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Rules and tools: collaborating over networks for art and design students

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Abstract

As the popularity of the Internet grows, the roles it may play in different contexts and disciplines - e.g. archive/library of information, publicity tool or meeting place - become more apparent. The JISC-funded Enhanced Collaboration with Shared Tools for Art and Design Systems project is based at Ravensbourne College and it is studying the potential of the Internet for supporting collaborative work between students in art and design. This paper gives an overview of results from the first stage of Enhanced Collaboration with Shared Tools for Art and Design Systems. This has involved doing some initial research into the experiences of those who have already been involved in such projects and the 'lessons learnt' from them and these experiences. The resulting guidelines are discussed here. A survey of existing tools for collaborative working and an overview of some of these is also provided; the tools are described in terms of whether they support 'real-time' or asynchronous communication and the degree to which they afford communication of ideas visually.

Introduction

After a hesitant beginning, art and design staff and students have begun to gain access to the Internet as a matter of course. For an overview of the state of networking technologies in art and design institutions see Beardon (1997), while Worden (1996) looks at some uses made of them. ECSTASY[1] (Enhanced Collaboration with Shared Tools for Art and Design Systems) who two-year project is based at Ravensbourne College and funded under the JTAP[2] initiative to study the use of network-enabled collaborative tools in art and design education. This paper reports on the first stage of ECSTASY. The following section provides a brief overview of three collaborative projects we have studied, along with preliminary findings from a small-scale project ongoing at the time of writing. A number of key problems are discussed and possible solutions ('rules') identified. An introduction to some of the collaborative tools that are available is provided and some of their strengths and weaknesses; particularly for those used during the projects explored. The concluding section summarises the findings and the future tasks of ECSTASY.

The Projects

The following discussion is based on four projects: two involved Ravensbourne students and two did not. The DesignNet 2 project has been more fully documented elsewhere, and Scrivener et al's report (1996) and the DesignNet 2 Web site[3] should be consulted for more information. The Atomic project will be reported on in more detail upon completion.

Triangles (Autumn/Winter 1995/6)

This involved 1:1 pairs of (12 in all) graphic design students at Ravensbourne and (12) at the University of Texas at Austin. Some students dropped out as the project progressed. The brief was very open: to discuss issues of culture and collaborate on producing some visual output. E-mail was the only technology used - a Web site was proposed but too late in the project to be realised. The project remained at a 'communication stage' - no visual output was produced. Messages were exchanged infrequently and there was little real-time communication.

ERASMUS (Spring 1996)

This was a collaboration between furniture design students at London Guildhall and textiles students at UIAH in Helsinki. Around 5 students at each site actively participated in the project - some had dropped out earlier. Guildhall students used CAD to design sofas, the Finns used images of these to design

upholstery. E-mail and ftp were used. The final products which were images of upholstered sofas.

DesignNet 2 (Spring 1996)
This EU-funded initiative, co-ordinated by the Design Research Centre at Derby University, involved 9 European and North and South American colleges; links were point-to-point. Students (over 40 in all) were from applied arts, fashion, product and HTML design courses. Groups of 2 students at each site were paired with the same size group at the remote site. The brief was to "design a meal as a 'metaphor for getting together' communicating culturally and socially through their chosen setting." (Scrivener et al, 1996) E-mail, ftp, FirstClass[4] (a mail conferencing system that also includes 'live chat' and ftp), CU-SeeMe[5] (video/audio conferencing) were available though not all links used all tools. The levels of collaboration achieved and the satisfaction of the students involved varied e.g. the fashion students at Derby had a more positive experience than the applied arts students.

Atomic (Spring, 1997)
13 graphic design students at Ravensbourne and 30 at LCP are involved. They organised themselves into 5 groups at each institution which were paired with a group at the other site. E-mail including graphics attachments, a project mailing list, ftp and a Web site are being used. Groups were asked to discuss issues of identity and new media and come up with proposals for printed and electronic output. Initially, messages were sent from group accounts set up for the project rather than from individual accounts.

Students' participation in the collaborations was usually entirely voluntary. The only exception, at the London College of Printing, was where involvement was a compulsory part of an optional module. This was also the only site where the project was an assessed part of the students' course. Typically, students chose to become involved chiefly because they were interested in the Internet and partly out of curiosity. All projects were relatively long-term - running for over 12 weeks.

The Benefits

For all the projects there were some clear benefits and three of these appear to be common to all four.

- Students (and staff) typically acquired new skills as a result of the projects. Most obviously new IT skills were gained and existing skills were put to new uses. There were also reports of an increase in 'self-management' skills from one person and, encouragingly, another said that she felt far more comfortable about being in the computer room.
- Most students enjoyed the communication with the remote counterparts (though on-line hostilities did arise from time to time) and for some the exchange of ideas proved very fruitful.
- Students generally seemed convinced of the potential of using new technologies for collaborative working, even where their own experiences were less than ideal.

