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Adding Internet communication channels to a student support system
Mike Robertshaw
Associate Professor
THE OPEN UNIVERSITY OF HONG KONG

1. Introduction
The use of the Internet to enhance a teaching and learning environment is becoming one of the biggest growth areas in education. Many institutions are encouraging their staff to incorporate some form of Internet-based support into their courses. Some institutions are even created on the basis that all aspects of their educational system use this electronic medium.
In my presentation I will attempt to describe the different elements of the Internet available for use in education; in what aspects of student support these elements can be applied; and a number of issues associated with their use.
This paper is not concerned with the delivery of the core content of a course, although many support services relate directly to that content.

2. Internet communication channels
One of the major advantages of the Internet is that it isn’t a single medium. Through the Internet you can access a number of different means of communicating with individuals as well as small and large groups. While I am assuming that you are familiar with most of these communication channels it will help to first summarise the most common of them and their characteristics.

Email
This allows one person to send a message to one or many people. Messages are normally text-based, although the latest email packages allow users to send and receive Web pages within messages therefore allowing the use of colour, images, etc. An important feature is that the recipient does not have to be online when the message is sent. The message is stored in his/her email account until called for when the recipient next connects.
Most email packages allow for the storage of messages for later reference; include an address book to simplify the recall of email addresses and the creation of lists of addresses to be used through a single identifier; allow the filtering of messages into separate folders based on a match in any part of the header with a search phrase; automatically insert addresses for return messages; permit the user to sort on a variety of characteristics, e.g. sender; allow the user to thread messages on the same subject together.

Mailing lists
These are email-based and allow any subscriber to send a message to the list for automatic distribution to all other subscribers.

Newsgroups
The messages used in newsgroups are similar to email; however, when a subscriber sends a message to a particular newsgroup it is stored on the server. When any subscriber to the newsgroup contacts the server he/she has the option as to whether to download those messages that have been posted since the last visit. A key feature of most newsgroup software is the ability to thread.

Internet Relay Chat
Unlike the above channels chat is synchronous in that to participate in a chat session a user must be connected to the relevant server, i.e. communication is real-time. Whatever any user inputs into a chat session is shown immediately on the screens of all other subscribers.

Chat servers usually allow a user to logon with a false public name.
create their own chat room.
control who can come into a room.
control who stays.
The main form of communication is text, although some software now allow the incorporation of images.

Whiteboards
As an extension to chat there are packages available to enable a number of users to undertake live exchange of text and at the same time to share a common electronic whiteboard. Anything drawn on the whiteboard is repeated on the whiteboards shown on the screens of the other users.

Web-based discussion groups
Messages are stored on Web pages and are available to visitors through a central page of links. These discussion groups operate in a similar manner to newsgroups in that access to messages requires the user to access the page and select which messages to read. Such groups have an interface allowing for the threading of messages into layers to facilitate overviews; to enable new messages to be prepared and sent automatically formatted to the required structure.

Web
Multimedia pages can be prepared and placed for anyone to access. Hyperlinks allow the author to provide a variety of pathways through his/her collection of pages and through pages on other sites. As well as presenting information pages can be used to collect it from users.

Audio-visual
The technology to allow the communication of voice and live video over the Internet is now well established; however, bandwidth restrictions still restrict their use in education.

3. Types of support
The support to students studying a course can be broken into five basic categories:

Teaching
For example
the delivery of the content
response to student questions relating to content
provision of self-assessment
response to identifying an error in a student’s work

Learning
interpreting course content
testing understanding through self-assessment and formal assessment
interpreting feedback
reading beyond the content
revising

