

Retaining Human Contact in Web Based Education: Implementing a Model

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INTRODUCTION

The education sector is embracing the Web as an instructional medium. Providers of distance education courses see the Web as offering a flexible delivery method. Course providers, faced with shrinking local markets, look to expanding international markets, and see the Web as a means for delivering courses partially or wholly off shore and, consequently, as a means of alleviating locally shrinking markets.

Developers and sellers of Web technologies are, likewise, keen to exploit the educational market. They see the financial benefits from their technologies being used in the delivery of courses, for upcoming generations of students to be comfortable with, and so inclined to purchase, their technologies on entering the workforce.

These financial and technological forces are influencing the way that Web based education is developing. The financial forces see the Web as a means of reaching potentially large numbers of students without a commensurate increase in staffing costs. The educational model behind such thinking sees the Web as an electronic book: simply put the subject material on the Web and students can learn from it. The technology developers tend to propose methods of learning which are determined, to a significant degree, by the capabilities and limitations of their particular technologies.

While financial imperatives and technologically driven initiatives are a necessary component of the new flexible delivery mix, they do not represent the whole recipe. In the end, educational imperatives will have a large say as to whether or not Web based education succeeds or fails. If only a limited proportion of students are able to learn easily and successfully from the Web in its electronic book model of learning, for example, then the market will remain commensurately small. The aim of Web based education must surely be to develop a model which will enable a relatively large proportion of the student population to learn relatively easily and successfully.

COMMON ELEMENTS OF MODELS OF LEARNING

All over the world, in all cultures, successful learning takes place. We could say that, as a species, we humans are quite successful at teaching one other. Education takes place in a wide variety of settings: some of which are well stocked with educational paraphernalia, while others have few learning materials.

Many learning theories and models have been proposed: models based on human biology, psychology, sociology and educational theory. The role of the teacher is significant in many, if not all, of these models. We speak of one who teaches and one who learns. Teaching and learning is seen as a human to human interaction. Of course we can learn without a specific person who is the teacher: we can learn from our own observation of the environment around us, for example. However, much human learning, both structured and informal, takes place in this context of the passing of knowledge from one human to another.

Some very general characteristics of this person to person teaching/learning process can be noted:

- There is some person to person contact between one who teaches and one who learns. The role of the teacher generally includes the assembling and presentation of some information. The teacher is often the manager of the learning process: directing students' activities. The teacher will often act as a social agent: motivating the students, for example.
- Spoken language plays a significant part in the process: both the actual aural words together with the accompanying body language and the general context of the situation, all of which influence the meaning attached to verbal communication.
- Written language is used extensively. Language includes the written word, images (still or moving) and symbols.

With these elements we pass on information, develop understandings and engender attitudes in students. This simple model contains elements of:

- a teacher who directs or influences students in what they will do as part of the learning process,
- a teacher who communicates material in face to face interaction through speech and a variety of media, including text and images.

This model is, of course, very simple and ignores much of the detail contained in various, more specific, models. However, even such a simple model is a useful tool when examining the various Web based educational models that have come into use. If, for example, a significant proportion of the learning population has come to expect that normal learning usually involves the elements of this simple model (such as person to person interaction), then a Web based model that omits these elements to a significant extent may appear unsatisfactory to these learners.

SOME CURRENT WEB BASED LEARNING MODELS

A look at various educational Web sites shows that some categories of sites can be formed, according to the functions performed by the sites, and their underlying learning models. This paper identifies three such models and then proposes a fourth.

Web model: the Web as Source of Information

Perhaps the simplest use of the Web has been as a convenient place to store supporting information for traditionally offered courses. A typical university course, for example, supplies students with various resources: printed lecture notes, assignment specifications, practice exams, and the like, which have been previously distributed in print form. Students may also use the Web to access sites for information required for assignments or projects. Certainly, the Web is very good in the role of information source. It is a welcome adjunct to the teacher as source of information. This model uses the Web only as a part of the learning process: students still encounter a real live teacher in an interactive environment.

