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Technology that enhances without inhibiting learning

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Technology that Enhances without Inhibiting learning

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Abstract

Technology supported information sharing could be argued to both enhance and inhibit learning. However, social and affective issues that motivate learners' technology interactions are often overlooked. Are learners avoiding valuable learning applications because of privacy fears and trust issues? Will inaccurate technology assumptions and awareness inhibit information sharing? Do learners need control over technology enhanced safe creative spaces or can they be motivated to overcome badly designed systems because sharing is 'valuable' or 'fun'. This presentation details a model of privacy and trust issues that can be used to enhance elearning. Several OU case-studies of multimedia, mobile and elearning applications (conducted within IET, KMI and the Open CETL) are evaluated using this model. The model helps to identify trade-offs that learners make for technology enhanced or inhibited learning. Theories of control, identity, information sensitivity and re-use are discussed within the context of these elearning examples.

Introduction

When reviewing technology within the learning process it is important to understand the importance of affective and social issues. Collaborative learning is a key field of research that reveals the importance of social and affective issues. Preece (2000) highlights the importance of usability and sociability in making online communities successful. Jones & Issroff (2005) detail the importance of Keller's motivational model (of curiosity, challenge, confidence & control) on collaborative learning. They also extend this model for collaborative settings with the factors of *social affinity*, *cognitive ability*, *feedback*, *distribution of control*, *nature of task* and *time*. However, how technologies enable or inhibit learners behavioural trade-offs still requires further discussion. In particular, the impact of 'flow' and 'immersion' within a learning activity is a recent area of research that relates strongly to affective and social factors (Cheng & Cairns, 2005). The distinction between collaborative and individual social and affective elearning drivers and the trade-offs made between these issues also needs to be expanded upon (Adams, 2000). Specifically, it is interesting to note that the concepts of trust and privacy relate to many of the learning concepts already identified but are not explicitly discussed. This paper endeavours to initiate a discussion of learning technologies in relation to trade-offs between aspects of trust, sharing and privacy.

Background

Privacy, trust and sharing are complex social phenomena that define who we are, by allowing for individual expression, and yet binding us into a society through social norms (Adams, 2000; Schoeman, 1992). Within real and virtual worlds the assumptions people make, and thus their perceptions, are often governed by social norms whether a computer system was designed to cater for them or not (Reeves & Naas, 1996).

Both Goffman (1969) and Giddens (1984) suggest that our behaviours are framed within a specific situation. Goffman (1969) detailed the importance of social norms for us in our 'presentation of self' for others. We present ourselves differently for different people (e.g. peers, authority figures, family members) and within different situations (e.g. leisure, work, home-life). Social norms can invoke politeness protocols with people more positive, and less honest, about someone to their face than to a 2nd person or computer (Reeves & Naas, 1996). Karabenick & Knapp (1988) identified that perceived privacy and freedom of expression caused learner preferences for computer help rather than another person.

Another important affective aspect of elearning environments is the degree of engagment it enables. The relationship between games and elearning is a growing field of research and it highlights the importance of immersion within these environments. Chow & Cairns (2005) have identified that once task immersion (i.e. game immersion) has been achieved it can overcome deleterious usability elements. They go on to argue that immersion is not only an affective state but also a cognitive one. However, the social elements of this state are not discussed.

Collaborative virtual environments provide remotely located users with the ability to collaborate via real interactions in a shared artificial environment. The advantages of virtual reality for collaborative learning is frequently argued by constructivists to relate to the importance of authentic context (Vygotsky, 1978). Virtual reality (VR) communication environments have been argued to provide a natural, intuitive environment for communication whilst releasing, through immersion, some of the social taboos from social interactions (Kaur, 1997). Many of these environments have been likened to game-like contexts but the social and affective trade-offs they enable or inhibit still require further study.