Counselling
development of study skills
course selection
general support
Peer
social exchange
self-help groups
Administrative
registration
institutional information
rules and regulations
surveys
4. The Internet - advantages and disadvantages
While the different Internet channels can be used to enhance all of these different types of support it is important to appreciate the costs of incorporating them in an educational system.
Advantages
Informality
The Internet culture is a relatively informal one. Public areas of the Internet are relatively relaxed; for example, in terms of how accurate spellings or grammar are. Users invariably avoid the use of formal titles and treat one another as equals. Instilling similar characteristics through example can help generate a freer environment for the exchange of views, etc. in an educational environment
Anonymity
Placed in a room with a content expert - the teacher - and a collection of peers many students feel very uncomfortable about actively participating - even when it's a one-one situation. They are often unwilling to expose their assumed ignorance or are simply nervous about speaking in public.
Many of the Internet communication channels allow the user to assume a fictitious identity which is then listed in any email or chat activity. Protected from personal exposure by such an identity many students are more willing to communicate and to contribute. Some users will create a fairly complex personality on the Internet which differs substantially from their real self even to the point of adopting a different sex!
Reactions by others to any communication through the Internet can be affected by the anonymous nature of identities. Physical characteristics can often play a role in attitudes and interpretation, but these are hidden on the Internet. For example, it is perfectly feasible for the teacher to assume a student identity for an Internet-based discussion in order to remove the dampening effect of a teacher's presence on exchanges, or to deliberately enter the kind of input that the teacher would like a student to provide.
Time and location independence
It is not necessary for individuals to be available at the same time or in the same place for communication to happen. Emails, newsgroup messages, Web pages can all be prepared and posted without having to make sure that the recipient is currently available to receive. While this applies to hardcopy mail the time scale involved in the Internet is so much more suited to a reasonable pace of communication.
In face-to-face scenarios there are often other time pressures, which do not encourage effective communication - the need to attend the next lecture or a meeting. Also the thought that inspires a question does not always come in
office hours and therefore being able to put the question immediately to the teacher through email ensures that it is not forgotten before the next meeting.

Preparation
When expressing yourself verbally there is usually little if any time to prepare what you are going to say. This can result in poor communication particularly in a student-teacher exchange when the student thoughts on an issue may not be easily expressed. However, given time to contemplate and to prepare a written question to email to the teacher the student is able to fine-tune his/her points. Similarly the teacher is able to take time considering what the student is saying in the message and in preparing a response.

Being able to prepare questions and comments is particularly useful where students are studying in a second language. Participating verbally is an additional challenge to such students especially where first language speakers are present.

Speed
Not only does the Internet provide an alternative to face-to-face communication but also to ‘snail’ mail. Where institutions rely in part on hardcopy being posted through the conventional postal system, then this automatically adds several days to any process. For example, the delivery and return of an assignment through the mail adds a delay to important feedback in distance education institutions; however, such delays disappear if assignments are sent attached to emails.

Accuracy
Where web pages are used it is easier for the author to ensure that information provided to students is kept free of errors and is current. Using hardcopy to communicate with students makes error correction difficult as you can never be totally confident that all students will have implemented any changes sent to them by the time that they are studying the material. However, with web pages it is possible to make alterations with immediate effect in the knowledge that all students will then have access to the corrected copy.

Printing
The use of the Internet to provide students with information during a course can result in considerable savings in postage and human resources.

Preparing for the work environment
Many companies are now using the Internet as part of their work environment either for internal communication or as part of their interaction with customers and business partners. Clearly, employers want their staff to be Internet-literate when they start and so incorporating the Internet into education helps prepare students for the work environment of the next century.

Disadvantages
Absence of visual information
A discussion between individuals on a face-to-face basis is always accompanied by a multitude of visual signals. Even on the telephone the tone of voice can change the context in which something said is interpreted.

Written communication, however, can easily be misinterpreted to cause offense. It is possible to improve interpretation by the use of emoticons , but the preparation of messages, etc. still requires a lot more effort to ensure clarity than when communicating the message verbally.

Skill acquisition
The use of the Internet is not an intuitive skill. Indeed different elements of this technology require different skills as they each have their own interface and characteristics. Introducing the use of the Internet into an education system means that the required skills have to be identified and the means by which students will acquire them provided. This adds an additional load to the learning process.

Domestic distractions
While it is attractive to allow students to undertake certain activities at home by the use of the Internet rather than in a classroom it does present new problems for the student. A classroom environment imposes on study a certain discipline and guarantees a minimum of distractions. At home other family members will be nearby and, even with the best declared intentions, it is difficult for them to avoid distracting the student.

Permanence of record
Some students are reluctant to participate in expressing themselves electronically because their contributions have a sense of permanence and so could be used against them later. Expressing a point of view through text means that there is a record of that view. Saying the same thing verbally poses less of a threat.

