

Development and delivery of a Graduate Certificate (Open and Distance Learning) via the WWW

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Rationale for the course

Higher education in Australia has undergone momentous changes. These changes include globalisation, increased competition, blurring of the boundaries between other education and training providers, increased levels of user-pay services and increased use of flexible delivery models. Providing courses using Open and Distance Learning (O&DL) methods is increasingly a core activity for universities and other educational providers (e.g. over 70% of USQ students study at a distance). Equally there has been a massive increase in the number of structured training programs undertaken in industry. However, evidence suggests that the majority of people providing these educational programs have little formal training in the use of O&DL techniques and their skills have been acquired "on-the-job". While O&DL courses exist at the Graduate Diploma and Master level there appears to be a need for formal professional development units which may be taken individually or combined into a Graduate Certificate level qualification.

USQ has responded to this need by developing a Graduate Certificate in Open and Distance Learning which will be globally delivered via the Internet. The course will be internationally marketed to academics in universities and colleges, professional trainers, and people involved in the Graduate Certificate in Open and Distance Learning (GC-O&DL). Funding for course development includes a CATHIE grant from the Australian Federal Government and a Global Distance Learning Initiative grant [[HREF4](#)] from AT&T [[HREF5](#)].

In addition to being a marketable course, the GC-O&DL provides an opportunity for USQ to build expertise and infrastructure which will facilitate the movement of its core teaching, learning, research and administrative activities into an Internet

environment. Thus, the GC-O&DL provides a vehicle for USQ to engage in significant institutional development. The development of the Flexible Delivery Project [[HREF6](#)] initiative at USQ is one program which has benefited from the GC-O&DL project.

Course pedagogy

It is well known that simply moving content from one delivery medium to another rarely results in improvements in educational outcomes (Alexander, 1995 [[HREF7](#)], Clark 1983). Evans (1993 [[HREF8](#)]) suggests that the enabling and disabling effects of a delivery treatment is dependent on interactions between features of the content, the users, the tasks they do and the tools provided for them. Based on features of the content, prospective students and the delivery methods, the following pedagogical principles have been used to guide the development of the GC-O&DL:

- a user friendly WWW based environment will be the major way in which students interact with the unit materials, USQ staff and other students;
- USQ materials will provide a theoretical and practical framework guiding students through resources on the web and unit activities;
- based on the structures provided, students will search for information, synthesise this into appropriate products and then share these with other students;
- all learning will build on the individual student's own professional work in Open and Distance Learning and prior learning and experience will be recognised; and
- adult learners will be able to direct their own learning goals, processes and outcomes.

Thus, we are not simply translating an existing course for WWW delivery but attempting to use the unique features of the Web to reach a new group of students (global) and work with them in new and exciting ways (structured resources, search, synthesise and share).

In the age of finger-tip access to vast quantities of information the critical pedagogical problem is the strategies through which people can be guided through this information in ways that are meaningful to their own needs. Thus, students will be provided with annotated pathways or trails (Bush, 1945 [[HREF9](#)]) or "bits about bits" (Negroponte, 1995 [[HREF10](#)]) .

Course structure

A Search Conference was used to identify relevant and required content and the following five units will be offered:

- Perspectives in Open and Distance learning (.5 credit point)
- Systems in Open and Distance Learning (.5 credit point)
- Designing Instruction for Open and Distance Learning (1 credit point)
- Instructional Materials: Development and Delivery (1 credit point)
- Project in Open and Distance Learning (1 credit point)

Detailed unit outlines are available on the Graduate Certificate in Open and Distance Learning site [[HREF11](#)]. The structure of the Graduate Certificate in Open and Distance Learning site will be frequently modified before the beginning of semester 2 (July 22) and thus only the toplevel address is given. The Graduate Certificate qualification requires students to complete 4 credit points and each credit point unit is equivalent to approximately 160 hours of work. The first three units will be offered to a pilot group of students in semester 2 of 1996 and the entire course will be available at the start of 1997 with additional units to be added in subsequent years. The Design and Development unit includes modules focusing on different media (e.g. video, text, audio, Interactive Multimedia, Computer Mediated Communication) which may be repeated for up to 2 credit points. While none of the units have prerequisites, unit selection and sequencing will be based on prior experience and the only compulsory unit for the award of the Graduate Certificate is the capstone Project unit.

Materials development and production

Two groups of people are involved in course development. The first has focused on content and educational issues and comprises people from the Faculty of Education [[HREF12](#)] and the Distance Education Centre [[HREF2](#)]. The second has examined issues related to technical delivery and the ways in which students can interact with the university and each other and includes people from the Information Technology section [[HREF13](#)], the Library [[HREF14](#)] and the Distance Education Centre [[HREF2](#)]. As with any new development, the process of creating the infrastructure for WWW based interactions and mounting content on the Web has been more time consuming than anticipated.

