

# **DEVELOPING A CERTIFICATE COURSE IN COMPUTING FOR DELIVERY VIA THE INTERNET IN THE UNITED KINGDOM**

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## **Introduction**

The aim of the Department for Continuing Education is to make the University of Oxford accessible to people in ways, which complement the University's provision for its resident members. The Technology-Assisted Lifelong Learning (TALL) programme was established in 1996 to further this aim by exploiting technology to extend the Department's reach.

The TALL programme aims to create a financially self-sustaining programme within five years that meets the needs of a wide range of adult learners by:

1. reviewing and identifying effective forms of technology-assisted lifelong learning
2. conducting applied research into technology-assisted lifelong learning
3. developing course frameworks, courses and educational services that exploit technology in support of lifelong learning
4. evaluating all work undertaken and disseminating the outputs and insights gained to local, national and international audiences

Oxford is an unusual type of institution. Among its characteristics that are particularly advantageous to TALL are:

- *brand* - the Oxford name is known and respected throughout the world
- *academic staff* - many are acknowledged leaders in their fields
- *resources* - Oxford's library, museums and Oxford University Press represent a rich treasure chest of potentially incorporatable resources
- *Department for Continuing Education* - Oxford's Department for Continuing Education is one of the most innovative parts of the University and probably the most successful continuing education department in the UK

But the other side to these advantages is that the Oxford name is closely guarded leading to a degree of caution about how new ideas are applied, the research dominance of the university is not always helpful, and institutional strategy has yet to fully recognise the role that technology-assisted lifelong learning could play. TALL has therefore sought to build on Oxford's strengths and be understanding of its hesitations.

The *Certificate Course in Computing via the Internet* is one of the first courses to be offered world-wide from Oxford via the medium of the Internet.