The Adams' model (see Fig. 1) details trade-offs between users' elearning perceptions (Adams, 1999; 2000). The model is based upon and has been used to evaluate several elearning applications (e.g. virtual reality, video conferencing, eportfolios, eresources)
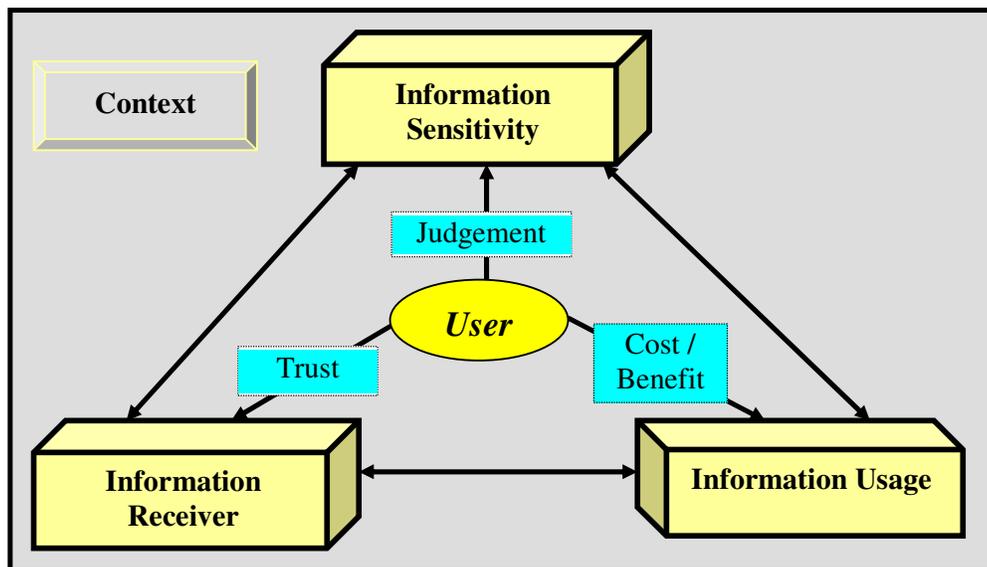

Fig. 1: Adams model of learners' elearning perceptions

Within this model the *User* is presented as the person who has data transmitted about them. The user may not be actively using the system, and may even be unaware that their data is being transmitted. Primary to this model is the concept of *Information Sensitivity* (e.g., users' perceptions of the confidentiality of the data being transmitted). The user's judgments of the sensitivity levels of the information are not binary (private / not private), but multi-dimensional. Also key to this model is the user's perception of who receives and/or manipulates their data (*Information Receiver*) and what they perceive it is used for (*Information Usage)*, both currently and at a later date. The technology *context* can enable or inhibit awareness of each of these factor issues (e.g. within a virtual reality context the information receiver is anonymous). Each of these factors interacts with the others and with contextual issues to form the user's overall perception of trust, privacy and sharing potential. For example, a student may greatly trust a tutor with their course marks and a friend with relationship details but feel their privacy is invaded if the information and receivers were swapped.

Technology enhanced learning Case-Studies

Multimedia and virtual reality research detailed a multitude of enabling and inhibiting learning potentials (Adams, 2000). A multicast conferencing study (Adams, 1999) identified potential for enabling long-distance learning within different time-frames. However, unclear understandings of what was being recorded and who will be receiving it (e.g. the recording of a participant asleep at a conference observed by his boss in the office) led to privacy invasions. The recording and inappropriate re-use of information for different recipients also caused privacy invasions.

Enabling / Inhibiting Issues: Poor awareness of the sensitivity of what is being recorded (**information sensitivity**) who will receive it (**information receiver**) and for what purposes (**information usage**) can produce serious unintended privacy invasions.

A virtual reality learning environment highlights some of these issues. A focus group of 9 Phd students who used a virtual reality learning environment to interact with fellow students revealed many affective factors (Adams, 2000). Perceived anonymity was found to have positive effects upon users' task focus and freedom of expression:

> *"In certain environments you're relatively anonymous so you can give your real opinions rather than saying what you think you ought to say."* (focus group respondent)

However, contrary to videoconferencing environments, users felt increased implicit presence in the environment by empathising with their avatar. The result of these findings is that although users felt the anonymity gave them increased freedom of expression, this was counter-acted by implicit social norm pressure (e.g. embarrassment when walking up to a group of avatars talking – 'should I interrupt?').

Enabling / Inhibiting Issues: **Information Receiver** Anonymity provides the 'freedom of expression yet empathy with avatars produces social norm pressure and potential privacy invasions through inappropriate social behaviours (e.g. standing too close, following other avatars).

