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Chapter 6

HIGHER EDUCATION EVOLUTION: INDIVIDUAL FREEDOM AFFORDED BY EDUCATIONAL SOCIAL SOFTWARE

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ABSTRACT

This chapter explores the potential for higher education and lifelong learning institutions to create e-learning opportunities that do not restrict the freedom of individual learners. Current models of e-learning are most often based on restrictive formats that require students to constrain their freedom of pace, access, media and content (Paulsen 1993). The extent of student resistance to this restriction of freedom is documented with survey results from independent study courses at Athabasca University- Canada's Open University. In order to support forms of interaction that are not restrictive, new capabilities of the network must be developed and integrated into formal and informal learning systems. These educational social software tools are described with examples of necessary functionality.

Key words: Social software, Independent study, Distance education, Athabasca University, Lifelong learning, Student-paced learning

INTRODUCTION

Education in our times must try to find whatever there is in students that might yearn for completion, and to reconstruct the learning that would enable them autonomously to seek that completion
Allan Bloom

Student Modeling

Much of the previous functionality depends upon or is enhanced when it is possible to identify, classify and quantify the individual profiles of learners. Such systems might capture interests, learning styles, goals and aspirations, accomplishments and progress through a course of studies, personal characteristics such as professional interest and experience, family status and other individual and group information. These profiles can then be used by ESS software to customize referrals, notification, filters etc. There is considerable work being done in this area by members of the artificial intelligence in education (see for example Shute & Towle, 2003). Some systems produce a static XML based learner profile that is explicitly altered by the learner. Others (McCalla, 2004) use more active techniques where the learner profile is being updated in real time by activities, assessments and interactions between the learner and other learners, teachers and content. These systems are all migrating to exposure in XML so that can be read and interpreted by both humans and autonomous agents. Various standards bodies including the IMS are working to create standardized schemas for formally defining learner profiles in such as way as they can be read and interpreted as components of the Educational Semantic Web. It is worth emphasizing that learner profiles must be under ultimate control of the learner if critical issues of trust and privacy are to be maintained in ESS systems.

Introducing Learners to Each Other

Some of the most successful commercial social software is based upon providing selective referrals to other persons for social or commercial motivations. Most of these referral systems are based on an assumption that those people who you regard as friends are more likely to be become friends of each other than a random selection of individuals. Thus, mining both these weak and strong connections allows us to become acquainted and possibly work or learn together with others with a greater probability of profitable exchanges developing. Watts (2004) in a very interesting study of the "small world phenomena" illustrates that people congregate physical and virtually in cliques of strong links (families, physical and work communities) however they also associate with others outside of these communities and these weak links allow for much enhanced connectivity amongst members of tight communities. Those enrolled in distance education programs often are in ideal position to take the role of a weak link connecting persons from within their community to others within the communities of fellow learners. Thus, the well known capacity for campus schools to be effective meeting places for diverse individuals from many groups. However, students pursing independent study rarely have this opportunity. Thus, ESS tools need to create compelling environments in which learners are free to share their interests, connections, communities and friends. Mining these connections will allow virtual learners to make these first connections and introductions that help create important social, learning and commercial connection.

Helping Others

The study group has long been a feature of campus based learning systems. Developing these groups in virtual and independent study contexts is challenging. Very interesting work has taken place at the University of Saskatchewan in the development of the I-Help system (Greer, McCalla et al. 2001). The I-Help system configures an autonomous agent for each student that knows its owner's skills, preferences, fiscal capacity (in real of play money) to provide and request help from other students. When a student requires help they can release their agent into the learning space and negotiate with the agent of another, more skilled learner. These negotiations may lead to a request for help by email or telephone and subsequent exchange of funds and evaluation by both the helper and the helped.

Recording, Displaying and Managing of Past Learning Activity

Recent work on e-portfolio systems (Love, McKean & Gathercoal, 2004) illustrates their capacity to preserve and document learning activity. In sophisticated systems, others should have the capacity to comment upon and add social value to this documentation. Of course, checks must be in place to retain control by the owner of such comments.

