



## Full Paper



Back to [List of papers](#)

# On-line Education - A University Strategy

C. J. Pilgrim and M. J. Creek

cpilgrim@swin.edu.au, mcreek@swin.edu.au

School of Information Technology, Swinburne University of Technology

## Abstract

*The emergence of the Internet as a key weapon in the arsenal of the educator has opened up more possibilities than originally conceived. It not only provides mechanisms for communications and management of on-campus courses but with the development of integrated multimedia extensions, the Internet can deliver course material in a rich and engaging manner. Educators are always quick to exploit the full possibilities of new technologies and as such we now see the emergence of institutions that can offer courses to students world-wide. The introduction of on-line education is making the late 1990s a significant make-or-break time for many higher education institutions. This paper presents one university's response to the challenges of on-line education through a systematic and strategic development project.*

## Introduction

On-line education is a mode of course delivery that exploits the communication and informational facilities of the Internet for the delivery of learning experiences to students. It goes beyond traditional distance education through its ability to provide innovative communications between students and staff and with new multimedia extensions, a capacity to deliver content in a rich and engaging manner [1]. The benefits that online education provides to students are not only the enhanced educational outcomes but also the flexibility it offers as students are not bound by time and location [2].

Many universities are now developing an online education capability creating the potential for a global education market where local students could study for degrees at prestigious overseas institutions. The 1996 'The Virtual University' symposium made evident the concern in Australia about the pace of high-quality WWW developments from well-resourced international institutions and the threat this poses for Australian "bricks and mortar" universities [3][4][5]. The potential market saturation will create intense competition from which only the most attractive and educationally sound programs will flourish.

Swinburne University of Technology has decided on a strategic approach to the development of on-line education programs. Swinburne believes that a reputation for excellence in online education can only be established by concentrating effort towards a small number of extremely good programs, which will facilitate market introduction of a range of further material. Hence, at the start of semester 2, 1997, 55 subjects were commissioned for the first phase of Web development. Subjects were selected from across all schools within the university although planning has ensured that a range of complete post-graduate programs will be offered on-line by 1999.

Although Swinburne University is now systematically and strategically developing a WWW presence, it recognises that face-to-face contact will continue to be its primary mode of delivery. Hence the WWW developments will also provide on-campus students, who today have considerable sophistication and expectations in information technology, with an alternative mode of delivery providing convenience and flexibility particularly suiting mature and part-time students. It is hoped that this amalgam of traditional and on-line offerings will place Swinburne University in a strong position to meet the challenges of the future.

## Project Overview

The impetus for the on-line project came from a Chancellery budget allocation specifically for the development of flexible learning. A working party was established to develop a strategy for flexible delivery, which resulted in a series of recommendations to focus on WWW delivery as an urgent priority. From these recommendations, an Executive Management Committee comprising several senior staff was given the overall responsibility to ensure developments are coordinated around the university and that such developments are compatible with the strategic direction of the university. A small Reference Group comprised of staff active in multimedia and WWW development was also created to develop detailed plans for the project. Several sub-committees were formed from this group to deal with specific aspects of the project, including: the development of the prototype system; the choice of the Course Management System; investigation of the requirements and technical issues for online communications; evaluation of authoring and multimedia development tools; and establishing quality control and evaluation mechanisms.

A phased process of implementation has been adopted for the project. The first phase involves the development of all subjects according to a defined structure and schedule for completion by the end of the year. It is expected that the material developed from Phase 1 will be available to supplement conventional delivery for on-campus students in 1998.

The second phase of development will enhance each lesson with the addition of activities that exploit the multimedia capabilities possible in a hybrid approach to flexible delivery. This phase is expected to be complete by the end of semester 1 1998. This material will be used for on- and off-campus delivery to existing students as an adjunct and alternative to conventional delivery. The project recognises the importance of involving students in the development and evaluation of online material hence Phase 2 will employ a variety of students who will be on their Industry Based Learning year to assist in the development of courseware. Students will be drawn from Computer Science, Multimedia, Engineering and Graphic Design courses creating a large team with a broad variety of skills who will offer technical support to staff.

Following feedback from use of the material developed in the first two phases, a final phase may be required to bring the material up to a standard of international best-practice for genuine delivery to national and international markets, probably requiring professional input.

## Subject Planning

### Methodology

The content development methodology has been designed around several key pedagogical principles that relate to good learning outcomes. These principles focus on the belief that by defining learning objectives and providing a self-paced learning environment students will become more responsible for and involved in their own learning. Consequently the structure of the system will be student-centered and delivery will exploit experiential learning through the use of multimedia, simulations and constant feedback.

The general structure of on-line subjects will include a definition of the subject's goals and objectives then a series of lessons and associated activities with each lesson beginning with an on-line audiovisual lecture and concluded by an on-line formative test. Learning will be enhanced through a variety of activities that exploit the communications features of the Internet including electronic mail, discussion groups and the possibility of synchronous on-line tutorials.