Web model: the Web as Electronic Book

A number of institutions have moved to use the Web to present information in a more structured way. In this case, the structured presentation of information becomes the teaching process. Students follow screen instructions to read material, activate multimedia demonstrations, take self-correcting quizzes or other activities. The course material often consists largely of factual information, which is to be learned from the Web page and any accompanying media. There is no interaction between teacher and the students through the Web.

Web model: the Web as Teacher

Some Web based courses have moved past the previous model to include some form of personal communication between students and teacher and between students and other students. Typically these courses use email, newsgroups and perhaps chat rooms to implement this personal contact.

Web model: the Web as a Communication Medium Between Teacher and Students

This paper proposes a fourth model which views the Web as a communication medium between teacher and students. Essentially, students learn from the teacher: but "through" the Web and not "from" the Web. Under this model, the Web still may present structured information, but it also provides the communication medium for the necessary human interaction, and it is this interaction that is the prime focus of the teaching/learning process, not the structured information contained on the site.

Face to face learning environments employ a variety of learning strategies and models. Web based education will be limited to those strategies and models which can survive with the limited interaction available through Web technologies. It should be acknowledged at the outset that, while the Web is adept at delivering vast amounts of information to the student, it is not a very good medium for inter-personal communication and relationships, when compared with face to face interaction. However, "it is better to light a candle than curse the darkness". In designing Web based environments we should look for those face to face strategies which can be ported successfully to the Web.

It can be helpful to consider the types of Web based communication technologies that are available, and can be incorporated into an implementation of a learning environment built according to this fourth model. Table 1 provides a taxonomy of such technologies. This taxonomy categorises these technologies according to whether they are synchronous or asynchronous; visual, auditory or text based; and whether they operate in a one to one, or one to many interaction. Since much of human interaction is visual and synchronous, it is with technologies in this area that we need to give special attention when implementing this fourth model.

	One To One Interaction	One To Many Interaction
<u>Synchronous</u>		
• Visual	• Microsoft NetMeeting for those few students with a video camera	• Real time streaming video from teacher to students, (Real Video system) with textual chat from students to teacher.
• Auditory	• Netscape Conference	• Real time streaming audio from teacher to students, (Real Audio system) with textual chat from students to teacher.
• Textual	• One to one chat using Mirabilis ICQ system	• Chat room
<u>Asynchronous</u>		
• Visual	• Stored video from teacher, (Real Video system) with email from student.	• Stored video from teacher, (Real Video system) with email from students.
• Auditory	• Stored audio from teacher, (Real Audio system) with email from student.	• Stored audio from teacher, (Real Audio system) with email from student.
• Textual	• Personal email	• Newsgroups or email mailing list

Table 1

There may well be areas of learning for which the Web is unsuited as a medium, simply because it cannot support the level of human interaction required for successful learning. An example of such an area might be the teaching of professional acting, where student and teacher may well need to be physically present to one another. Other learning models, which, for example, may only require the explanation of some material by a teacher with an opportunity for students to ask questions, can be ported successfully to the Web.

As noted previously, this Web model needs to provide a learning environment through which a student can encounter a real person, through which the student will be able to establish some form of human relationship with that person, which, in turn, can form a basis for learning from that person. The degree to which learners

require any form of encounter with a teacher will vary from none at all to a level that is critical for learning. Some learners have developed independent learning strategies, which may require little or no interaction with a teacher. Other learners require the motivation and structuring of learning that a teacher can provide. Typically, younger students seem to depend more on a teacher than do older students.

Since it is not possible to determine every individual's required level of interaction, the learning process can but implement an environment incorporating opportunities for such interaction for those students who wish to use it. While the Web environment can provide the facilities for interaction to take place, it cannot cause that interaction to actually take place: that will depend on all the human factors that determine human interaction.

A model such as this aims to mirror face to face learning, as far as is possible. Of course, this face to face model is not the only method of learning, and is not necessarily the best in all circumstances. However, it is a model that is widely used and one with which a good proportion of the student population would be familiar.

