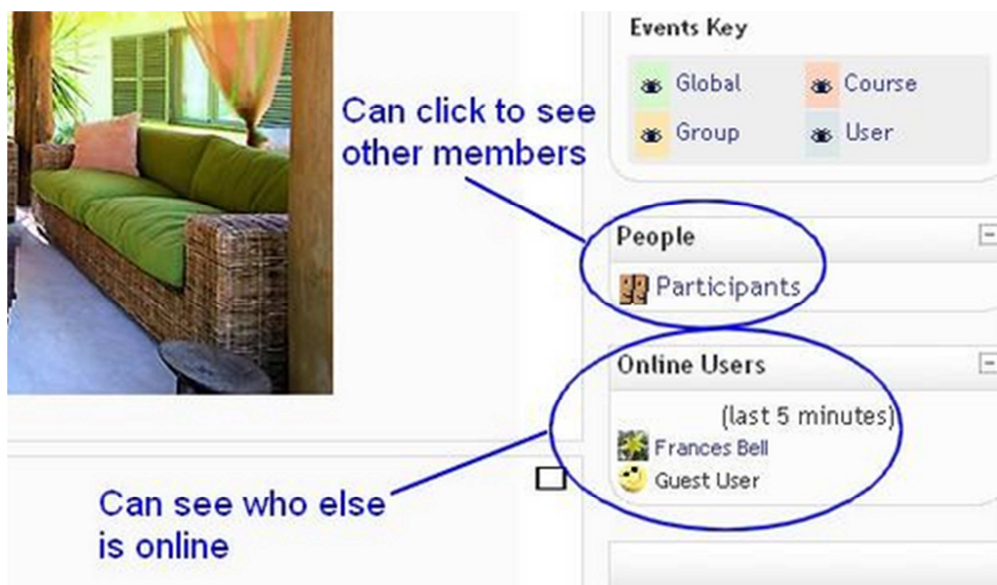
Figure 4 - Screen shot from Moodle Lounge

This knowledge of who is in their course and whether or not they are online may provoke multi-channel communications such as private messages, forum posts and emails that can strengthen participants' personal social networks. Clicking on Frances Bell's name in the example above would allow logged in users to send her a private message, access her profile (where she may have provided links to other channels such as Skype), and check forum posts she has made.

Free commercial social networks such as Facebook allow individuals to make their personal networks visible **explicitly** by use of 'friending' and other relationship management features.

Facebook was started by Mark Zuckerberg and co-founders Dustin Moskovitz and Chris Hughes when they were students at Harvard. University networks can still use a valid email address to establish membership of a Facebook University network. Universities have made use of Facebook for social and marketing purposes but there are obstacles to the incorporation of its use into 'official' educational activities. Students may object to academics entering what they see as 'their space', sometimes called the 'creepy treehouse' effect (Stein,2008) [51]. Institutions may also be wary of their staff instigating dialogue in spaces where they have no control over blocking users or deleting offensive posts, yet being found guilty by association when problems occur. There is a subtle difference between Blackboard's Sync Facebook application [52] that pushes course information out to students and the Open University's Course Profiles application [53] that is based on student self-reporting and open information-sharing of recommendations on course. University of Leicester used Facebook to encourage socialisation between students on an online course. [54]

Two examples of social networking software that takes account of educational needs are elgg and Ning. Elgg [55] is an OSS package that facilitates social networks for learning, with v1.0 released in August 2008 [56], for example the University of Brighton's social network for students and staff Community@Brighton [57] http://community.brighton.ac.uk/.

Ning is a social networking service that allows users to set up their own networks, all hosted on Ning servers, usually based around a common interest. There is a 'free' service, funded by advertisements, and a paid-for service with some additional features [58]. http://education.ning.com

Drupal [59], an OSS Content Management System (CMS) is also used for educational purposes, and offers modules to support social networking [60]. Implementing your own site using Drupal or elgg gives institutions maximum control over data and functionality but requires an investment of resources in customising, installing and maintaining the site. A Ning network allows a teacher (or anyone) to set up and manage a network fairly easily, but the data resides on a Ning server.

Implications for practice

There are four key areas of implications for practice on the use of social software in formal education: academic development; curriculum, delivery and technology design; decisions on what is provided by educational institutions; and digital literacy for social learning.

