# Ongoing Professional Development through Distributed Hypermedia

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**Abstract**

This paper describes the development of a World Wide Web (WWW) presence and the issues and challenges confronted when creating the print and standalone disk versions in addition to the networked (online) WWW application.

When developing the electronic versions (standalone and networked WWW applications) of the print materials the following issues needed to be addressed;

1. size, resolution and colour depth of images;
2. efficient conversion of print version (Macintosh Word format) to WWW version (HTML format);
3. hypertext navigation and linkages;
4. Standalone Disk Version - Macintosh, Windows, DOS; and
5. limitations of standalone versus networked WWW applications.

The paper will discuss issues raised in the management of a project for the Open Learning Technology Corporation Limited in which the final product was placed on the World Wide Web. This project was the first in a planned roll-out of products to assist Australian teachers, the largest professional group in Australia, in their ongoing professional development needs.

The comprehensive evaluation of the prototype version which allowed for end-user feedback to be incorporated into the final product, is described and discussed.

**Keywords**

*project and people management, distributed hypermedia, open learning, professional development, evaluation*

## 1. Introduction

This paper reports on the issues arising from a project involving the production of distributed hypermedia. The main product was an information kit 'Changes in the Learning Environment', available in print, stand-alone disk and through the World Wide Web. Interactive elements in the Web version include keyword searching, feedback form and hyperlinks placed to enable access to other appropriate Web sites. There are five components to the information kit. They are: Ongoing Professional Development, Working Smarter, Multi-dimensional Classrooms, Future Learning Environments and Invited Contributions.

The project 'Open Learning, Communication Technologies and Teachers' Professional Development' aimed to generate products defining open learning in terms of an open learning framework and

demonstrate the capacity of information and communication technologies to enhance professional development and teaching practice.

## 2. The Project

There are approximately 220 000 teachers in Australia constituting the largest professional organisation in Australia. With the many changes in society, in information and communications technologies, and with the emphasis on lifelong learning, the need for ongoing professional development opportunities is immense.

The themes emphasised in the information kit include:

- changing work patterns for the teacher;
- changing mindset to view the teacher as guide and mentor rather than the 'fountain of all knowledge';
- empowering the learner (whether the learner is the teacher or a student in the school);
- changing classroom structures and the technology available to enhance the learning process; and
- encouraging teachers to explore educational computing and to integrate the use of computers and allied technology into their teaching practice.

It must be emphasised that the target audience (within the teaching profession) for this kit, is not the Information Technology Co-ordinator or the Computing teacher, but the many teachers who are ready to take the first step towards using information and communications technologies, as the infrastructure becomes more widely available, yet are uncertain how to.

## 3. Project Management

Longworth (1995) states that project management 'represents the means, techniques and concepts used to run a project and achieve its objectives'. Project management involves managing the cost, effort, priority and timing of project deliverables, tracking the process of change, planning ahead, managing risk, scheduling equipment and technology, helping people to perform their best and maximising their rewards (Thomsett, 1992). The management of this project included planning the tasks in a logical and results-orientated way, managing changes and uncertainties experienced in this project, leading people effectively and concentrating on exceptional events rather than being distracted by routine problems.

The content was developed in collaboration with teachers, employers and providers. There was a conscious effort to present the printed kit in a way that encouraged the teacher to access the kit online. It was necessary to consider that what was essential or desirable for one medium was not necessarily possible or desirable for the other medium. An important question that arose out of the project was how best to allocate funds during the project; given that the Web presence can be considered a dynamic, growing document (depending on what additional functions are built into the Web presence). It was necessary to allocate a certain proportion of project funding to resource the ongoing maintenance of the kit on the Web.

Canale and Wills (1995) have called for wider communication between practitioners on providing the most effective support for developers of distributed hypermedia projects. They reported, that for the Managing Continuous Improvement (MCI) project, 14% of funded contributions should have been

allocated for project management. However, in this case, an industry reference group was set up to provide advice in a voluntary manner and, if their time had been costed into the project, 16% of the budget would have been used in project management.