OU case-studies:
Several elearning case-studies have been conducted on the multimedia communication environment 'flash-meeting' and the elearning awareness application 'hexagon'. Both these applications have been developed in the Knowledge Media Institute at the OU. Hexagon (see fig 2) is an ambient presence awareness system. Participants are recorded and their images transmitted throughout the day to communicate to others their availability for learning collaborations.
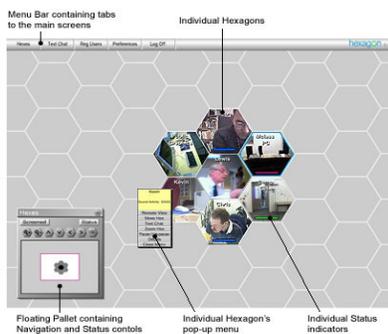

Fig. 2: A view of the *(hexagon)* screen showing *(7 participants).*

FlashMeeting (see fig. 3) is a 'light-weight' videoconferencing application, allowing up to 25 attendees from anywhere in the world to connect with each other.
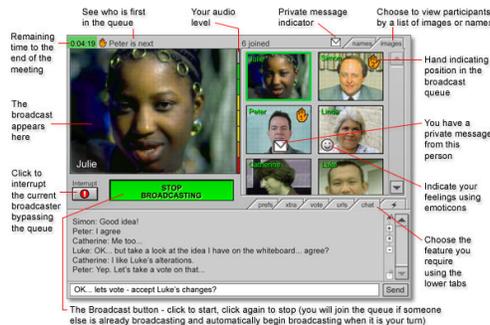

Fig. 3: A view of the *(flasshmeeting)* screen showing *(7 participants).*

Studies on both these environments identified some interesting affective issues. Across both applications potential privacy risks (e.g. mis-use of the data recorded) and benefits of information

usage (e.g. personal / collaborative re-use of data) where traded off against and helped to build user trust with community members.

> *'I think that you have to be in a trusting situation to know that anything inadvertent is not going to be used against you'* (Hexagon, interview)
> *"Real time audio/video exchange with a large group greatly helps the exchange of information and ideas. It also helps build a sense of community."* (Flash-meeting questionnaire)

Within Hexagon the recording of some activities, however, clearly initiated social norm inhibitions that caused negative reactions to the technology.

> *'every once in a while suddenly you realise oh my God I'm wolfing down a huge sandwich in front of the screen or you may want to blow my nose or something and you may notice you wanna go private'* (Hexagon, interview)

Enabling / Inhibiting Issues: Community trust (Information Receiver) and potential usage benefits (Information Usage) were traded-off against potential privacy risks from later usage (Information Usage). Poor awareness (as in Hexagon) of what information was being captured (**information sensitivity**) could inhibit interactions whilst clear awareness (as in flash-meeting) of information capture (**information sensitivity**) & who is receiving the information (**information receiver**) can enable positive sharing and engaging learning interactions.

Below is a short summary of a series of CETL funded projects (i.e. COLMSCT & PBPL funded) that have uncovered affective issues in relation to technology enabled or inhibited learning. These are initial accounts of research in progress which have been both quantitatively & qualitatively conducted. Detailed accounts of project findings will be available through later publications.

Jacquie Bennett (CETL / COLMSCT Fellow) is currently developing and researching elearning the 2nd life environment (see fig. 4) through an island called Cetlment. Cetlment is a virtual reality environment where learners are represented by avatars (i.e. online animated characters) within a virtual world where they can interact with others.

Fig. 4: - Sloodle inaugral meeting courtesy www.sloodle.com

This environment allows for expression free from social criticism and with a game like immersion. For some students these environments allow for fun and creatively freeing learning interactions. However, there are issues of social norm breaches (e.g. a man represented by a female avatar) that may inhibit some learners. Other learners emotively reject the environments because of the fun, play element which clashes with personal perceptions of learning as a work activity (i.e. I've come here to learn not play).

Enabling / Inhibiting Issues: **Information Receiver** Anonymity provides the 'freedom of expression and potential privacy invasions; Current **Information Usage** for play or learning purposes allows for immersion and rejection of the technology.

Wendy Fisher (CETL / COLMSCT Fellow) is currently research into Tablet PCs within the process of assessment feedback with Associate Lecturers and Students.
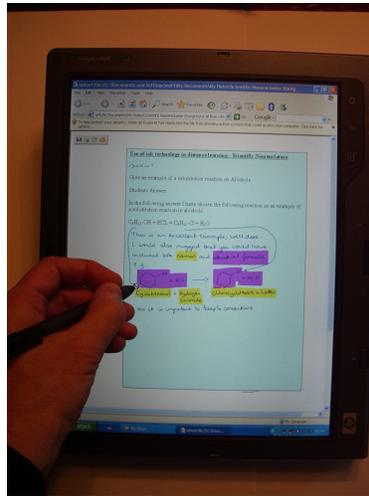
Fig. 5: Tablet PC electronic highlighting and graphic feedback