It was determined that all subjects would be structured in a consistent manner maintaining a common 'look-and-feel' to ease shifting between subjects for students. A consistent approach also ensures a level of quality control and maintains the perception of a professional and coherent approach. Hence a four level structure was created:

1. Subjects - each subject having its own subject code and development team
2. Modules - each subject having a number of modules, each with clear objectives and assessments.
3. Topics - each module would have several topics, which are the primary teaching component of the subject and directly address module objective.
4. Activities - each module may have several learning activities which may include online presentations, simulations, electronic and text readings, asynchronous and synchronous discussions, group and individual projects, assignments and exercises, videos, guest presenters, etc

Each subject team produced two key documents: the Goal Statement and the Subject Blueprint, which were submitted to a panel for approval prior to development.

### Goal Statement

The purpose of this document is to outline the plan of action each subject team intend to take to develop the subject. This document contains a brief overview of items such as:

- Subject name and code
- Credit Point Value of the Subject
- Level and stage of the subject in the context of the overall course
- Subject Aim
- Target Audience (likely entry knowledge and student profile)
- Content Sources
- Topics and interactions
- Feedback and Assessment strategies - in the context of your topics and total subject

### Subject Blueprint

The purpose of this document is to define all aspects of the content and delivery aspects of the subject. This document consists of a series of forms which define the subject development plan and is used to both guide and monitor subject development and plan for resource assistance:

- The Subject Overview form outlines the subject description and objectives, the breakdown of the subject into modules and the list of topics associated with the subject.
- The Subject Content form summarises, in a tabular format, the activities for each topic. This form provides an overview of plans for content delivery and learner interactions at the topic level as well as a timeline for development.
- The Content Delivery form details how a particular topic is to be delivered, e.g., via web pages, animated presentations, simulations, electronic and/or multi-modal references, etc.
- The Learner Interactions form describes the types of discussions and assessments that will be used to engage the learner with the topic.

The Goal Statement and the Subject Blueprint provided not only a mechanism for managing the development progress from an accounting perspective, but also quality control over the development of content and learning activities.

# Implementation

## Subject Templates

A set of template web pages was designed defining the organisational structure and delivery environment. The goal of these template pages was to:

- provide a straightforward development environment for to staff rapidly develop courseware with a minimum of technical support.
- ensure that material developed conforms to some pedagogically and aesthetically prescribed approach whilst allowing some creative individualism and support different learning paradigms.
- ensure that, as much as practicable, subjects convey a sense of commonality in their user interface and thus facilitate rapid and easy navigation by students.



Figure 1 - Subject Management Page

Students would obtain access to the Subject Management page through appropriate security pages that provide entry only to students who are enrolled in the subject. The subject management page (Figure 1) presents various options including:

- **Subject Outline:** links to general information including goals and objectives of the subject, prerequisites and required texts and references.
- **Subject Modules:** links to pages containing the subject content in terms of modules, topics and activities (Figure 2).
- **Student Status:** links to information concerning the student enrollment status and progress.
- **News:** this links to a variety of news groups containing staff announcements and general discussions.
- **Broadcast Lecture:** links to pages containing Powerpoint™ presentations with Real Audio™ providing an audiovisual presentation of the content.

**Swinburne University of Technology** *ONLINE EDUCATION*

**Subject 040 - Software Engineering 1**

## Modules

1. Introduction to SE
2. Software Lifecycle
3. Requirements Elicitation
4. CASE tools
5. Implementation
6. Validation & Verification

Module 1		Module 2	
1 Topic 1 of module 1	3 Topic 3 of module 1	5 Topic 1 of module 2	7 Topic 3 of module 1
2 Topic 2 of module 1	4 Topic 4 of module 1	6 Topic 2 of module 2	8 Topic 4 of module 1

Subject Home

Make Contact

Document: Done

**Figure 2 - Subject Modules Page**

- Policies and Procedures: links to information relating to assessment policies, etc.

The Subject Modules page (Figure 2) contains a list of the modules in the subject and links to the topics within each module. The Topic page (Figure 3) lists the learning objectives and the activities to be completed.

The type of learning activities were chosen at the discretion of the subject development team but may include:

- Introductory reading
- Scheduled synchronous group discussion
- Asynchronous discussion group - on a particular questions(s)
- Labs, exercises, tutorials
- Summary
- CML assessment
- Assignment specifications

The screenshot shows a Netscape browser window with the following content:

**Swinburne University of Technology** *ONLINE EDUCATION*

**Subject** 040 - Software Engineering 1

**Module** Topic Number 01

After working through this lesson, you should be able to:

**Objectives**

- describe what Software Engineering is
- describe the nature and qualities of software
- define the software application domain
- list the activities of software development
- describe the software development process

**Subject Home** **Activities List**

**Make Contact**

Activity 1
Activity 2
Activity 3
Related Assignment
Continuous Assessment

Figure 3 - Topic Page

The Project Reference Group reviewed a large number of authoring and development systems for general use by staff in the project. Netscape Composer was chosen as the recommended HTML editor due to its ease of use and integration with other Netscape Communicator components such as Netscape Messenger, Netscape Conference, and Netscape Collabra.