The following principles will be employed to ensure that the GC-O&DL is useable and students are able to devote most of their energies to the educational issues rather than suffering cognitive overload (Garg-Janardan & Salvendy, 1986) from the mechanics of using the WWW.

Balance fragmentation and cohesiveness

Some content should be read sequentially and in its entirety and in this case the information will not be fragmented into individual pages with interconnecting links. Pages which extend over several screens will begin with a "list of contents" outlining the scope of the current page and allowing the user to jump directly to the required section.

Screen design and graphics

All pages will be attractive, useable and interesting within the limitations of reasonable file size and acceptable download time.

Online viewing vs printing and saving

While most people will interact with the content while online it is likely that other modes of interaction will occur. For example, some users may want to print the documents or save them for off-line use. In this case a "print optimised" version of the

document will be provided. Because of the cost of maintaining two versions it is essential that the consolidated version of the document be automatically generated from the fragmented version. Equally, methods will be available to aid users to move between these versions e.g. uniform section names and similar typography.

Navigation and disorientation

A common problem with hypertext systems is that users often become "lost in hyperspace" (Conklin, 1987). Even if users do not become totally disoriented, badly designed sites force the user to devote cognitive resources to understanding the structure of the environment rather than focusing on content. The problem of disorientation will be reduced by using consistent navigation methods and metaphors, screen layouts emphasising the current location, easy access to common "landmarks" and graphical overviews and structured diagrams representing site structure. Jones (1996 [[HREF15](#)]) and Evans [[HREF16](#)] provide examples of dynamic representations, which can be expanded or contracted, thus allowing the user to explore the site at the level of detail appropriate to their needs.

Tools to help the user

In addition to using the WWW to present information, tools will be offered to help users to interact with and use this information.

Finding information

In addition to the option of following thematic links, there is a need to provide Tables of Contents, Indexes and query based search tools to help the user to find information within the site. Each of these tools may use the same underlying information but present features which are more or less useful to individual users. For example, hypertext links are ideal for browsing "local" information but provide no indication that the user has found all relevant information (Frisse & Cousins, 1989; Gray & Shasha, 1989). Indexes and tables of contents depend on recognition of relevant words while a query based search mechanism depends on recall or generation of search terms (Marchionini & Schneiderman, 1988). Thus, the likelihood of providing relevant search tools for all users is increased if there are several approaches.

Understanding information

Glossaries, annotated bibliographies, thematic links and multiple interlinked representations of the same information are strategies that will be offered to help students to understand information.

Using information

Students will be provided with information to guide them in the most effective use of the WWW for their own work. In addition the site will contain tools to help students in note taking, reflection, synthesis and to create their own HTML documents, and publish these either within the course or more widely.

Communicating

Tools such as email, mailing lists, computer conferences, chat and possibly MUDs and MOOs will be used as appropriate to the needs of students, staff and the demands of the content.

User software

Each year the minimum level of software required to effectively interact with the site and complete the units will be specified. While this specification will change on a semester by semester basis an attempt will be made to avoid falling prey to the technological imperative to use the latest features and capabilities. In semester 2 1996 we will require version 2 of later of Netscape Navigator [[HREF17](#)] and Netscape Chat [[HREF18](#)]

Site creation and maintenance

As well as mounting the software in a cost-effective way, the site has been designed so it can be easily maintained and updated. This involves creating procedures to move content from standard word processing files (which academics are familiar with) into HTML files and back again. Currently most parts of the site have been hand-coded, but in future increasing use will be made of machine generated pages based on access to common databases or documents.

Source and processing of unit materials

Early in the development of the course it was decided that all material must be accessible via a web browser. Thus the unit contains:

- purpose prepared WWW materials mounted on the USQ WWW server;
- WWW materials at other sites e.g. Mindweave [[HREF19](#)];
- materials which can be delivered via fax or email from electronic information providers e.g. online or email delivery of documents using FirstSearch [[HREF20](#)] or faxed delivery using UnCover [[HREF21](#)];
- materials which might be available to students through local collections; and
- core resources not electronically available and which will be mounted on the USQ server.

The following two production methodologies have been investigated for mounting non-electronic documents on the USQ server.

1. Acrobat PDF versions of the documents are generated by scanning the originals and then using Acrobat Capture [[HREF22](#)]. This method takes approximately 2 minutes per page and results in file sizes of about 140 K per page; and
2. HTML versions of the documents which are produced by Optical Character Recognition into an RTF file which is then translated into HTML using Microsoft FrontPage. This requires between 5 and 10 minutes processing and proofing per page but results in much smaller file sizes (approximately 10 K per page).