Documenting and Sharing of Constructed Objects

Much formal learning is based on students learning and re-learning a static body of knowledge. Such instructional strategies are not highly productive in contexts in which useful information and knowledge is under continuous revision. More currently, educational authors (Grabinger & Dunlap, 2002; Collis & Moonen, 2001) have argued that students should be actively creating rather than consuming knowledge. Our own experiences of assigning students the tasks of creating learning portals and learning objects for each other have been very positive (Anderson & Wark, 2004). But often the co-creation of content has assumed that students are actively working and designing learning content in synchronous fashion. ESS tools will need to support students working continuously to update content started months or even years previously by other students. WIKIS and collaborative blogs are first generation tools to support this type of interaction. However, more sophisticated tools capable of including multimedia, tracking both contribution and learner use, controlling access to creation tools and assessing learning outcomes are needed.

Conclusion

Most of the qualities above are instantiated in first generation ESS tools, however much work and exposure is needed before they will be ready for mainstream educational faculty. Nonetheless, I am confident that it is possible to create networked based tools that meet needs for freedom of space and time provided by current generation of distance education tools, yet do not constrain the freedoms required of busy lifelong e-learners.

Social software promises radically new affordances for the networked world and its citizens. These range from new economic models based on sharing and collaborative development (Benkler, 2004), to widely distributed educational communities evolved in both global and local initiatives. Learning will continue. What is less certain is the role of formal education and current models of teaching, certification and tuition. Institutions hoping to make major contributions to lifelong learning in a networked society must be prepared to provide quality programming that meets the geographic, temporal, social, and pacing aspirations in ways that maximize individual and collective freedom and choice.

The digital age promises great change for educational institutions. A small niche market will continue for institutions focused on that subset of learners who can afford and are willing to restrict their freedom by attending campus based programs. However, for the majority of lifelong learners, learning opportunities that do not restrict learner freedom are increasingly attractive. To meet this need requires the development and adoption of new classes of networked based educational social software tools. Those institutions that are flexible and innovative enough to meet the demanding needs of these new learners will prosper in the digital age. Those that are not as adaptable will be left fighting each other for a shrinking population of traditional learners.

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Despite the gloomy predictions of many critics of current academic practice, higher educational systems continues to fill a critical role and indeed enlarged functionality in the current era marked by continuous and growing demand for lifelong learning. Most higher education systems have begun to diversify their educational systems so as to provide learning opportunities that are not bounded by place or time (Green, 2000). But success for the long term will require going further - to allow students the choice of pace, collaboration, media and path to information acquisition and knowledge growth. These new 'learning networks' (Koper 2004a) supported by social computing applications will act as a catalyst for change for all higher education institutions and as a competitor for some in creating the future of higher education.

This chapter addresses issues related to supporting and sustaining pedagogical interactions among learners in self paced distance education programs. Ironically, the earliest forms of distance education allowed students to pace their own learning. A course could be completed in two months or two years – the technology of independent postal correspondence could support few other learning designs. Many of the distance learning or so called e-learning experiences developed since those days have not allowed such freedom and constrain learners to study in cohorts, moving together at a fixed pace through a fixed curriculum. The advent of collaborative technologies and especially the Web has resulted in the capacity to offer distance education in either paced or unpaced modes, blended or single mode, collaborative or individualized learning formats. Many have argued that the addition of collaborative activity to distance education has transformed distance education - creating equal or enhanced pedagogical advantage to any form of campus based learning opportunities (Garrison, 1997; Simonson, Schlosser, & Hanson, 1999). Paulson (2003) has noted that "meaningful group communication is perhaps the greatest pedagogical challenge in unpaced learning." Is it possible to retain the access enriched, freedom of unpaced learning, with the pedagogical richness of cooperative and collaborative instructional designs?

This chapter overviews the challenges and opportunities of formal educational programming that maximizes individual freedoms. It outlines survey and interview research conducted at Athabasca University, Canada's Open University. It then overviews a number of applications of networked software that have been developed to support learner-learner interaction, while still allowing students to individually pace their learning programs. These software tools are coming to be known as "social software" and they provide the technologies upon which this apparent paradox can be resolved.