With respect to funding bodies such as the DEET's Committee for Advancement of University Teaching (CAUT), it is most important that a component is built in for project management, especially where the project team is a consortia of universities separated geographically. Even if not officially recognised someone must assume the role and responsibility of project manager. It is important that this role 'come out of the closet' and be recognised as an integral part of the production of distributed hypermedia with direct consequences on the quality of the final product.

Five external consultants were involved with this project. The degree of advice offered, and their input, changed throughout the different stages of the project.

## 4. Media Production Issues

The unique nature of this product lies in the fact that it was planned to disseminate the kit using three media - print, disk and online. This created the opportunity to reflect on issues arising during the project. Initially it was thought each medium should be treated equitably. However, this would result in the potential of some media not being fully utilised. It was decided that, within limits, there would be as much similarity as possible but the unique characteristics and potential of each medium would be considered.

What follows is a discussion on the issues confronted.

### *4.1 Size, Resolution and Colour Depth of Images*

Vector-based graphic files were used in the print version, however, these needed to be converted to bitmapped graphic files with a size, resolution and colour depth appropriate for the minimum end-user configuration of 640 x 480 pixels x 256 colours. There were some problems during this process as the graphic design company contracted to produce the print-based graphics was very experienced in this medium but not so with conversion to various graphic files (eg gif, jpg) using screen resolutions. Also vector-based images, such as the OLTC logo, have a number of closed loops which resulted in incomplete rasterisation. The solution was to scan the original OLTC logo at the desired resolution and colour depth.

It became clear during the development process that the electronic versions should include a number of good quality images (256 colours) to 'break up' the large amounts of text. The use of images in the print version had been considered but discarded because of the cost-prohibitive nature of this form. Thus this has became one of the distinguishing features between the print and electronic versions of the information kit.

### *4.2 Efficient Conversion of Print Version (Macintosh MSWord 6.0) to the Hypertext Markup Language (HTML format)*

This was a two-step process. The first step involved the actual conversion from MSWord format to HTML. A number of software tools were used to complete this conversion process. Development of the electronic versions took place in a Windows PC environment, which meant that the Internet Assistant add-on for Windows MSWord 6.0 could be used for the initial conversion of HTML. However, limited use of style formatting in the MSWord files resulted in approximately 80% conversion, with the final editing undertaken in a custom HTML editor called *HotDog* (http://www.sausage.com). This editor supports many of the features (e.g., tables, centre tag,

background image, etc) in the HTML 3.0 specification, whereas the Internet Assistant add-on only supports the HTML 2.0 specification.

The second step in the conversion process involved the creation of a number of 'screen pages' and hypertext table of contents from the single linear HTML file that was created using the process just described.

*4.3 Hypertext Navigation and Linkages*

With slightly different implementations for the standalone and networked versions, navigation from the home page to the five components was icon-based. Non-linear navigation within each section was achieved by choosing topics from the hyperlinked table of contents, although linear progression through a section was catered for by the use of navigation buttons at the top and bottom of each 'screen page'.

The prototype electronic version was disk-based only, hence there were no hyperlinks to external online resources. These will, of course, be implemented in the online version and their representation is indicated in both the print version and the standalone electronic version so that teachers are aware of the availability of further online resources.

*4.4 Standalone Disk Version - Macintosh, Windows, DOS*

During the prototype phase it was considered necessary to trial the standalone disk version of the information kit on as many computing platforms as possible. In practical terms this meant providing Web browsers able to operate in standalone mode, and the data files for the Macintosh, Windows and DOS environments.

Catering for the Macintosh environment was relatively straightforward. Both the Netscape browser and the data files were able to be delivered on one high-density disk. The installation procedure involved the following:

1. Creation of a new folder on the hard disk.

2. Copying of contents of floppy disk to his new folder.

3. There are two self extracting archives ('Netscape1.1sea' and 'OLTC Data files.sea') and one file called 'index.html'. Double-clicking on each archive extracted its contents. If Netscape was already installed on the computer then only the OLTC Data archive needed to be expanded.

