

THE HIDDEN COSTS OF NETWORKED LEARNING — THE IMPACT OF A COSTING FRAMEWORK ON EDUCATIONAL PRACTICE

Bacsich, P. and Ash, C.

Virtual Campus Programme and School of Computing and Management Sciences
Sheffield Hallam University
Sheffield S1 1WB
United Kingdom

Email: p.bacsich@shu.ac.uk
http://www.shu.ac.uk/virtual_campus/cnl/

Abstract

A UK study by the authors on the Hidden Costs of Networked Learning in universities has produced a new planning framework for courses (traditional or using networked learning). This paper details the top-level findings of the study, focussing on impact on staff stakeholders and the relevance to other countries.

Keywords

Networked learning, cost, hidden cost, online learning, flexible learning, change management, cost-effectiveness, cost-benefit, virtual university, virtual campus

Introduction

The authors completed in August 1999 a 6-month UK study funded by JISC investigating the Costs of Networked Learning, with specific focus on “Hidden Costs”. The aim was to produce a planning document and financial schema which would accurately record the costs of Networked Learning and aid the planning of such courses.

Hidden costs had not formerly been adequately treated in an educational context. They include costs which are unrecorded (by accident or design), such as academic staff unpaid overtime, and those which are “lost” in larger budgets.

Specific examples are: the time and extra costs incurred by staff away from home supervising a remote student; student-purchased inkjet cartridges to use on their home PC to print assignments; or a networked PC in a computer lab blocked by students using it for social email.

Moonen (1997) identified, particularly succinctly, four reasons why costs are difficult to quantify:

- There is disagreement about which costs should be taken into account.
- Reliable data is unavailable because it is not collected in a systematic manner.
- Recorded costs are unstable and evolving.
- Some data is perceived as confidential and is not publicly available.

In order for our project to succeed these barriers had to be surmounted. However, we found another barrier: each previous costings approach used a different vocabulary — these have to be “uniformised” before they can be analysed.

Our study has come at a crucial moment in the UK. There has been much concern from funders of Higher Education about how funding is spent and how the quality of teaching and learning can be maintained while student numbers steadily increase, as the proportion of Lifelong Learning students grows, and funding per student decreases. In particular the Funding Councils commissioned a report from the Joint Costings and Pricing Steering Group (JCPSG 199b), which builds upon the KPMG (1997) work.

A note on terminology

We take the phrase ‘Networked Learning’ to be synonymous with ‘Online Learning’, ‘Technology Enhanced Learning’, etc.

Methodology

Our methodology had four main components:

- a detailed literature review of over 100 sources
- a sectoral survey to gain an overview of the extent of Networked Learning in UK universities and the costing issues raised
- case studies based on interviews of key staff at seven universities
- a small survey of the student-perceived costs of Networked Learning.

Conclusions from the process

Top-level conclusion

In order to understand the “true” costs of Networked Learning, the only way forward is to have a framework using which one can understand the costs of teaching and learning, subsumed within the costs of universities, subsumed within the costs falling on all stakeholders.

Literature search

Earlier UK work on costing innovative learning systems in Higher Education was found to be of little use. Work on costs of IT in HE was more helpful. Some “whole campus” costing models (Jewett 1998) were intellectually stimulating but of little practical value. General costing work, such as the KPMG Costings Guidelines (KPMG 1997) and the JCPSG tutorial (1999a) was very helpful. The Flashlight work (Ehrmann 1999) on costing was very relevant, even though the conceptual structure and vocabulary was very US-based. The literature from the training field (Crabb 1990; Hunt & Clarke 1997) is highly relevant to the issues for universities.

Sectoral survey

The sectoral survey established that the costs of Networked Learning (overt and hidden) are little considered at present. There is no accepted approach towards what should be costed and how it should be done. Costing at an “activities” level was not done at present but was generally accepted as something that would need to be done in the near future - but under what categories, at what level and by which methodology remained unclear.