Problems and Possible Solutions

Preparation and Training
There is a great need for preparation before the project starts; many problems during the running of the projects described above could have been avoided. It is vital to sort out not only the brief, the students to be involved etc. but also issues such as:

- standardisation between sites regarding the technologies to be used. Problems have been encountered with a lack of matching technology - e.g. the Finns wanted to use desktop-videoconferencing but Guildhall could not provide access to this - and the use of incompatible file formats (e.g. for images).
- a strict timetable taking into account differences in term dates. This may seem obvious but in at least one project a site has had to drop out because of insufficient overlap in teaching time. For international collaborations, time zone differences may also mean that there is a very little opportunity for using synchronous technologies.
- flexible access to computers: this has been a problem in the past e.g. to allow students to check e-mail without booking ahead. As art and design institutions get more

networked machines this should become less severe. The ability to book is still necessary so that 'live' sessions can be arranged in advance.

For helping students to acquire the necessary technical skills, Scrivener at al recommend the following approach:

Stage 1 - students learn how to use production technology locally and individually ...;
Stage 2 - students learn how to use the collaborative technology locally;
Stage 3 - students work collaboratively locally;
Stage 4 - students work collaboratively internationally.

Clearly, for more complex technologies, e.g. desktop video conferencing this training will be vital, however, for the Triangles project learning to attach graphics files to e-mail messages early on would have been of great benefit.

Teaching and Technical Support
Things will go wrong during the projects and there should be technical support and alternatives to deal with this. For instance, the e-mail system at Guildhall failed during their work with Helsinki and telephone calls were necessary to inform the Finnish site. Also, even with ample training, not all the relevant information will be retained.

Support from tutors should be available before and during the project to help maintain enthusiasm and overcome difficulties in coming to clear goals. We have found that students often have difficulty moving from a 'communication stage' to a 'design stage', particularly where backgrounds are similar (e.g. 2 groups of graphics students), rather than complementary (e.g. furniture and textiles) when each site's role is more apparent. Formal critical reviews are particularly missed when these are not held.

Identity
A more abstract problem is that students often feel they have no idea who the remote counterpart is. This "lack of a sense of identity" for the virtual colleague has been reported by the students themselves and is also apparent from the lack of personal and contextual knowledge held about the others and from the lack of normal social constraints e.g. appointments made with virtual colleagues may not seem to have the same binding nature as face-to-face meetings. While the Atomic project exploits the ambiguity of on-line identity it is generally seen as an obstacle. (See Turkle, 1995 for an interesting discussion of "identity in the age of the Internet").

Strategies for overcoming such problems could include requiring students to make available introductory information e.g. short text biography, home page on the Web including photograph etc. Some technologies help more than others to foster a sense of presence and this will be discussed in the next section.

Motivation
Maintaining motivation is vital and can be tricky. The precursor to the DesignNet 2 project successfully used a 'carrot' approach - a face-to-face meeting and an exhibition of the work was arranged at Derby, and travel tickets booked (so the project's end could not be postponed). Alternatively, the fact that their involvement in the Atomic project is assessed, has helped to ensure commitment amongst the large LCP group and has also meant that the collaboration was guaranteed a share of limited teaching time.

Technologies
In this section some of the existing tools for network-enabled collaborative working are discussed. The different types of tool are discussed individually in terms of the degree to which they support synchronous/asynchronous communication according to how much visual communication the tools afford. Comparison with a report produced by another JTAP project (Lee et al, 1996) may also be of interest. It reflects the authors' aim to help those using on-line technologies for teaching in the humanities where there is far less concern with providing visual functionality.

The text-based nature of some of the most familiar and reliable, and least complicated and bandwidth-hungry technologies can be problematic. Without the ability to share visual ideas, many students said that they had little to spark initial discussions and the progress of the project was slowed considerably. In recent years, a natural progression from pure text to including graphics has been seen. Similarly, the new popularity of the Internet is leading to the development of graphical user interfaces to replace the obscure command syntax of many tools. The consequent increase in usability has been especially important for those involved in highly visual fields.

Text-Only Tools
E-Mail is one of most widely used tools. While its main function is to support asynchronous communication, it can also be used semi-synchronously (depending on the speed of the connection) if people are on-line at once. This has worked well during the Atomic project where a mailing list was used (i.e. where all postings to a single address get sent automatically to all the members) to allow almost real-time, as well as time-lapsed, group discussions. Many e-mail readers are only really suitable if a user has sole and permanent access to a particular machine - not generally the case with students - but increasing use of the IMAP protocol may resolve this problem (see Gray, 1995 for more information). The main complaints were that e-mail messages are too disposable and generic/impersonal in appearance to have much value. DesignNet also made use of a mail conferencing system, FirstClass i.e. where individual messages start or continue discussions or 'threads' and are arranged accordingly, (rather than all messages essentially being treated as a new thread as with ordinary e-mail). Most conferencing systems use client-server architecture and increasingly Web-based conferencing is possible, where Web browsers may be used as the client (see Woolley, 1997 for an excellent resource on this subject).