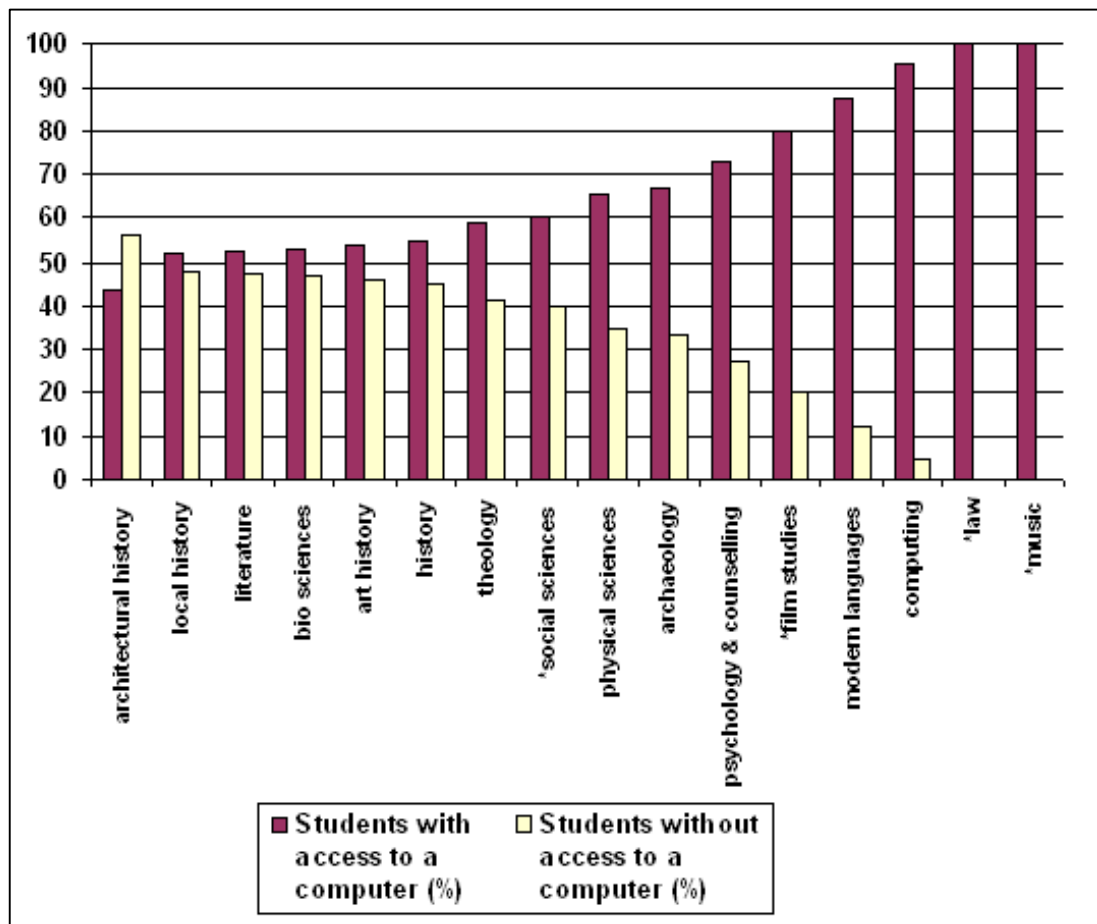
## **Underpinning research**

A key concern of the TALL programme at its inception was to ensure that its work was informed by a sound understanding of the nature of the potential market for online education. Two main pieces of research were conducted. The first was a study of the attitudes of students on existing conventionally taught Departmental courses ([www.conted.ox.ac.uk/Divisions/Tall/Survey/index.htm](http://www.conted.ox.ac.uk/Divisions/Tall/Survey/index.htm)).

Three surveys were carried out with different student groups. Female students attending Public Programmes courses outnumber males by more than 2 to 1, and the average age of all students is just under 60. Surveys of Internet users show males outnumbering females and an average age of below 30. It might therefore

be anticipated that relatively few from this sample group would be interested in Internet courses but approximately 60% had access to a computer and 25% to the Internet. When reviewing students attending courses run by Continuing Professional Development (CPD) and International Programmes, the figures rise to 99% and 88% respectively. 31% of all students on Public Programmes courses would consider Internet-based courses, as would 76% of those on CPD and International Programme courses.

Figure 1: Computer access of students by discipline studied



The Department currently teaches 16,000 students per year, so these figures suggest a very large potential demand for online course. TALL-developed courses will also be marketed to students for whom regular attendance at Oxford-based classes is not an option.

A second research project has focussed on the experiences of some five North American pioneers of online courses. An examination of nine Internet-based courses from the five universities offered some illuminating insights into what leads to success in this medium. The study's findings will be published in Spring 1999.

### Course models

In addition to the research findings described above, TALL's approach to course design has been influenced by considerations of cost, subject and programme strengths within the Department, and also Oxford's traditional tutorial-based method of teaching. Three course models have emerged and courses are being developed using each. The models are:

1. *Hybrid* - face to face teaching is combined with Internet-supported distance learning. Using Entwistle's six functions of student learning, face to face teaching is used for *orientation* and *motivation*, while *information acquisition*, *elaboration*, *clarification* and *confirmation* are mainly supported at a distance. In this way the two modes of teaching are used optimally.

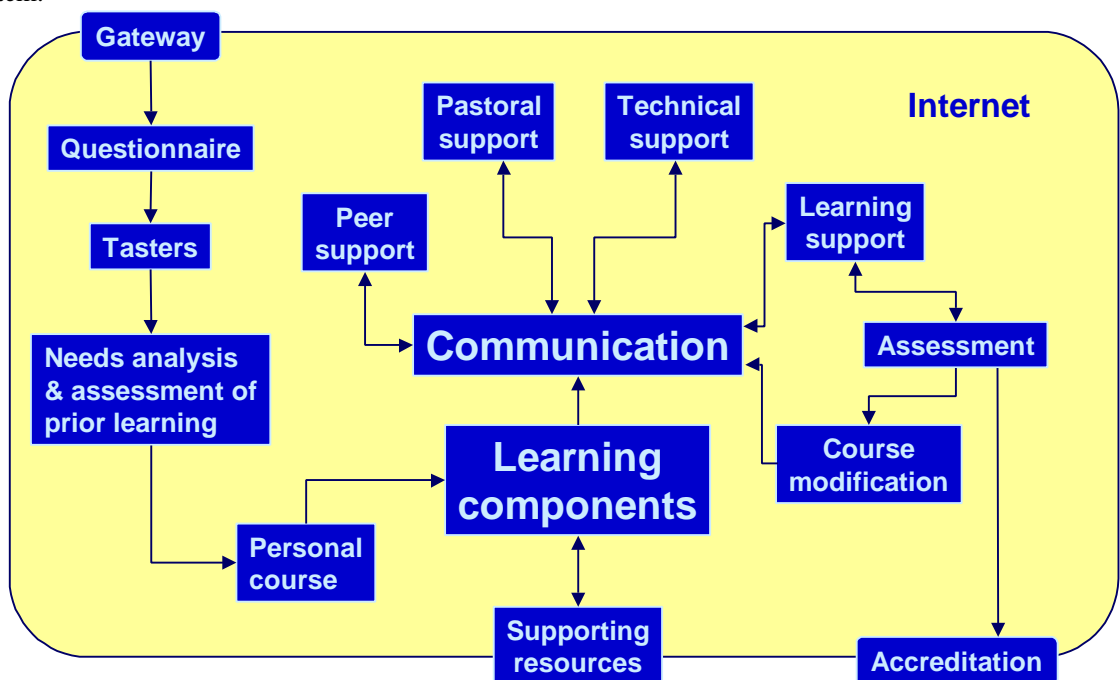
Application: Certificate Course in Computing ([www.conted.ox.ac.uk/courses/dlcert/](http://www.conted.ox.ac.uk/courses/dlcert/)).