Academic Development

Teachers and Learning Technologists have a challenging task to keep up to date with the results of research and emerging technologies themselves. This can be done through formal

channels, such as workshops, training and conferences; or through online networks deploying social software and social networking services. Increasingly, social software is being included in academic delivery to help with both formal assessments and with formative and/or self-help assessments that encompass peer-to-peer learning.

Curriculum, Delivery and Technology Design

Table 2 - How Social Software Supports Different Behaviours		
Social Behaviour	**Relevance to teaching and learning**	**How Social software supports this**
Establishing presence (Garrison, Anderson, & Archer, 2001), (Erickson & Kellogg, 2002)	Affirms social context and connections for learners and teachers Speakers aware of listeners Writers aware of readers	Social translucence (see Fig 4) via 'Online users', read counts and other activity data; 'persistence' of data in asynchronous forums, and in logs of 'chats'; user profiles, including name, photo or other representative image, interests, skills, achievements, user name for other communication channels; Bluetooth, wireless presence
Communication (Scardamalia & Bereiter, 1994), (Sproull & Kiesler, 1991)	Learner-learner, learner-teacher interactions 'bread and butter' of learning and teaching for: Information exchange, Support, Reflection	Email, chat, forums, Multimedia – voice, video support for one to one, one to many and many to many interactions
Performance	Displays creativity by individuals and groups, important in constructivist and constructionist approaches to learning Can be reinforced/improved by social interaction Re-mix approach	Social software may be aligned to object sharing activities e.g. Community associated with repository (academic or music-sharing), discussion related to Wiki, comments/ratings on posts, media deposits (e.g.Youtube)

Cooperation/ collaboration (Dillenbourg, 1999), (Salomon, 1993)	Group and team work can be supported by technology to enable work to progress even when team/group members are separated in time and space	Bridging time and space through shared virtual spaces and resources, objects are replicable, editable.

Critical success factors

Maximising success in the use of state of the art social software in learning is currently more of an art than a science, given the relative newness of much of the social software and social networking services currently available. However, teachers and students using social software can be guided by research results from earlier results from the social use of computer-mediated communication.

Teachers Understanding of Social Software

Teachers establishing learning activities for students will be guided by social theories of learning and by their knowledge of what different social software packages and services offer in the support of learning.

Digital Literacy Skills

Students (and teachers) need to develop digital literacy skills that enable them to create and engage critically with digital media artifacts, and offer social feedback to their peers.

Support for Co-Construction of Knowledge

To enable learning to be constructed (in part at least) by online interaction within a social group, participants should be able to engage in dialogue, through discussion forums, chats and other tools. Dialogue can focus around ideas or artifacts (such as images, videos and texts). Knowledge can also be co-constructed through collaborative tools such as Wikis and group blogs.

Social Networks for Learning

Both students and teachers can become independent managers of their own learning by seeking, exploring and testing ideas with others within their own social network, beyond the constraints of a classroom. Each student has their own social network for learning including classmates and others, and that will persist (though changing) beyond the period of their formal education. Social networking services can assist in this persistence.

Issues and future directions

Anderson believes that social software, and the emerging educational semantic web will deliver cost savings and improvements in the effectiveness of distance learning (Anderson 2005) [61]. Social software is emergent and offered through a variety of tools and services.

This means that VLEs may lag behind Web 2.0 offerings in terms of features, tempting teachers to utilize non-institutional implementations. Such a decision represents a trade off between reliability and richness: a risk that is more easily managed by an autonomous student than a teacher with professional responsibilities of care. Teachers and students will negotiate delicate division of responsibilities between the formal, teacher-directed learning supported by institutional software and learning initiated by the learner using tools and in environments most suited to what and how they wish to learn.

Conclusions

Teachers experience and reflect on their own use of social software to help them plan and evaluate use with their students. As for students social software is also a vehicle for teachers learning about technology innovations that emerge from design research and human innovation. The evaluative research on how these innovations become embedded in practice tends to lag behind the innovation itself. There is, however, a growing body of work on the student experience to ascertain what is appropriate and likely to be effective.

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Issues

Frances initially worked off-line, uploading chunks. Subsequently, this became difficult, and Frances edited the text online. She did use Endnote but was influenced by a desire to provide online references wherever possible. She maintained an Endnote library but introduced inline hyperlinks wherever possible as well as providing a standard reference list.
Subsequent to meeting, actions noted:
Adopt Wikipedia standard for references.
Once complete, Frank Rennie reviewed the guide, identifying a few missing references, linking to Mason and Rennie work, and giving guidance on citation of web sites.

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