4. The two self-extracting archives could then be dragged to the Trash and deleted from the hard disk.

5. To run the program it was simply a matter of dragging the file 'index.html' onto the Netscape icon.

Creating an automated setup program that catered for either DOS or Windows environment was much more difficult. A custom setup program was written that installed a program called DOSLynx if the teacher wanted to use a DOS-based Web browser or installed Netscape if a Windows-based browser was preferred.

DOSLynx was able to run on a minimally configured PC (something that may be present in schools) with the document being loaded in character mode, with inline gif graphics able to be viewed by

selecting the image and the program changing to graphics mode. DOSLynx could be configured to run without a packet driver for disk-based standalone use.

The Windows installation installed the Netscape 1.1N Web browser, which normally is 1.5Mb compressed therefore this needed to be divided over two disks. Also, since the program is running as a standalone application (i.e., not accessing the TCP / IP network) then a dummy Winsock Dynamic Link Library (DLL) needed to be installed. This is available on the Netscape ftp site (ftp.mcom.com) as unsupported software called mozock.dll. This had to be renamed winsock.dll and placed in the windows directory on the user's hard disk being careful not to overwrite any winsock.dll that was already present in this directory. Once the compressed files and data files were copied to the hard disk via the install program, the user then needed to run the Netscape setup program from within Windows. Once Netscape was installed, the file index.htm was automatically loaded if the default installation directory path had not been changed. Otherwise the teacher had to use File-File-Open in Netscape to browse the hard disk file structure to load the file index.htm.

The HTML files are set up to load *.html but the last letter is ignored in MS-DOS as it only accepts file names with a three character extension. This can be used to advantage to write the HTML files with the usual *.html filename which can be read by Macintosh and Unix operating systems.

Relative URL's were used to ensure ease of movement of HTML files from one platform / machine to another.

Preliminary review of the standalone disk version indicates that very few teachers chose to install the information kit in the DOS environment. Given the complexity involved in providing an automated installation procedure to cater for the DOS-Windows environments, only the Macintosh and Windows environments were supported in the release version of the information kit. The purpose of the print and standalone versions was not only to inform teachers but also to enthuse them and hopefully encourage many to access the kit online. The DOSLynx environment was quite limited and certainly did not contribute to the latter objective.

*4.5 Limitations of Standalone versus Networked WWW Applications*

The potentially interactive capabilities of the WWW application are not easily retained in the standalone version simply because there is no access to the Web server for interpretation of browser requests. Functions, such as fill-in feedback forms, keyword searching, use of mailto: URL for email and clickable image maps, were not available in the standalone version.

In this release of the electronic version of the information kit a "pseudo" clickable navigation map was used by closely aligning the five small icons representing the five sections and making each a hyperlink with a BORDER = 0 argument.

Interestingly, the availability of client-side image maps is imminent with the release of the Microsoft Internet Explorer for Windows 95. With client-side image maps, all the map information is contained within the HTML file. A browser, such as Internet Explorer, processes the image map directly rather than sending processing requests to the server.

This has a number of advantages:

- performance - server requests are eliminated thus increasing the speed with which links are resolved by the client.

- usability - because the browser processes the map directly all links can be shown as the user's cursor passes over the map.

- image maps can be created and tested locally, without requiring a server.

More information on image maps is available in a paper *An HTML Extension to Support Client-Side Image* Maps (http://www.spyglass.com/six/developers_techdoc4.html), by James Seidman of Spyglass Inc.

## 5. Evaluation of Prototype Kit

### *5.1 The Percentage Return, the Sample, and the Target Group*

The evaluation of the prototype kit comprised a written questionnaire, telephone interviews and a face-to-face forum.

The final percentage return for the written questionnaire was about 60%. Some evaluation participants could not respond to the detailed questions because of disk problems. Also, the returns from some states and territories were affected by school holidays, which are not synchronised nationally.