The project will generate tens of thousands of files hence a mandatory file naming convention was implemented. The basis for filenames is the three digit subject code with the remainder of the filename using mnemonic codes to aid developers.

### Course Management System

The Project Reference Group investigated the purchase of a number of commercial course management systems with widely varying quality and features including TopClass, Lotus Learning Spaces, First Class, New Media, Asymetrix Librarian, NAME, QuestWriter, WebCourse in a Box, WebCourse Tools, WebCT, cMile and OTFE's Virtual Campus. These systems provide integrated student management software along with communications, computer managed testing and a environment for the development, delivery and management of on-line courses.

Whilst many of the systems that were evaluated met the specifications, none provided adequate support or adaptability for local use hence a basis course management system is being developed internally as a framework for putting subjects online until a more useful product became available.

### Communications

One of the key strengths of the WWW as an on-line education environment is the power of communications which facilitate collaborative learning student groups, conferencing, peer discussion and student-staff dialogue. The project team has investigating a number of communications tools including WebBoard, NetMeeting and CUSeeMe. Netscape Collabra was chosen due to its integration with the other Netscape Communicator components.

## Training and Staff Incentives

Most of the 55 staff involved in the project in Semester 2 were given half-time release from teaching duties, an upgrade of PC equipment, ISP support from home and funds to attend a conference on Web education on successful completion of the project. Staff also received training in the latest educational technologies. The training was interspersed with the development effort and addressed issues such as: the pedagogy of online delivery;

managing online communications; creating Web pages using Netscape Composer; creating online audiovisual lectures using Powerpoint and Real Audio; copyright and intellectual property; writing questions for computer assessment; online graphic design; delivery management, etc. A subsequent staff mentoring and coaching scheme is under consideration.

A web-site has been established for the project that informs all staff of plans and developments as well as providing a forum for staff input and consultation through on-line discussions in which all staff can participate. The project web site <http://www.online.swin.edu.au> includes:

- a list of all staff involved along with links to personal web pages
- a 'design shop' containing regular features on "good and bad web page design"
- a set of on-line discussion groups with topics including student assessment, content delivery, content design and communications issues.
- links to a set of utilities for developing on-line educational material
- an on-line scheduler where each subject teams development timetable is maintained
- links to each on-line subject's home page
- the training schedule and booking forms
- previous training materials.

## Evaluation

An evaluation process is being developed for use at the conclusion of each phase of development and during the initial trial phases of on-line material. The evaluation process will utilise a checklist to examine both the pedagogical and structural aspects of the developed material and will involve both peer and student assessors.

## Future Issues

There are a number of issues relating to the management and delivery of on-line courses that are to be addressed in the future. These include:

- marketing of courses
- legal issues relating to protection of copyright
- financial issues relating to costing and payment for courses
- institutional alliances with other local and international providers
- certification, accreditation and examination issues
- a hybrid CD-ROM/WWW approach for the delivery of courseware.

## Acknowledgements

The authors wish to acknowledge the work of members of the on-line education project group towards this paper and that opinions expressed in this paper are of those of the authors and may not reflect those of the whole project group.

## References

Benyon, D., Stone, D. & Woodroffe, M. (1997), Experience with developing multimedia courseware for the World Wide Web: the need for better tools and clear pedagogy, *Int. J. of Human-Computer Studies*, 47, (1), 197-218.

Pennel, R. (1996), Managing Online Learning, *Proceedings of the Second Australian World Wide Web Conference*, Gold Coast, p315-320.

<http://www.edfac.unimelb.edu.au/virtu/morrison.htm>

<http://www.edfac.unimelb.edu.au/virtu/luke.htm>

<http://www.edfac.unimelb.edu.au/virtu/vc.htm>

(c) C. J. Pilgrim and M. J. Creek

The author(s) assign to ASCILITE and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The author(s) also grant a non-exclusive licence to ASCILITE to publish this document in full on the World Wide Web and on CD-ROM and in printed form with the ASCILITE 97 conference papers, and for the documents to be published on mirrors on the World Wide Web. Any other usage is prohibited without the express permission of the authors.

---

Back to [List of papers](#)

This page maintained by [Rod Kevill](#). (Last updated: Friday, 21 November 1997)

NOTE: The page was created by an automated process from the emailed paper and may vary slightly in formatting and layout from the author's original.