FREEDOM IN EDUCATION

The past century has been marked by unprecedented increases in personal mobility. Families and communities that once clustered around neighboring farms or urban neighbourhoods are now extending across the globe. Besides geographic mobility, time shifting is becoming common with globally orientated workplaces calling on professional and blue collar workers to shift their time frames to meet commercial, industrial and consumer needs of an "anytime/anyplace" economy. Finally, diverse global experiences create vastly different background contexts, cultures and experiences for learners, resulting in divergent preferences for the types and content of educational opportunity These forces effect the

provision of higher education and create demand and opportunity for learning that is flexible enough to meet a host of temporal, geographic, economic, learning and lifestyle preferences and requirements of modern lifelong learners.

Paulsen (1993) modeled these forces in a 'theory of cooperative freedom' in which six different dimensions of freedom are described. These include the familiar *freedom of space* and *freedom of time* that have defined much traditional distance education programming. But he also describes the *freedom to pace* ones' learning in response to individual competencies or time availability. A fourth dimension concerns the *freedom of media* that allows choice of learning medium to match a host of media access and usability constraints and communication system qualities and preferences. Fifth, is the *freedom of access* that includes removal of barriers of prerequisites and high costs. Finally, Paulsen's sixth dimension is *freedom of content* that allows the learner to have control over the subject and instructional style of their learning.

Paulsen argues that individual learners are more or less concerned with each of these dimensions of freedom and are interested in learning designs that meet their individual freedom preferences and constraints in each dimension. Further, these dimensions are not stable, but shift in response to individual and group preferences, constraints and opportunities. Traditional campus based programming developed in the form it has today because it evolved within very sever personal constraints imposed in each of these dimensions. For example the first universities clustered around rare volumes of text found in medieval monastary libraries. As these constraints are reduced by technical and social innovation, opportunity and demand are created for the development of much freer learning opportunities that are evolving to co-exist with traditional campus bound educational programming. Recent interest in so called blended learning (Bersin, 2004) shows that it very possible to combine different formats and media of delivery. However, the challenge is to select and to invent those forms of higher education that offer the greatest degrees of freedom and yet retain high levels of cost and learning effectiveness.

The Context of Life Long Learning in a Networked Age

In an earlier article Norm Friesen and I (Friesen & Anderson, 2004) presented a scenario of a near futuristic professional worker who is required to acquire a new set of learning competencies. She sets her agent to scour the networks not only for learning content, exercises and resources, but also for available mentors, support group and credentialing services. These ideas are examples of applications of the emerging educational semantic web (Anderson, 2004) that will be populated by a very wide number and variety of formal and informal learning opportunities. Researchers (i.e. Hedrick, 2004; Koper, 2004a; Tattersall & Manderveld, 2004; Simon, Dolog, Miklós, Olmedilla, & Sintek, 2004) are developing prototypes of systems that allow learners to find and select appropriate learning content, regardless of its location on the network. But for many learners and for many type of learning, social interaction, validation and companionship is useful and sometimes necessary. Thus, the need to apply the resources and power of the Educational Semantic Web to social interaction as well as individualized learning. Much of the effort to create these social interconnections is located within the work being done with social software.

The Challenge of Independence and Collaboration

Ironically, at the same time that technologies are allowing increases in individual choice along multiple dimensions of freedom, pedagogical research is showing the power of learning that is defined (and confined) within a community of learners (Jonassen, Peck and Wilson 1999; Wilson, 2001; Conrad, 2002; Kreijns, Kirschner, & Jochems, 2002; Rovai 2002; Tu & Corry, 2002). Wenger, McDermott & Snyder, (2002) identify four types of these communities that can function either in a physical space or distributed online. These include discourse communities, knowledge-building communities, learning communities and communities of practice. Each of these types of communities can serve as the locus for a lifelong learning experiences and they have in common "social and cognitive contribution of a group of learners to each other, with students collaborating and supporting each other toward commonly accepted learning goals" (Jonassen et al, 1999, p. 119). Learning communities have also been associated with higher completion rates in educational programming. For example, completion rates for learners in Athabasca University's learner-paced undergraduate courses averaged 63.6% for the 2002-2003 period. Completion rates for the same courses offered in seminar format (either through synchronous technologies or face-to-face) averaged 86.9% over the same period (Athabasca University, 2003, p.12). Interactive communities of learning have also been shown to result in increased persistence, motivation and integration with the learning institution (Anderson, 2003). Thus, there is growing evidence of the educational efficacy of these virtual learning communities.