Case Studies

From the survey returns six universities were chosen to represent the sector, plus Sheffield Hallam University. These universities were at varying stages of introducing innovative learning systems and represented both old and new universities across the country. The Study Team interviewed senior level managers down to working academics over a two-day period.

We found that where Networked Learning is taking place, it is mainly instigated and delivered by a small number of enthusiasts. Networked Learning is becoming more widely accepted by students and more utilised by staff. In most cases these small pockets of innovation in Teaching and Learning were beginning to influence other staff members. Universities are moving towards Networked Learning for very similar reasons, such as improving quality and access without increasing the costs to the university. On the whole the view was (in our view, an old-fashioned one) that Networked Learning has the potential to enhance the learning experience but only if embedded into existing paradigms not as a replacement of undergraduate teaching. However, cost analysis of Networked Learning is not currently on university agendas (although universities are aware that overall cost analysis is firmly on the Funding Councils’ agendas).

Barriers

Barriers to Networked Learning

Despite a generally positive feeling, there were many forces said to be inhibiting the wider introduction of Networked Learning activities. Using Lewin's Force-field Analysis, of driving and restraining forces (Lewin 1951), we identified eight main restraining forces. Interestingly, none were directly to do with costing methods, but several were implicitly dependent on costing issues. For details see Ash and Bacsich (1999).

Barriers to costing

A general move towards costing activities was thought to be a good idea. But both the survey and site visits confirmed that there are organisational barriers to accurate costing. The main ones are:

- the reluctance (from academics, management and administration) to consider any form of time sheet

- reluctance (from management) to acknowledge that staff work “overtime”
- the inconsistency and non-granularity of internal accounting
- worries about Activity Based Costing - all universities stated quite categorically that their financial regimes would not adapt to an Activity Based Costing framework (this was before the recent JCSPG report was released).

Three other smaller barriers raised were:

- “cost of costing” issue
- “cost of having done the costing” — that is, once the costs were identified universities would be forced to deal with them and this in itself would be costly
- inhibition of innovation if costs become known — “academics do not want to know how much their teaching costs”.

The key, stated one Deputy Head of Finance, was to strike a balance and provide value for money, pointing out that a danger of such exercises was to know the “cost of everything and the value of nothing”.

Planning document and financial schema

We have proposed (JISC 1999) a Planning Document and Financial Schema as follows:

1. It can operate at the level of a whole university; a department or faculty; a course; or a unit (module) within a course.
2. It takes account of the costs incurred (or saved) by the additional stakeholders in the learning process other than the university - in other words, it does not treat the university as a closed system. The three Primary Stakeholders are the University, Staff and Students.
3. It is based on Activity Based Costing, now increasingly common in industry (Cokins 1996). Our approach follows KPMG (1997) work, with modifications in the light of Flashlight (Ehrmann 1999) and the distance education theorists, especially Rumble (1997).
4. It takes account of the division of academic time into Research, Teaching and Other (including administration). There are some detailed issues on classification but in general terms we recommend following the guidelines from KPMG (1997) and JCPSG (1999b).
5. It takes account of the Activities *within* the course development process and proposes a model for these, the 3-phase model, if there is no existing model relevant. The 3-phase Course Life Cycle model involves all stakeholders.

6. It is flexible in terms of allocation of overheads, with an orientation to overheads based on actual usage rather than estimation.
7. It requires some kind of recording of academic effort spent on activities. JCPSG (1999b) and the results of our survey outline some of the problems with this.
8. The planning aspects are based on HEFCE (1999) work, but with the vocabulary changed to reflect course development issues. Adapting the HEFCE text turns out to be quite easy.

Some caveats

Though it is possible to propose the nucleus of a Planning Document and Financial Schema in six months, further development, consultation and testing will be needed to prove its viability and worth.