Fisher's research has uncovered different modalities (i.e. Keyboard OR pen in tablet PC interactions) that interact with different levels of personal skill (e.g. speed typist, comfort with hand-writing) to impact on affective elements of task immersion. Two levels of task immersion have been identified; that of the assessment task and the student / tutor communication (feedback) task. Tutors reacted emotively to the level of perceived enablement or inhibition that the technology afforded these tasks.
Enabling / Inhibiting Issues: **User** skills and the interface (e.g. tablet or keyboard) enabled immersion for Current **Information Usage**

Keith Beechener (CETL / COLMSCT Fellow) is researching into communication modalities and in particular the role of email as a communication medium. It is interesting to note that email is considered by the learner as a one-to-one or one-to-many interaction. Although, usability issues can sometimes cause privacy invasions (e.g. accidentally sending a personal email to 'ALL'). The awareness of who you are communicating with and why is clearly understood. The awareness of who has received and read an email is not always clearly understood. Standard email systems (e.g. Outlook) can allow for feedback on when an email has been received, but also allows the respondent to not release that information. 'First Class' email systems covertly identify email interactions so that some ALs keenly track them. However, students and ALs are unaware that this facility exists leaving the system open for perceived privacy invasions through clashes between assumptions and reality. [inhibiting factors are the same as below]

John Pettit & Agnes Kukulska-Hulme (CELT / PBPL Project Principles) have been researching the role of mobile technologies as a learning medium. The new smart phones (e.g. Qtek) that enable communication, collaboration and yet personal learning development are an interesting advancement in mobile technologies. Of key relevance to affective and social issues are these technology's abilities to grey the lines between social and personal tasks and information. Jumping between personal and collaborative contexts while on the move could greatly increase engagement and learning potentials. However, one issue highlighted within the feedback sessions was that of privacy risks through unintentional sharing of personal information. Two anecdotal accounts where given:

- o On a train journey one participant found that his blue tooth connection was unintentionally enabled. The connection meant that an unidentified individual located on the train was aware of his online presence and electronically contacted and made unwanted advances to him through his Qtek.
- o Another participant found that when they were synchronising their computer calendar with their Qtek calendar that they were unaware that the sharing went both ways. Personal dates and information, which had been on the Qtek, were automatically put onto the computer calendar that was then accessible to named individuals.

Inhibiting Issues: Poor awareness of what information is being captured (**information sensitivity**), who is receiving this information (**information receiver**) and for what purposes (**information usage**) could lead to serious privacy invasions.

Discussion & Conclusion

Some of the case-studies detailed above reveal the enabling elements of technology enhanced learning through immersion and freedom of expression to enable creativity in learning. It is interesting to note that developers and users of the 2nd life system 'cetlment' anecdotally note that it is the anonymity that allows for potential freedom of expression. This corroborates previous virtual reality research where students found the anonymity enabling. It is interesting to note that Joinson (2004) linked the affective preferences for non-visual communication medium to students with low-self esteem. A virtual reality system can provide an increased sense of anonymity compared to a videoconferencing system. The anonymity of many multimedia environments provides users with control over their interactions with less social risk lowering interaction inhibitions (Adams, 1999). This allows the user the privacy for freedom of expression free from the limits of social norms. However, this is not to say that anonymity means that social norms are not important within this environment. A paradox can occur, however, with a freedom from social barriers in that this can also encourage anti-social behaviour (irresponsible, rude, obnoxious, sexual harassment) which can, in turn, cause invasions of privacy. The cause of these unreasonable behaviours is due to a belief that actions in the virtual world are not accountable for in the real world whilst anonymity aids the impersonal treatment of people (Adams, 2000). It is interesting that a key part of the initiation process for the 2nd life system supports the users' understanding of the norms of behaviour for this environment.

Social norms should not be underestimated within any learning context and are a key part of the problems concerned with the multicast conferencing case-study and the flash-meeting case-study. There are social norms inhibiting our social behaviours; how we should and shouldn't eat (e.g. don't eat off the table, drink from a cup not a saucer), where and when we should sleep (Goffman, 1969; Giddens, 1984). These studies highlight that some people can feel inhibited by a perception that their behaviours are unintentionally breaching these norms and this can affect their ability to interact within a learning environment. Social norms, however, may also provide us with a link between affective learning issues such as trust, motivation, engagement, immersion and fun. As researchers and developers of technology enhanced learning environments we must seek to understand the enabling and inhibiting aspects of social norms within these contexts.

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