2. *"Bush taxi"* - one drawback of fully asynchronous courses (where students can start at any time and progress at whatever pace they choose) is that students lose the support of a cohort group and often make slow progress. This model seeks to retain group learning (utilising group projects) while avoiding the rigidity of a course that runs just once a year. The course is advertised without fixed starting dates but commences as soon as a viable number of students have enrolled (typically 8 to 12).

Application: Databases for Historians, now part of Diploma in local History ([www.conted.ox.ac.uk/courses/lhist1/](http://www.conted.ox.ac.uk/courses/lhist1/)).

3. *Curriculum on demand* - in CPD individual student needs can vary widely. There is also a premium on courses that can fit around demanding work schedules. This model starts by assessing a potential student's prior learning and current needs and then proceeds to create a course, tailor made to meet those needs. The course is constructed from a "Lego set" of learning components.

Application: Oxford Professional Update System.



## Figure 2: The Oxford Professional Update System

Running though all the models are:

- a high level of tutorial support - the tutor acts as mentor to the student, engaging in dialogue with the student about their learning
- a highly modular approach to content creation and delivery - modules, or learning components, represent on average 15 minutes of study time. Each is relatively simple in its use of media but in combination the modules create a varied and interesting *multiple media* learning environment while avoiding the cost and complexity of *multimedia*.

### **Technical aspects**

Around a dozen module types have been defined. They range from illustrated documents in PDF format intended for printing and offline study, through audiographic presentations (a spoken explanation of a topic illustrated with PowerPoint slides), to Macromedia Flash animations (for example of a phagocyte being ingested by a white blood cell). The objective is always to use the simplest technology that satisfies the educational requirement.

In addition to course specific modules, some courses are supported by one or more databases, accessed via a Web browser interface or downloaded for students to manipulate locally. These are used by students to support a problem-based approach to learning.

TALL used Java to create interactive exercises as part of an experimental course designed for intermediate level learners of Italian. Initially the exercises were created using CGI scripts but these proved awkward to use and did not fully meet the requirements of the language teachers. The overhead in terms of added development time for Java proved high but the resulting exercises offered a higher degree of interaction that could have been achieved in any other way.

TALL is working towards production systems that move beyond the handcrafted approach that the World Wide Web seems to encourage. It is attempting to identify stable technology that is simple to develop, easy for students to use and educationally effective.

### **Design aspects**

Visual communication is particularly important when students are remote as confusions cannot be as easily dealt with as in a class. TALL has a full-time graphic designer on its staff and also employs a design consultant and a medical illustrator. Designing for online course, as with any design project, is best approached by asking the questions:

1. What do we want to say?
2. Who do we want to say it to?
3. How will we say it?

TALL tries to find the most appropriate technology and the most effective design solutions for the students' needs.

Designing for new media is different in several respects from old. Content needs to be varied, interesting, informative and succinct, but consistency is equally important. Situational awareness must be obvious no matter how "deep" the page. Careful attention to the application of an agreed presentational style can contribute very significantly to navigability and consequently to student comfort levels.

### **Managing the development of online courses**

The TALL programme is innovating in several areas simultaneously and adopting radically different forms of teaching. In implementing such an important change TALL requires the capability to adapt swiftly to meet new challenges whilst ensuring that it drives towards an attainable organizational goal. Accordingly TALL has adopted a 'projects approach' to managing its future.