While each method has advantages depending on features of the original documents it appears that the second will be the most commonly used.

Site structure

It goes without saying that the site is under "continuous construction". Currently the site is divided into 4 sections:

1. generic electronic services which will potentially be used by all USQ students (e.g. email, enrolment, assignment submission and results, library, computing, outreach; generic mailing lists and conferences);
2. information about the GC-O&DL course as a whole and individual units;
3. generic content common to all units within the GC-O&DL (e.g. glossaries, bibliographies, databases etc); and
4. unit content in each individual unit and unit specific conferences.

Access to level 4 and parts of level 1 will be restricted to enrolled students through the use of a university allocated Personal Identification Number.

Interaction with students

It is intended that students in the GC-O&DL will be able to perform all interactions (enrolment, unit selection, assignment submission and results notification and other administrative tasks) with the university electronically. Technically these functions will be available during semester 2 but their use will require significant rethinking of the way administrative and academic staff work e.g. will staff print electronically submitted assignments? how will assignments be annotated?

In addition to interacting with teaching staff in individual units GC-O&DL students will be allocated to a single tutor for the entire program who will be able to respond to cross-unit issues. The global nature of this initiative will require local support and for this reason an international consortium of universities has been established in 11 countries including: Brazil, China, Malaysia, Mexico, South Africa, United Kingdom, United States and the Solomon Islands.

Conclusion

The increased use of O&DL technologies has created a demand for formal professional development activities which may be taken singly or combined into a Graduate Certificate qualification. USQ has responded to this demand and the infrastructure provided by the WWW by offering a Graduate Certificate in Open and Distance Learning to a global market.

While the process of developing a WWW based GC-O&DL is time consuming and costly, it offers USQ an opportunity to develop expertise and infrastructure which will be used in the future to move its core activities onto the Internet. Thus, in addition to being a marketable course, the GC-O&DL is a vehicle for institution-wide strategic development, allowing USQ to take advantage of the opportunities which will arise as ubiquitous networks criss-cross Australia and the world.

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Hypertext references

[HREF1]

<http://www.usq.edu.au/users/evansp/home.htm>

Peter Evans

[HREF2]

<http://www.usq.edu.au/dec/>

Distance Education Centre

[HREF3]

<http://www.usq.edu.au/>

University of Southern Queensland

[HREF4]

<http://www.att.com/press/0596/960506.cha.html>

AT&T press release on \$1 million in grants for global distance learning programs

[HREF5]

<http://www.att.com/>
AT&T home page

[HREF6]

<http://www.usq.edu.au/dec/flexdelv/report1.htm>
Flexible Delivery at University of Southern Queensland

[HREF7]

<http://www.scu.edu.au/ausweb95/papers/education2/alexander/>
"Teaching and Learning on the World Wide Web" paper presented at AusWeb'95

[HREF8]

<http://www.usq.edu.au/users/evansp/phdabs.htm>
Abstract of Peter Evans' PhD thesis

[HREF9]

<http://www.isg.sfu.ca/~duchier/misc/vbush/vbush.shtml>
Bush's 1945 article "As we may think"

[HREF10]

<http://www.obs-europa.de/obs/english/books/nn/bdcont.htm>
Partial online version of "being Digital"

[HREF11]

<http://www.usq.edu.au/at&t/>
Graduate Certificate in Open and Distance Learning at USQ

[HREF12]

<http://www.usq.edu.au/its/index.htm>
Information Technology Services at the University of Southern Queensland

[HREF13]

<http://www.usq.edu.au/faculty/educate/>
Faculty of Education at the University of Southern Queensland

[HREF14]

<http://www.usq.edu.au/library/>
Library at the University of Southern Queensland

[HREF15]

<http://www.scu.edu.au/ausweb96/educn/jones/>
Jones paper "Solving some problems of University Education: A Case Study" presented at AusWeb'96)

[HREF16]

http://www.usq.edu.au/users/evansp/toc_eg/
Prototype of a frame-based dynamic (expanding and contracting) Table of Contents

[HREF17]

<http://home.netscape.com/>
Netscape

[HREF18]

<http://home.netscape.com/comprod/chat.html>
Netscape Chat

[HREF19]

<http://acacia.open.ac.uk/Mindweave/Mindweave.html>
Mindweave: Communication, Computers and Distance Education

[HREF20]

<http://www.oclc.org/oclc/menu/fs.htm>

Electronic delivery of documents using FirstSearch

[HREF21]

<http://www.carl/uncover/>

Electronic delivery of documents using UnCover

[HREF22]

<http://www.adobe.com/>

Adobe Acrobat and Adobe Capture

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