However, besides creating opportunities for learning, community imposes constraints upon its members. In order to share, collaborate and support community members must constrain at least some of Paulsen's dimensions of freedom. For example, the community must often be synchronized in time, pace, medium and access if its members are too work collaboratively and support each other. These same restrictions also result in high numbers of learners actively resisting their individual loss of freedom and considerable resistance to such freedom reducing activities as illustrated in our survey results below.

Resolving this paradox - of allowing and supporting community while reducing or eliminating constraints on freedom, challenges education institutions and constrains us from moving towards a future where learners' freedom to learn in all six of Paulsen's dimensions is afforded. In the next section I overview a study completed in 2004 in which we documented the challenges of adding common tools of collaborative e-learning (mostly asynchronous computer conferencing) to independent study programming.

Case of Independent Study at Athabasca University: Context and Survey Results

Athabasca University – *Canada's Open University* has a 30 year history of offering mostly independent study courses in a wide range of undergraduate programs (see www.athabascau.ca). Currently over 30,000 students enroll annually in our courses. Many of these former correspondence courses are now enhanced with course home pages, additional online resources, web activities and attempts to add community building components – most often asynchronous computer conferencing software. A relatively unique feature of this credit

level undergraduate programming is that it allows for enrollment any month of the year and time for completion of a course can range from a few weeks to over 18 months.

In an attempt to understand our student and faculty use of potential community building tools added to courses, we conducted a series of interviews and an online survey in 2004. The results of the survey of students (n=388) enrolled in courses that were augmented with computer conferencing enhancements indicated that only 29% of the student respondents had participated in the computer conferences. Those students who choose not to participate in discussion groups did so for a variety of reasons - 18% felt that participation would take too much time. A further 17% were not aware that discussion forums were available, 14% thought that participation would not significantly increase their learning, and 10% indicated that they felt they had nothing to contribute. About 10% of non participating respondents cited a lack of recent postings (critical mass) as the major reason for their non participation. Lack of technology was not a major impediment as only 1% noted this as a reason for their non participation.

Significantly, 78% of respondents either agreed or strongly agreed that they would interact with other students as long as they were able to proceed through the course at their own pace. When queried how they would like to interact, 70% preferred asynchronous media like email and computer conferencing, 27% preferred a combination of synchronous and asynchronous technologies, and only 3% preferred synchronous interaction alone (for example, audio conferences or face-to-face interaction).

About 95% of student respondents reported a desire to access the work of students either currently or previously enrolled in the courses. About 77% of respondents indicated an interest in accessing animated student-content interaction devices such as a "ChatBot." But only 25% of students felt that such participation should be graded.

The survey concluded by asking students if they would take part in any collaborative activities, however structured. About 49% indicated they would not; 29% indicated they would and 22% were unsure. When queried for the reasons that they did not wish to engage in collaborative activities, 58% said they preferred to learn on their own. Another 25% indicated that they have a strong support group at work or at home, the remaining 17% provided a variety of other reasons.

The survey results suggest that most students choose not to participate in collaborative activities even if these activities are built into the course and participation could affect course marks. However, there was interest in enhanced forms of interaction with content and in the ability to view contributions of other students. Most also indicated an interest in collaborating, but not if such collaboration constrained their freedom to move through the course at their own pace.

Thus, the stage is set for development of tools that allow for interaction and some form of community building, but that retain highest degrees of individual freedoms possible. Before turning to a discussion of new social networking tools, we discuss the deficiencies of the most commonly used tool for networked based formal learning – the now venerable asynchronous threaded text conference

Asynchronous Computer Conferencing and Student-Paced Learning

A great deal has been written about the pedagogical power of asynchronous text messaging (see for example (Feenberg, 1989; Hiltz, 1988; Garrison, 1997; Salmon, 2000; Garrison & Anderson, 2003) Most of the studies of computer mediated communications however have focused on graduate level programming in education (Bourke & Cannell, 2004) and in all the studies I am familiar with the content has been in paced, usually semester long courses, many of which have face-to-face components. Most computer conferencing based courses force students to participate by offering course marks for participation. Even so, these studies normally report less than 100% contribution and often the non contributions are pejoratively labeled as "lurkers". As an aside, it is interesting to speculate if such forced participation is really essential for learning. Taylor (2001) reports on a graduate level study course in which students in a 'peripheral participation group' (lurkers) posted only 1/3 as many postings as the 'workers' yet achieved the same grades.