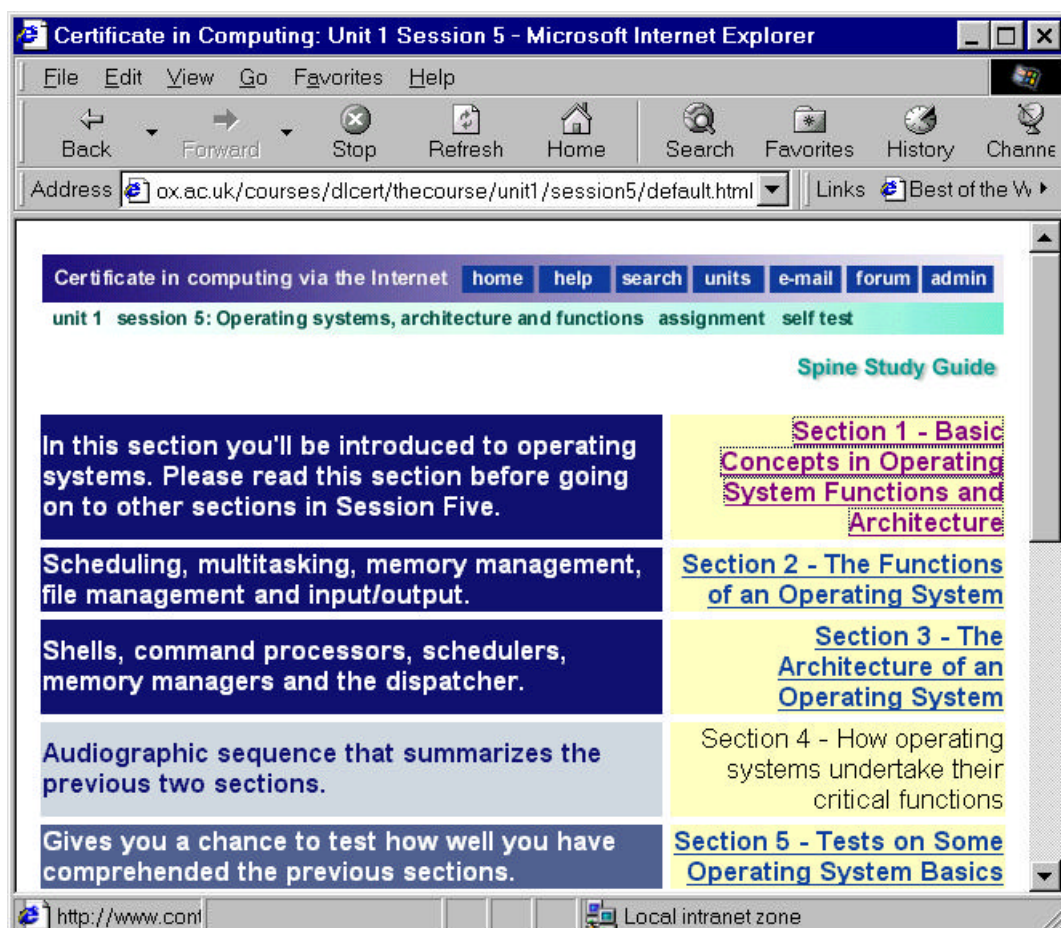
Projects are, in the modern sense, strategic management tools. No longer the preserve of the engineering sector, project management is being recognised more widely as a way of working that allows people to be used to best effect. Some who consider themselves to be involved in a creative process do not tend to welcome terms like timesheet or deadline. Nor do they see a need formally to manage risk and quality. However, from the definition of requirements, through design, creation of tangible results, operation and review, the discipline of project management allows people to perform extraordinarily well and extraordinary people to perform beyond expectations. TALL is creating a framework and working environment that allows this to be achieved.

## The Certificate in Computing Course

The Certificate Course in Computing via the Internet is a two year part-time course which carries 120 Credit Accumulation and Transfer Scheme (CATS) points at Level 2. This makes it equivalent to 1/3 of a degree at 2<sup>nd</sup> year undergraduate level, but the course is designed to be free-standing. It is intended particularly for people who use computers routinely as part of their working lives but probably in a limited and repetitive capacity. The course offers them the depth and breadth of understanding to enable them to play a full part in IT policy making and decision taking within their organisations.

Figure 3: A session study guide

Students carry out much of their work on the course in small groups. Two part-time tutors are allocated



to each group of 12 students. The tutors do more than help students with any problems they might encounter – they act as guides and mentors taking a proactive interest in each student's learning.

The course materials are presented in a variety of formats including text and audio. Students are guided through them by a "spinal document" for each section. This introduces each component to the students and advises them on how interpret the materials. In addition to the Internet-supported study students attend two one week summer schools in Oxford.

Demand for the course has been high with over 300 applications for 60 places in three months. In the future the course may be licensed to other universities for them to offer as part of their own programmes.

### **Long-term strategy**

TALL is still at a very early stage in realising its vision of how Oxford could be using technology to reach a substantial number of students world-wide. The lessons learnt so far have convinced us we should

- stay close to the learner
- work with Lego style building blocks (fine granularity)
- seek out unmet educational needs (of which there is no shortage)
- avoid being that technologically driven *but*
- not be constrained by past practice
- grow through investment (all online courses should be capable of repaying their development costs within 5 years)
- form strategic alliances

Global competition for online education is intensifying with for profit concerns such as the University of Phoenix and real education setting the pace. A key driver in this growth is the need for a better way to address "just in time" educational needs, particularly in continuing professional development.

Students are gradually becoming more discerning and will become skilled at mixing and matching courses from multiple providers. Success in the future will be limited to those who can meet the needs of an increasingly demanding clientele.