IMPLEMENTATION

An attempt has been made to implement a Web site incorporating all four models, with particular emphasis on the last. The URL of the site is: <http://neptune.fcit.monash.edu.au/cfr1150/> and entry to the site can be gained with the username "human" and password "contact". The site, developed by the author, teaches a first year undergraduate subject on the design and implementation of Web based material. The subject has no pre-requisites and is taken by non-computing as well as computing students. It is offered over the summer semester, as well as in normal semesters, and has been taken by students from all Monash campuses. Students can take the subject by attendance at on-campus classes, home study using the Web site, or a combination of both. Most students have used a combination of class attendance and home study. In the coming summer semester the subject will be offered as a full distance education subject.

The web site fulfils the first three of the Web models previously discussed. The site uses text, graphics, pre-recorded audio and video clips and hyperlinks in its electronic book role. Asynchronous two way interaction is provided through a dedicated newsgroup and email.

Additionally, the site addresses the fourth model by implementing synchronous two way interaction by dedicated chat facilities. Additionally, Web based live audio and video broadcasts are used for lectures and personal contact. Students can see and hear the lecturer explaining the subject material, in real time. Students can ask questions, again in real time, through text based chat window. The lecturer can then answer such questions through the video and audio broadcast link. This two way process can be used for the traditional style of lecture, or for less formal question and answer sessions.

Figure 1 shows a typical lecture screen, implementing the two way communication. The main site navigation menu is positioned down the left hand side. Options from this menu take students to various sections for administrative functions (e.g. assignment results); information on assignments, timetables, announcements, references, subject handbook and the like; use email or newsgroups; and move to the actual subject material and related exercises, grouped into topics and sub-topics.

Across the bottom of the typical topic screen, shown in Figure 1, are navigation buttons to move between sections of the material, to go to related exercises or hyperlinks, or to play pre-recorded audio or video material. The material being taught is presented in the two central scrollable windows (in this instance the material concerns the use of image maps in HTML documents).

In the top left hand corner there is a floating window through which students can see and hear their lecturer explaining the material (i.e. giving a lecture) in real time. In the top right hand corner of the screen there is another floating window through which the student can ask questions, or make comments, using text entry. All participating students can see all questions or comments as they are entered. The lecturer can respond in real time through the video window. The mechanism is used to facilitate the human interaction critical to this model. Since most students can purchase an inexpensive microphone for their computers, further interaction can be implemented by live voice chat using Netscape Conference (which comes as part of the Netscape browser). This technology is used mainly for more informal one to one interaction.

Of course these interactive mechanisms do not equate to full person to person contact. But given limitations of the Web medium, they do provide a significant improvement for the learning environment than that afforded by the electronic book model.