Conventional teaching and learning must also be costed by the same methodology as we have proposed, in order for comparisons of the costs and benefits to be drawn.

There is a need to locate and evaluate finance software suitable for the “new era” of Activity Based Costing in universities. Standard spreadsheets are not likely to cope with the complexity.

The Course Life Cycle model

Where universities do not have their own course life cycle model, and few do, we recommend the adoption of the following 3-phase model:

1. Planning & Development
2. Production & Delivery
3. Maintenance & Evaluation.

This model evolved after much hard work and discussion on the number and sub-components of phases. It has been checked against the educational literature including Bates (1995) and Daniel (1996) and some test scenarios. It follows classic course planning frameworks from the distance education sector but also incorporates in a more visible way than usual in such literature the need for Quality Assurance and Course Maintenance.

To reassure the distance education theorists worried about dominance by the conventional sector, Table 1 gives an example of the model as it applies to distance education. The scenario is taken from the project’s Final Report (JISC 1999).

Table 1: Activity Based Model of a distance education course (*Dr Birtwright is the Course Team Chair of the Course Team for the new Open University course on Post-Deconstructionism. This is a course with 8 TV programmes and an optional CD-ROM thanks to a generous US grant.*)

Phase	Types of task
Planning & Development	(Team effort.) Review related work. Write course units and related print material, work with BBC on TV programmes, acquire content for CD-ROM. End up with an electronic master copy of all the course units, videotapes of each TV programme, and 600 Mb of data on hard disc ready to be pressed on the CD-ROM.
Production & Delivery	Print and post course units and all supplementary material. Broadcast the TV programmes, send CD-ROM to pressing plant and post to students.
Maintenance & Evaluation	US funders require a full evaluation by educational technologists. Online version of the course must be delivered in two years time for global market - must transform course material to Web format and set up computer conferences, using the OU's existing conferencing system.

Impact on stakeholders

In this section we go beyond what was done in the JISC study and raise the issues of how the staff stakeholders in the Higher Education sector are likely to react to our proposals (which, at the time of writing, are not yet public). Views of students will be covered in other work.

Top management

We can regard institutional views as coming from the top management that we interviewed — Pro-Vice Chancellors, Director of Computing, Head of the Library, etc.

Most interviewees believed that costing Networked Learning was a positive activity — they believed that more investment in this area was needed but were unwilling to fund this when the monies can so easily be spent elsewhere. A costing methodology would help to track the costs of learning, both conventional and innovative, and encourage the correct allocation of costs. It would make departments more aware of the costs of both conventional and networked approaches and allow departments to set their own agendas in this area.

However, top management felt that the lack of take-up of Networked Learning is not just to do with costing — more compelling pedagogical evidence for the benefits of Networked Learning was badly needed before strategic moves towards Networked Learning could be taken. Notwithstanding this, we expect top management to accept our approach, especially since it is so consistent with recent JCPSG and HEFCE proposals in the more general area of university finance and planning.

Academic staff

The study has uncovered the costs being absorbed by academic staff, which were previously hidden. Staff consumables costs, overtime and development time were highlighted as issues in need of redress.

Staff interviewed said that considerable costs are off-loaded onto staff, most of whom have purchased a home computer, and regularly pay for Internet connect time and for colour printing consumables. Between 20% and 90% of staff were thought to have PCs at home and use them for work. The reasons given were to extend “working hours” to incorporate marking, the development of new materials, and general office administration, all of which were said to have increased dramatically over the years.

Time was considered to be a major cost item as far as staff were concerned. There was a lack of time for staff training and development of materials. There was also a lack of recognition that these were activities that needed extra time aside from current teaching and research. Staff in one university were supposed to spend one third of their time on administration, teaching and research — but this allocation did not allow for the development of new materials whose use may save time in the future. Usually, staff time was costed only for commercial activities, and then generally under duress. Networked Learning had mostly been embarked upon with little consideration for the time needed to develop and then run courses.