Synchronous text-based technologies are among the most popular (even addictive) on the Internet and have made the Internet's role as a 'meeting-place' apparent. Two of these include live chat e.g. IRC and text-based virtual worlds such as multi-user discussions (MUDs). Both afford a written equivalent of spoken conversations and no trace remains once text disappears from users' screens unless sessions are actively recorded. The essential difference between tools like IRC and MUDs is that virtual worlds also allow the creation of descriptions of artefacts, environments and 'avatars' (users' representations) that are stored. Chat was used by students during DesignNet2 and also by staff for administrative meetings, though problems occurred with trans-Atlantic connections. MUDs and similar worlds are generating much interest for their potential for teaching, e.g. the CoMentor JTAP project is building a Web-based MUD for teaching in the social sciences.

Visual Advances
As noted, even the ability to use e-mail attachments to include graphics files can be very useful, though experimentation is often necessary to ensure compatibility between software and sending large files is not advisable. A better solution is to use ftp to send and receive files efficiently. This is a (relatively) old technology but new clients like Anarchie make it more usable. The distinction between chat systems and virtual worlds is blurring, with chat clients such as The Palace[6] allowing the creation of graphical and customisable avatars, and themed 'rooms' where conversations are held. Much work is currently being done on fully-fledged virtual reality (VR) systems where 3-dimensional environments are simulated, and accessed 'immersively' or via some 2-dimensional display. Applications of these tend to employ metaphors - JTAP projects include virtual laboratories, virtual field courses and virtual design studios. We are also aware of a system used to support collaboration in clothing design[7]. The equipment needed to exploit VR is falling in price, thus becoming far more widely accessible.

Web Sites
The World Wide Web is very attractive to students - partly because of its visual nature, but also because expertise gained will be of benefit after the project - and many may

already have developed skills in creating Web pages/graphics etc. Although a large-scale Web site can be a major undertaking, for less ambitious uses software such as Microsoft's Personal Web Server[8] may be perfectly adequate. For DesignNet 2 a Web site was used to make the brief and other useful information available to students, as well as for exhibiting work. The Atomic project students are also setting up a shared Web 'gallery' space. Since several people may have the ability to update the site asynchronously, issues like version control become important.

Video Conferencing
One of the best technologies for generating a sense of identity between the partners is video conferencing. (See Coventry, 1995 for a good account of its advantages and disadvantages in teaching). The best sound and picture quality requires equipment whose cost is prohibitive for most art/design institutions although UKERNA supports a number of 'suites' that can be hired as needed[9]. More usually, desktop video conferencing systems are used. Until recently, the only choice for PC/Macintosh was CU-SeeMe (see Clark et al, 1995, on usability tests held at Derby, and Brown, 1996, for a critical technical review) but other options are now opening up. Related tools such as Cooltalk[10] implement whiteboarding where, instead of seeing the remote collaborator, sites share a drawing area that is used synchronously to display and annotate images, text etc. Discussion using audio and text speech is also supported. Phillips (1996) describes the use of whiteboarding software in a retail design company.

Conclusion

This paper has identified a number of key issues for running successful collaborations:
• the importance of preparation e.g. ensuring adequate training is given, standardisation of technology, setting up a strict timetable and getting students to produce introductory information about themselves
• provision of proper technical and tutorial support
• choice of appropriate technology, paying particular attention to enabling students to

exchange visual ideas and to get a feeling for who they are working with
• motivation and enthusiasm may flag - possible strategies for overcoming this are having an attractive reason for completing e.g. an exhibition, or making the collaboration an assessed part of the course.

Only a brief 'sketch' of the area and the tools available (most attention having been paid to those tools the authors have most experience with) has been possible here and readers should consult the ECSTASY Web site for more details. During the next stages of ECSTASY major collaborations will be set up and run learning from the results obtained and using the tools described. The experiences and the lessons learnt from these will be reported on in the future.

Notes

1 Enhanced **C**ollaboration with Shared Tools for Art and Design Systems. See also http://www.rave.ac.uk/ecstasy/

2 JISC Technology Applications Programme. See http://www.jtap.ac.uk/ for more information.

3 http://dougal.derby.ac.uk/designnet/

4 See the developer's Web site at http://www.softarc.com/ for more information.

5 See http://cu-seeme.cornell.edu/ for information about the shareware version and http://www.cuseeme.com/ for the commercial product.

6 See http://www.thepalace.com/

7 See http://www.crg.cs.nott.ac.uk/Virtuosi/ for more information about the Virtuosi project.

8 Optionally installs as part of Internet Explorer. See http://www.microsoft.com/ie/mac/features/pws.htm for details about the Mac version.

9 See http://www.tech.ukerna.ac.uk/ for information about UKERNA's video conferencing and other services.

10 Packaged with Netscape Navigator - see http://www.netscape.com/comprod/ products/navavigator/version_3.0/ communication/cooltalk/

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