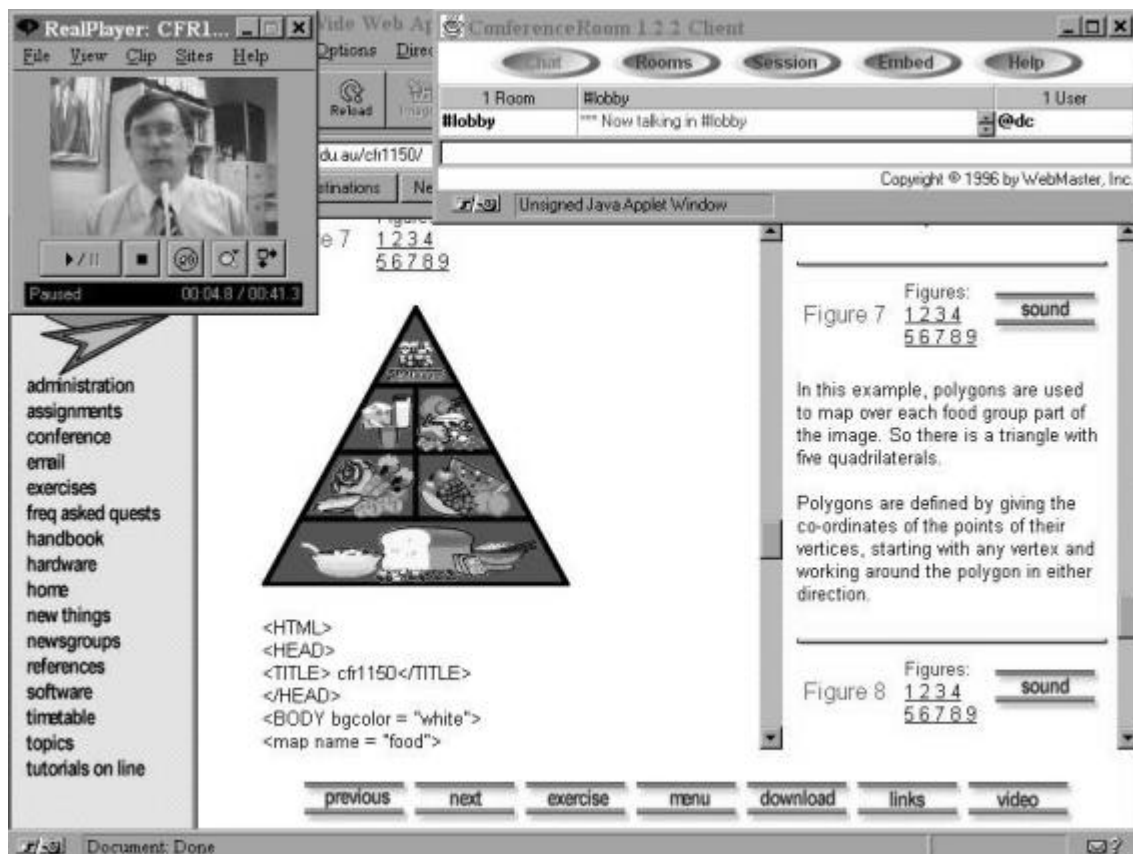


Figure 1

One of the advantages often quoted for distance education study, is that students are not restricted to aligning their lives to real time lectures: they can study when they wish. The implementation of this subject allows for this, in that the broadcast lectures and discussions are recorded as they are broadcast. Students can view them live, or at any subsequent time, as they wish.

It can be noted that in all video and audio materials, both pre-recorded and live, the actual subject lecturer is featured. Some multi-media materials produced for distance education use professional or semi-professional actors in the interest of a better quality of production. In this instance, real contact with a real person is being implemented. Consequently, maximum opportunity to see and hear the actual lecturer is of prime importance, rather than the polish of the performance, although one would hope the lecturer would be able to communicate satisfactorily.

CONCLUSION

Web page developers are quick to point out the high costs of developing Web based materials. Professionally prepared pages often require input from technical people, content developers, graphic designers and code cutters. Educators are also confronted with these high development costs, often in this instance, expressed as the considerable amounts of time needed to prepare Web based materials for their students. Attempting to place on the Web everything that would be said in a semester's series of lectures, is tantamount to writing a book. Consequently, the

electronic book model quickly becomes impracticable. The Web as communication medium model (with supporting material), on the other hand, is viable. The information that would be passed on verbally is still passed on verbally: no attempt is being made to write it all down. The supporting material that accompanies the real time video or audio presentations could be as little as the traditional PowerPoint slides, or it could be a text book, or possibly more extensive Web based material which takes advantage of the multi-media capabilities of the Web. However, the critical point is that the learning focus is not on the supporting material, but on the person to person communication.

Students will need to adjust to this Web based learning model. However the degree of adjustment required for this model would appear to be less than that required to adjust to a model where the central element of the teacher has been largely removed.

Those who see the Web as a means of cheap mass education will be disappointed with this "Web as communication medium" model. On-going staffing costs will not decrease, and will probably increase, as staff will need to work around the limitations of the medium to establish and maintain viable teacher-student relationships. Given the integral role played by human interaction in the learning process, course providers should aim to provide such interaction as educational best-practice. If students start looking for a learning environment with which they are comfortable and familiar, before parting with their credit card numbers, then market forces, if not educational best practice, might induce course providers to include significant person to person contact in their course offerings.