The millions of students enrolled around the globe in paced distance education programming bear evidence to the efficacy of this cohort based mode of delivery. It is not my desire to denigrate this type of learning- indeed a great deal of my academic career has been spent demonstrating, measuring and promoting this model of learning (see http://communitiesofinquiry.com). But as argued above, it is a confining and freedom constraining form of distance delivery. In the next section I explore the potential of developing less restrictive forms of learning based upon various social software solutions.

Social Software – Definitions and History

The study and development of social software is an expansive domain that currently eludes simple definitions or precise boundaries. In a sense any software that supports any form of human interaction (including basic e-mail) is social software. An interesting article on the history of social software, Allen (2004) notes the evolution of software tools as the net gives capacity to support human interactions, decision making, planning and other higher level activities across boundaries of time and space and less dependent upon text and language. Levine (2004) builds on Allen's historical description by noting how much the technology has shifted the field and how that technology has radically changed and improved since earlier generations of software that were designed to connect and support human communications. Similar to Anderson's (2004) affordances of the semantic web, Levine notes the ubiquity of the net and especially the 'findability' of content afforded by even current generations of search tools such as Google. Second, she notes the pervasive and multiple formats of communications supported ranging from synchronous to asynchronous, from one to one, to many to many, from text to full multimedia, from communications in dedicated homes locations to that supported on mobile phones while in transit. Finally, Levine notes the affordances of the Web to support new patterns of interconnection that "facilitate new social patterns such as social spaces, conversation, discovery and group forming, personal and social decoration and collaborative folk art." It is these later applications that I focus on next.

There are many and evolving definitions of social software. Lefever (2003) notes the distinction "where normal software links people to the inner workings of a computer or network, social software links people to the inner workings of each other's thoughts, feelings and opinions." Coates (2002) notes the capacity of social software to act as prosthetic, augmenting human incapacities. First, are those restrictions on freedom common when we are place and time bound. These include the traditional challenges of access addressed by distance education. Second, social software adds tools to help us deal with the complexities and scale of online context such as filtering, spam control, recommendation and social authentication systems. Third, social software supports the efficacy of social interaction by alleviating challenges of group functioning such as decision making, maintaining group memory, documenting processes etc. The Socio Media group (2003) defined social software from a business perspective as software that "represents a new generation of tools that bring companies and users into a dynamic, ongoing conversation". I find this definition slightly limited as it uses the metaphor of conversation, when this is but one form of human interaction. Butterfield (2003) is much broader in his discussion of the qualities of social software. He characterizes social software as tools that support communication using the five 'devices' of identity, presence, relationships, conversations and groups.

Resnick (2002) closes a conceptual loop between social software and the more well known study of social capital. He argues that there is great capacity for new networking tools to support social (and learning) activities that increase social capital – thereby enhancing human activity, productivity and enjoyment. They do so by facilitating information flow to relevant individuals, allowing users to create markets for distribution of other goods beyond information (for example the EBay community) and creating opportunities for individuals to provide social support for each other and to coordinate their activities. Obviously, these are affordances that students have developed on campus sites and now our challenge is to recreate these in virtual learning spaces, while retaining as much freedom as possible.

Just as the definition of social software defies precise definition, the classification and categorization of software ware tools is also evolving. Judith Meskell maintains a social software metalist (http://socialsoftware.weblogsinc.com/entry/9817137581524458) in which she categorizes links to hundreds of social software applications. Her taxonomy classifies these tools into categories of business; common interest; dating; face-to-face meeting facilitation; friend; MoSoSo (Mobile Social Software); pet and photo.

Given the emerging state of the technology it may be appropriate to add another definition. A working definition of educational social software applied to a freedom facilitating educational context is *networked tools that support and encourage individuals to learn together while retaining individual control over their time, space, presence, activity, relationship and identity.* Obviously traditional tools like computer conferencing and email qualify as social software under this definition, even though they are likely not the most capable of addressing the demanding needs of effective e-learning educational systems. These and other common communication tools are primitive examples of a variety of services that distributed networked learners require.

