

THE ECONOMICS OF OPEN LEARNING VIA THE INTERNET IN THE UNITED KINGDOM

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Workshop

The economics of open learning via the Internet

Introduction

The Technology-Assisted Lifelong Learning programme at the University of Oxford has been developing courses for students to take from around the world through the medium of the Internet. In this paper I examine the costs of developing these courses, and compare them with alternative modes of delivery.

The courses we have been developing are all targeted at adult students. They may be taking the courses for personal enrichment, professional and career development or to equip them better to pursue an amateur endeavour. I am not considering here the relative costs of delivering conventional undergraduate courses via the Internet as substantially different factors apply.

Face-to-face versus paper-based versus Internet-delivered

The bulk of Oxford University's adult education is classroom-based, with typically 12 to 30 students to a class. These classes are normally rated very highly by students, but there is relatively little opportunity for one-to-one interaction with the tutor, and supporting text-based materials do not form an integral part of the course. Because of the relatively small class sizes the costs per student are fairly high.

Paper-based courses can be very effective, particularly when developed to the high standards set by Britain's Open University, but students can feel isolated by a lack of contact with other students. This can be combated by including group tutorials, organised on a regional basis, or by adding a summer school to the course. Due to the economics of printing, courses cannot easily be changed from one year to the next.

Courses that are delivered entirely by the Internet can combine the student and student to tutor interaction of face to face teaching with the learning resources of a paper-based distance learning course. They can also include a wider variety of elements than either alternative. Oxford's Internet-delivered courses are constructed from the following building blocks:

- 1) *Audiographic presentation*: Uses Real Presenter - PowerPoint slides synchronised with a spoken commentary. These work best when kept to 15 minutes or less.
- 2) *Online video*: Real Video used at a resolution that allows delivery via modems.
- 3) *Formatted document for offline study*: Documents saved in PDF (Acrobat) format to ensure maximum portability.
- 4) *Web document (HTML)*: These are used for integrating the various course components and for linking to off-site Internet resources.
- 5) *Web-accessible database*: Documents are stored in a database and accessed via the Web.
- 6) *Individual student activity*: This varies between practical (programming, use of Excel, etc), research-based (for example searching for information on the Internet) and reflective (such as noting their own experiences of an application of technology).
- 7) *Student group activity*: Students work in groups (size typically 3 to 6) to complete a shared task (for example a programming project). This is supported by the computer conferencing system WebBoard.
- 8) *Student tutor interaction*: Students communicate with their tutors by email, voice mail or telephone. Tutors also participate in student group activities.
- 9) *Multiple choice and other computer-accessible questions*: These are used for self-assessment.
- 10) *Assignments*: A system for electronic submission has been established. Tutors mark the assignments "digitally" and return the marked assignment simultaneously to Registry and to the student.

The Internet is also uniquely flexible. Courses can be rapidly updated without the expense of a reprint. Unlimited amounts of resource material can be included without significantly affecting publishing costs. Students can select course element on the basis of interest or need, or a tutor can create a learning thread for a student based on their knowledge of what they might require.

Design objectives

As with all projects the objectives are to develop the course on time, within budget and to a high standard of quality. These objectives are further broken down as follows:

1. *Simplicity* – the best solution is the simplest one that meets the requirement
2. *Consistency* – within the course and also as far as possible across courses

3. *Familiarity* – adoption of a predictable repeating pattern will facilitate learning and help students feel comfortable with the course
4. *Accuracy* – ensuring that all materials are checked for spelling, grammar, readability and all aspects of the system are fully checked before release
5. *Navigability* – providing table of contents, index, site map, search facility and clear signposting indicating where a student is within a course
6. *Economy* – avoiding elements that add unnecessary cost either to production or delivery
7. *Clarity* – in the use of written English
8. *Granularity* – working with small reusable learning objects classified using IMS metadata standards
9. *Legality* – ensuring that all copyright material has been cleared
10. *Documentation* – developing a project plan and systematically recording revisions

Development costs

The bulk of the costs of developing an online course are of course staff. A typical development team for a one year part-time course might be:

| | | |
|-----|-------------------------------------|------|
| 1. | Subject specialist course designer: | 100% |
| 2. | Learning technologist: | 50% |
| 3. | Web technologist: | 50% |
| 4. | Graphic designer: | 50% |
| 5. | Programme director: | 20% |
| 6. | Project manager: | 40% |
| 7. | Administrator: | 40% |
| 8. | Evaluator: | 25% |
| 9. | Marketer: | 20% |
| 10. | Academic course director: | 50% |
| 11. | Content author(s): | 100% |
| 12. | External assessor: | 5% |

These 5.5 full-time equivalents might work on the project on average for 12 months each, though not necessarily all for the same 12 month period. The cost of employing these staff in a British university would be approximately £165,000 (US\$270,000). Other costs might typically be:

| | |
|------------|--------------------------------------------|
| £ Sterling | |
| 1. | Computers and peripherals 10,000 |
| 2. | Development software 6,000 |
| 3. | Consumables 1,000 |
| 4. | Materials licensing 8,000 |
| 5. | Overheads (including accommodation) 66,000 |

Add these costs to the staff costs and the total rises to £256,000 (US\$422,000).