Man-machine effect
Put a person behind the wheel of a car and some people adopt a different personality. The meek become aggressive thanks to the presence of a machine interface with the rest of the world. This effect is also seen on the Internet. Protected by the anonymity offered by the Internet people can become more aggressive than they would in a face-to-face environment. Flame wars on the Internet are unfortunately far too common and often arise with the minimum provocation.

Surfing addiction
For many the Internet is an addiction difficult to ignore. Emails have a sense of immediacy which encourages the user to read them and to then respond at once. Without some discipline students can soon find themselves swamped by email as students abuse a course mailing list, for example. Students can feel that each message must be read even if only to check that it doesn’t contain important information. Web pages nearly always have one more link to another page, which has a link to another page and so on. In the end the student may be distracted from the original purpose of using the Internet or may use the Internet to study a topic in greater depth or width than allowed for in the study timetable.

Student expectations
In the knowledge that emails arrive quickly and that the teacher will read it students can become overly optimistic about how quickly the teacher can respond and how many messages he/she can handle daily. If email communication is seen as an effective medium for contact with the teacher, there is a danger that the teacher could be swamped with messages from students who expect an instant response.

5. Issues
The above disadvantages themselves generate issues to be addressed by academics before introducing the Internet into their teaching, but there are more general issues that need to be considered at the institutional level.

Appropriate use of technology
As with any new technology it is tempting simply to introduce it because it exists and is seen as 'sexy'. Many institutions are now making the use of the Internet for that reason alone. Faced by competition through the Internet and encouraged by the expectations of students that the latest technology will be used academics are rushing into putting everything on the Internet. Lecture notes/course material are converted directly into HTML and thrown at the Web in the belief that this improves the teaching and learning process.

It is essential that changes to an educational environment result in a real improvement for the student. Therefore, it is important that the special characteristics of a technology are identified and matched with the educational needs of students. The technology must be chosen because it is the best one available to meet a particular set of needs.

Students differ

It is wrong to assume that one technology provides the single solution to all students. Some students respond better to a face-to-face environment; some prefer telephone contact; some thrive in a virtual world. Not everyone is comfortable with computer-based technologies. Therefore, opting for an environment based solely on the Internet is likely to be to the detriment of a proportion of the student body. Of course, resources may not permit a number of different support systems, but teachers must take account of the diversity of the student body.

Staff

The use of the Internet in many institutions is often centred around a small group of enthusiasts who have acquired appropriate skills without institutional support. If the technology is to be extended over all courses then the remaining staff will first of all have to be convinced that this is a good thing both for them and for their students. Staff will then require training in the necessary skills. In many cases it will be necessary to introduce a specialist support unit within the institution to undertake certain tasks for academic staff, such as Website preparation.

Code of conduct

It would be nice to believe that everyone using the Internet will behave like responsible citizens of cyberspace; however, as mentioned above aggressive behaviour is unfortunately all too common. Institutions need to consider providing a set of guidelines for Internet communication by students and staff and how to police it.

Workload

It is a fallacy that computers and software reduce costs. The use of the Internet to enhance communication in support services can work but it must be remembered that electronic communication requires much more effort that simply saying it. Adding the Internet to a course means more work for the student and more for the staff. Managers and teachers have to allow for this extra load.

For students it is essential that they see that the benefits of developing new skills easily outweigh both the financial and time costs. In particular they should be confident that the skills learned for one course can be transferred to other courses.

Security

The use of the Internet as opposed to an institutional intranet raises concerns about security. Firstly, the associated institutional infrastructure is linked to the world inhabited by hackers. Secondly, students are exposed to a world
where unsuitable material is easily available and undesirable individuals have taken advantage of easy access to unprepared children. Schools, in particular, need to consider how to protect children from these elements.

**Integrating the Internet into an educational system**

Experience at my own institution has shown that simply adding one or more Internet communication channels to an existing support structure does not work. The extra work involved for students brings insufficient immediate benefits for them. Where the Internet has been incorporated into a course because it meets a need, then students do seem to appreciate that and make use of it. Therefore it is essential that the academic views the use of the Internet within the entire support structure for a course.