In summary a concise and precise definition of social software seems to yet elude us, but it is clear that the problems that social software addresses (meeting, building community, reducing communication errors and supporting complex group functions) may have application to education use and may also be useful in reducing constraints on freedom of its users. In the next section I turn to requirements and examples of education social software.

Features of Educational Social Software (ESS) Applications

In this final section, I discuss functions and features of social software that are now, and in even more so in the near future, will be used to enhance distance education processes.

Presence Tools

ESS tools should allow learners to make known (or conceal) their presence. An example of presence notification was provided in my early experience with computer conferencing software. The first full course I taught used the First Class system and notified learners when other members of their cohort were online. This notification allowed one to see and communicate (by an instant text message) with other students. Students could then agree to meet in the chat room for more sustained and larger group, real time interaction. When I changed education institutions, I began teaching with WebCT system that lacked this notification of presence, and I found that the built in chat rooms were almost never used and certainly not in a spontaneous fashion. Hanging out in an empty chat room waiting for someone to drop by was not an engaging activity! This sense of presence is highlighted in commercial tools such as www.eyeballs.com 'swarming' tools that allow users visiting any web site to view each other's activities and location and communicate through exchange of instant messages and pictures. Other examples include the epacoty to know when selected friends on are 'online' using tools such as SKYPE and Instant Messenger. Of course, this sense of presence must be under the control of the individual learner since there are times when I welcome presence of other 'kindred souls' while there are other times when I need to maintain my privacy and anonymity.

Notification

As illustrated in the survey results above, contributing to a site and not receiving feedback or acknowledgment of that contribution quickly discourages and tends to extinguish further participation. Good ESS provides both pushed and pulled form of notification. Using push tools such as RSS or even email provides notification to the learner when new content or communication is entered into a learning space. Quality ESS tools will allow historical and persistent display and searching of these interventions so that the learning space can be searchable and span across significant lengths of time.

Filtering

The assault on our systems caused by both legitimate avalanches of potentially useful information as well as the non-legitimate spam creates need for ESS to contain collaborative filtering systems. These systems need to be able to filter out illegitimate information as well as filter in items of potential interest. Filtering out is being handled with various degrees of

success by many of the commercial spam filters. But being able to filter in relevant information is a greater challenge. ESS software must allow users to customize their filters so that notifications sent from teachers, virtual class mates or even commercial services can reach the email or RSS aggregators of learners. The filters must also have capacity for persistence such that items that other learners find of use remain on the ESS system to support ongoing use, commentary and discussion.

Cooperative Learning Support

Paulsen (2003) makes a distinction between cooperative learning activities in which learners are encouraged (though not required) to cooperate in learning activities that are alluring to the individual learner and collaborative activities where members are compelled to work together through the duration of an activity. This distinguishes between collaborative and cooperative based upon compulsion to interact is unique and fits well with ESS programming. Cooperative activities are generally short term, bounded in temporal space (for example a week project), often not time centric such that learners can cooperate outside of the knowledge of where and in which order they are studying and can consist of cooperation between those engaged in the class and that larger group of family, friends (virtual and face-to-face) and colleagues not formally enrolled in a program of studies. Examples of cooperative projects include peer review and assessment of work of student peers, interviewing and gathering data from other learners, and contributing to pieces of larger projects such as learning portals in a jig saw fashion.

Referring

Humans and other social animals tend to flock to activities in which others are engaged. I am reminded of a story from the 1970's USSR where the first thing one did when coming upon a queue of people in the street was to get into that queue- the assumption being that there must be something worth acquiring in that consumer good starved country. ESS tools track activities in which students engage noting indicators of success (time spent, assessments attempted and past, formal evaluations etc). These referrals can be used by students to select learning activities and courses and by teachers and administrators to evaluate, refine and continuously improve the learning activities. Koper (2004b) has developed interesting models of implicit referral systems in which students activities leave trails much like the phermone trails left by ants to guide other members of the colony to food sources. His simulations of these models show how individual student experiences can be used to improve learning networks and provide useful referral services to new students.

Referrals will of course also be made explicitly in the virtual world much as they are made in student newspapers, popularity databases, coffee shops and pubs on campus.