Delivery costs

One advantage of online courses is that they are relatively easy to update since a change to the course resources on the server is immediately accessible to current and future students. We estimate that for courses in rapidly moving areas, such as computing, 20% of the course will need replacing each year. For subjects where the subject matter is more stable, the main updating requirement will be to reflect changes in the delivery technology. Course maintenance and update is therefore estimated at between £25,500 (US\$42,000) and £50,100 (US\$84,000) per annum. The cost of maintaining the course server (software licences, maintenance, backups, etc) adds a further £10,000 (US\$16,500) to annual costs

Most other delivery costs are student number-related. At Oxford they approximate to:

| | |
|------------|-----------------------------------------|
| £ Sterling | |
| 1. | Tutors 200 |
| 2. | Technical support 50 |
| 3. | Administration 100 |
| 4. | Assignment marking and moderation 100 |
| 5. | Overheads (including accommodation) 250 |

Running costs thus amount to £60,100 (US\$100,500) plus £700 (US\$1150) per student per annum.

Student costs

The annual student fee has been set at £2500 (US\$4100). This makes the cost of the equivalent of one year of full-time study £5000 (US\$8200). This compares very favourably with residential study since the cost of travelling to, and residing at, a university would result in a considerably higher figure. Additionally students require a suitably configured computer system (typical cost if not already owned: £1000) and access to the Internet. In the UK several companies are now offering free Internet access (funded by advertising), so the cost of access is no more than the cost of a local phone call. Four hours online time per week for 40 weeks would cost approximately £100 if the student was mainly studying in the evenings and at weekends. The final cost to the student is that of printing out course materials which is typically £20 to £60 according to the course and the

printer being used.

Residents of the European Union benefit from British Government funding for student places. This brings the annual fee cost down to approximately £700 with the balance being paid to the University through a grant from the Higher Education Funding Council for England.

The business model

The cost of marketing rises as the desired number of students rises. It is reasonable to reserve 10% of fee income for marketing. With a popular course it may not be necessary to spend as much as this but where the course is highly specialised, the cost of reaching each potential student may be high. Allowing 10% for marketing, income and expenses of delivering the course according to the number of students enrolled, is as shown below. The table shows that the payback period is highly dependent on student numbers, but that the course is still viable with relatively few students.

| Enrolment | Gross income | Marketing | Course-related | Student-related | Total costs | Surplus | Years to break-even |
|-----------|--------------|-----------|----------------|-----------------|-------------|---------|---------------------|
| 50 | 125,000 | 12,500 | 60,100 | 35,000 | 107,600 | 17,400 | 14.7 |
| 75 | 187,500 | 18,750 | 60,100 | 52,500 | 131,350 | 56,150 | 4.6 |
| 100 | 250,000 | 25,000 | 60,100 | 70,000 | 155,100 | 94,900 | 2.7 |
| 150 | 375,000 | 37,500 | 60,100 | 105,000 | 202,600 | 172,400 | 1.5 |
| 200 | 500,000 | 50,000 | 60,100 | 140,000 | 250,100 | 249,900 | 1.0 |

Course income and expenditure in £ Sterling according to numbers of students

Minimising costs

Costs are minimised at the development stage by:

1. *Avoiding multimedia but working instead with multiple media* – each learning component uses one of several formats and a rich learning environment is created by their combination.
2. *Working to a fine level of granularity* – learning components represent 15 minutes study time on average. Their small size facilitates maintenance and flexible delivery.
3. *Very careful project planning and monitoring* – the allocation of time to project management minimises time wasted through lack of clarity about what is required and avoids the need to increase expenditure as deadlines approach.
4. *Establishing the market before starting development* – risk is reduced by confirming the size and strength of the intended market in advance.

At the delivery stage costs are minimised by:

1. *Delivering all materials via the Internet* – this passes the cost of printing to the student and avoids the need for the University to carry stock and to mail bulky packages to students.
2. *Using part-time tutors* – this not only reduces teaching costs but also facilitates scaling up.
3. *Automated administration* – assignments are submitted electronically, marked “digitally” and returned to student and Registry electronically. All forms associated with the course are online and submitted via the Internet.

For the student the main cost saving comes from being able to continue in employment and fit the course around existing commitments.

Conclusions

The economics of Internet-based courses make them highly attractive for meeting course needs for 100 to 200 students per year. These numbers are too low to be viable for traditional distance learning approaches, but are also too large to be easily accommodated in classroom teaching. In addition Internet-based courses bypass many of the logistical problems of delivering courses to students in any country of the world.