We expect academic staff to support our conclusions in that they recognise the contribution staff make to institutional success over and above contracted hours of work. However we expect staff to be concerned about what they might regard as intrusive monitoring of their work in terms of “timesheets”. Several of the issues are likely to attract the interest of unions, despite their lack of interest so far.

Academic management

We expect Deans and Heads of Department to welcome our approach in that it may empower them to negotiate better with service departments over overheads. They are likely to be concerned about how to implement the time monitoring of academic staff that our system requires - they will need to find some acceptable way of recording academic effort on teaching and learning. Some departments with declining markets or lack of cost-effectiveness may resist seeing their business weaknesses exposed.

We have proposed using a planning approach still commonly thought to be suitable only for the justifying of new buildings and just possibly (by “advanced thinkers”) for IT developments. It will take time for academic managers (and academics) to come to terms with the impact of our proposals on the “typical” course approval process, dominated still by educational and “quality” issues, not financial and technical ones.

Academic managers will have to learn to use the tools that are (slowly) being used by administrators to solve more general financial and management problems. They will need to engage in a creative dialogue with administrators using a common vocabulary.

Service departments (especially Library and Computing Service)

We expect service departments to be concerned about moves towards charging for their facilities on a usage basis rather than by estimation. Already in the UK there has been concern about JISC charging universities for network traffic to the US, not just the general principle but also the specific method of usage-based charging.

Administration and finance staff

In order to facilitate the necessary change in educators, the brunt of such additional work is likely to fall on administrators. A separate paper (Bacsich, 1999) covers this, but briefly, we see key impacts as follows on the main central departments:

- Finance: handling greater co-ordination with Funding Councils and other institutions over costing issues, including in collaborative projects.
- Planning: change managing the move towards a “finance-aware” model for planning courses which is much closer to that for buildings and IT than at present.
- Human Resources: more HR issues of academic workload, working hours, overtime, additional rewards, stress, home working, supply of university equipment for home use.
- Student Services: managing the “customer expectation” issues of students paying more, implicitly not just explicitly, towards their own learning.

Students

Students are a key stakeholder — our work has confirmed this. However, student issues are not the subject of this paper. Briefly, our student survey showed that there is a disjunct between student beliefs — in essence, students believe that Networked Learning *increases* costs to them — and student behaviour — that coming to campus (and the time and cost it takes) is less and less attractive. Students seem to believe that, and act as if, time has an opportunity cost to them — in other words, they now behave like trainees in industry. Students also undertake more paid work and their ownership of personal computers is higher than generally recognised.

The NUS (1999) survey stated that the average student spends £89 on computer software and hardware per annum - our survey gave similar results; with the main justification being student fear that marks would be lost if assignments were not typed..

We would expect students, and student unions, to support the conclusions of our study.

Further work

Among the follow-on studies we propose, one of the most interesting is the development of a joint approach with countries such as Australia with an approach to HE similar to the UK. This could be based on existing collaboration and expertise including Alexander (1998). The main issues to be looked at would in our view be on “harmonisation”:

- concepts and vocabulary - see Ehrmann (1999) for a US-centric view
- course life cycle development models
- financial categories as defined by Funding Councils
- activity breakdown of academic effort, in particular what is “teaching”?

Tables 2 and 3 show US-UK comparisons (JISC 1999).

Table 2: UK-US comparison of academic activities

<i>UK — KPMG</i>	<i>US — Flashlight</i>
teaching, including main course undergraduate and postgraduate	teaching
research, including grants, contracts and general research	research/scholarship, professional growth
other service activities including short courses and consultancy	consulting/freelance work (in the UK, freelance work would not usually be done within “work time”)
department administration and other professional activities	administration other
faculty administration - and university administration	administration

Table 3: UK-US comparison of budget categories in a typical university

<i>UK — after HEFCE</i>	<i>US — Flashlight</i>
Staff costs	compensation (employee salaries and benefits)
Depreciation	Hidden Costs (depreciation)
Other operating expenses	Direct, Non-Personnel Services (e.g. consumables)
Overhead	Hidden Costs (not depreciation) — buildings costs and utilities etc.