There was a great difference in response between those teachers already using information and communication technologies and those teachers not currently using them. One comment from the later teacher said: *As a non-computer operator, I found the kit to be very interesting and motivating ... it has enough detail to be a valuable Professional Development exercise.*

### *5.2 Whether the Information Kit Achieved Its Aims*

The level of success in doing this was calculated as being greater than 80% regarding the following aims:

- encouraged the teacher to think about open learning and professional development;
- drew attention to the potential of information technology in professional development; and
- stimulated thinking about future learning environments.

However, the aim of ‘providing current examples about what works for teachers in different situations’ rated a response of 57%.

### *5.3 How the Information Kit could be Improved*

There was a strong call for more examples of what works best for teachers.

Two avenues were explored to enable teachers to share their successes (and failures). The invited contribution section of the Web document will be a dynamic document as additional short papers are placed on the Web. In addition, an electronic discussion forum that can be accessed by text based mail systems, as well as Web browsers, will be implemented to facilitate the informal exchanges between teachers.

Enhancements on the components have taken place so that the kit more truly reflects the needs of teachers who have not started to use online services.

*5.4 Summary of Comments*

It should be noted that 'disk' respondents (who have been identified as somewhat removed from the true target group), whilst being numerically the same as 'print' respondents, nevertheless generated five times as many requests for more examples and three times as many negative comments.

This was probably due to unrealistic expectations of the information kit which was not aimed at them. This group could be called the 'Gatekeeper of IT knowledge' and they may feel that they stand to lose their power base, if the majority of teachers and students become self-learners, and may not necessarily support an information kit for the target group. This situation was put succinctly by one respondent who stated that:

> *The greatest difficulties I see are equity of access and overcoming computer phobia existent in many teachers, who are more often than not threatened by the fact that students have greater skills in this area than teachers. This impediment is, I feel, one of the greatest hurdles to overcome, one of relinquishing power. In the scenario you describe there would be a great resistance by many who would feel powerless unless adequately trained.*

## 6. Challenges of Developing Distributed Hypermedia

In developing content for a print based document considerable time was spent discussing the nature of the target audience and how best to fine tune the language and presentation to attract that audience. Because Web documents potentially have a global audience, these considerations become less important.

## 7. Summary

At the time of writing, the masters for the print version are being finalised. The questions to be asked in the final evaluation are being developed.

Some of the answers required from the final evaluation include:

- How 'useful' has the information kit been to teachers?
- What could be developed next?
- Have the parameters of the design brief been met?

An evaluation of the final kit will include a comparison of the three media and the group settings in which the kit was used / accessed within each school. The presentation at ASCILITE 95 will include a discussion of the feedback received during the final evaluation and comment on the differences expressed for the three media used.

## 8. References

Canale, R. and Wills, S. (1995). Producing professional interactive multimedia: project management issues, *British Journal of Educational Technology,* Vol 26 No 2 pp 84-93, National Council for Educational Technology.

HotDog http://www.sausage.com

Longworth, J. (1995). *Project Management* Notes from the Management Technology Education Course

Mozock.dll ftp.mcom.com

*PMNet Mailing List*
This list is owned by the Project Management Learning Centre, at the University of Technology, Sydney. A Majordomo, unmoderated, project management list aimed at exchange of email on a range of project management subjects. It is particularly good for discussion of information technology, software use and development. To subscribe send a message to Majordomo@uts.edu.au and enter the word subscribe in the first line of the body of the text.

*Project Management Forum*
The mission of the Forum is to support the pursuit of project management, knowledge and understanding, and the sharing of each with those who seek them.
http://www.synapse.net/~loday/PMForum/

*Project Management Resources*
The Project Management FAQ list. The PMI (Project Management Institute) - US-based, World Wide Web page. The Project Management glossary. http://www.wst.com/pmres.html

Seidman, James *An HTML Extension to Support Client-Side Image Maps*, Spyglass, Inc. http://www.spyglass.com/six/developers_tech_doc4.html

Thomsett, R (1992). *Third Wave Project Management : Managing Information Systems Projects in the 1990's*, Prentice Hall, NY.

## 9. Acknowledgements

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