It is particularly important that an institution takes a holistic approach to the incorporation of the Internet. Software interfaces must be standardised across courses to ensure the transferability of user skills. Quality control systems must be adapted to allow for the new media. Administrative and technical support structures must be provided to allow the academics to concentrate on the educational aspects of the technology. The institution needs to have a fully declared policy on the use of the Internet to inform students and staff as to the extent of its.

6. Examples

**Teaching**

In an environment involving large numbers email promotes individual attention. Encouraging students to email requests for clarification ensures an avenue by which even timid students can obtain personal attention. Individual groups of students, for example established for project work, can be addressed through a single email to feed them information without worrying about the mechanics of arranging any other form of distribution. Discussions can be organised through mailing lists, newsgroups or chat rooms including tutorials. Threading allows students to build up a connected history of the discussion over time.

The latest developments in a subject can be presented either through an internally prepared Web page or simply through a link to a page elsewhere.

**Learning**

Where content exists in Web form alternative structures for moving through the content can be imposed through pages of hyperlinks. Therefore a different structure can be applied for students preparing assignments, referring back from later units and for revising for an exam. Students have access to a wealth of information from the Internet. For example, a search engine can provide access to a wide range of alternative sources.

Newsgroups and mailing lists provide access to hundreds of individuals willing to provide free help. Self-assessment questions can be provided with answers linked to course content. Text searches allows for the rapid location of the relevant part of a document.

**Counselling**

Teachers can provide regular reminders by email of what the student should be doing at any point of time. Web pages providing summarised study advice can be published for quick reference.
Web-based forms can be used to gather the correct type of information for counselling.

Peer
Virtual environments through newsgroups or chat can be provided where students can meet socially.
A help newsgroup allows all students to learn from the problems raised by one of them.
Self-help groups can meet in chat rooms.

Administration
Online registration further reduces the time and space limitation imposed on study as well as the workload of administrative staff.
Encouraging the use of email for requesting help from administrators reduces the pressure on staff to provide immediate answers.
Important information can easily be distributed without concerns about cost.

6. Further reading

Hardcopy
The Educator's Guide to the Internet
Virginia Space Grant Consortium
A book written principally for school teachers in the USA. It covers most aspects of the Net with many guides as to how to incorporate it into teaching. The emphasis is on activity and so some of the background information is light. Good for familiarising yourself with the basics and jargon although the USA-emphasis could be a little frustrating.

Web-Based Instruction
Badrul H Khan
"The purpose of this book is to provide readers with information related to design, development, delivery, management, and evaluation aspects of WBI. This book is divided into five main sections, including: introduction to Web-based instruction; Web-based learning environments and critical issues; designing Web-based instruction; delivering Web-based instruction, and case studies of Web-based courses."

Web-Teaching
David W Brooks
This is a guide to designing interactive teaching for the Web.

Web Based Instruction Resources
John H. Curry
HYPERLINK http://english.usu.edu/jcurry/wbi.html
HYPERLINK http://english.usu.edu/jcurry/wbi.html
Good collection of links

An Investigation into Instruction Available on the World Wide Web
Robert Parson
HYPERLINK http://www.oise.on.ca/~rparson/out1d.htm
HYPERLINK http://www.oise.on.ca/~rparson/out1d.htm
Master's thesis although the site may be closed soon.

The Faculty Connection
http://www.facultyconnection.org/
"This website is designed to assist faculty of post-secondary institutions to become familiar with issues, examples and discussion topics associated with using emerging technologies in teaching and learning. Using this educational resource, faculty are encouraged to travel the web at a comfortable pace to
identify where courses are offered over the Internet, how technology can be used in the classroom, and to discuss issues that will affect them in the future."

The Web of Asynchronous Learning Networks

http://www.aln.org/alnweb/index.htm

This site contains masses of information about teaching through the WWW. Complete with magazine and journal plus lots more. Good site if somewhat USA-centric.

World Lecture Hall

http://www.utexas.edu/world/lecture/

Contains links to pages created by faculty worldwide who are using the Web to deliver class materials. For example, you will find course syllabi, assignments, lecture notes, exams, class calendars, multimedia textbooks, etc.