Acknowledgements

The authors are grateful for funding from the Committee on Awareness, Liaison and Training of JISC (the Joint Information Systems Committee of the UK Higher Education and Research Funding Councils) and from Sheffield Hallam University. They would also

like to thank their project staff and many staff across the UK Higher Education sector who participated in the work.

References

- Alexander, S., McKenzie, J. and Geissinger, H. (1998) *An Evaluation of Information Technology Projects for University Learning*, Australia: Committee for University Teaching and Staff Development (CUTSD).
- Ash, C.A. and Bacsich, P.D. (1999) 'UK higher education institutions — how flexible, how virtual, how soon?' *Abstracts for Online Educa 1999*, Berlin: November 1999, ICEF.
- Bacsich, P.D. (1999) 'The hidden costs of Networked Learning — the consequences for university administrators'. Paper presented at International Meeting of University Administrators, Edinburgh: September 1999.
- Bates, A.W. (1995) *Technology, Open Learning and Distance Education*, New York: Routledge.
- Cokins, G. (1996) *Activity-Based Cost Management — Making it Work*, New York: McGraw-Hill.
- Crabb, G. (ed.) (1990) *Costing Open and Flexible Learning*, Coventry: NCET.
- Daniel, J.S. (1996) *Mega-Universities and Knowledge Media — Technology Strategies for Higher Education*, London: Kogan Page.
- Ehrmann, S.C., Delinger, L., and Milam, J.H. (1999) *Flashlight Cost Analysis Handbook Version 1.0: Modeling Resource Use in Teaching and Learning with Technology*, Washington: AAHE.
- HEFCE (1999) *Appraising Investment Decisions*, HEFCE Guide 99/21, Bristol: March, HEFCE.
- Hunt, M. and Clarke, A. (1997) *A Guide to the Cost Effectiveness of Technology-Based Training*, Coventry: NCET.
- JCPG (1999a) *Costing and Pricing for Decision Makers in Higher Education: User Guide*, Bristol: HEFCE.
- JCPG (1999b), *Transparency Review of Research*, Bristol: July, HEFCE.
- Jewett, F. (1998) *A Simulation Model for Comparing the Costs of Expanding a Campus using Distributed Instruction versus Classroom Instruction (BRIDGE)*, California State University. ONLINE
http://www.calstate.edu/special_projects/mediated_instr/
- JISC (1999) *Costs of Networked Learning*, Bristol: JISC (in press).
- KPMG Management Consulting and Joint Funding Councils (1997) *Management Information for Decision Making: Costing Guidelines for Higher Education Institutions*, Bristol: HEFCE.
- Lewin, K. (1951) *Field Theory in Social Science*, New York: Harper Bros.
- Moonen, J. (1997) 'The Efficiency of Telelearning', *Journal of Asynchronous Learning Networks*, 1(2), ONLINE.
<http://www.aln.org/alnweb/journal/issue2/moonen.htm>
- NUS (National Union of Students) (1999) 'Consultation on Section 28 of the Teaching and Higher Education Act', Submission to DfEE, London.
- Rumble, G. (1997) *The Costs and Economics of Open and Distance Learning*, London: Kogan Page.

© Bacsich, P. and Ash, C.

The author(s) assign to ASCILITE and educational non-profit institutions a non-exclusive license to use this document for personal use and in course of instruction provided that the article is used in full and this copyright statement is reproduced.

The author(s) also grant a non-exclusive license to ASCILITE to publish this document in full on the World Wide Web (prime sites and mirrors) and in printed form within the ASCILITE99 Conference Proceedings. Any other usage is prohibited without the express permission of the author(s).