The Costs of Networked Learning – Phase Two

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with the assistance of
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on behalf of the
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The JISC Committee for Awareness, Liaison and Training (JCALT) addresses the human and organisational issues of deploying C&IT within HEIs. Its parent body, the Joint Information Systems Committee (JISC), is the strategic advisory committee working on behalf of the funding bodies for higher and further education (HE and FE) in England, Scotland, Wales and Northern Ireland. It also works in partnership with the Research Councils.

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Preface

In 1998, the JISC Committee for Awareness, Liaison and Training commissioned a study to investigate the hidden costs of developing and supporting networked learning. The resulting study "The Costs of Networked Learning" provided a theoretical framework and concluded that it was difficult to cost this activity as there was no consistently used costing approach across the education sector at that time.

Following this study, JCALT has funded this extension, the aim of which was to take the theoretical framework and develop it into a practical handbook. This report focuses on one particular approach to costing: Activity Based Costing, piloted at a School Level within Sheffield Hallam University. It was found to be a useful tool in this context. As well as focusing on the specific example and generating generic guidelines for institutions interested in ABC, the final report also adds to the debate about costing in higher education. In this respect it is of wide interest to the HE community and JCALT will share these findings with the Funding Councils' Joint Costing and Pricing Steering Group.

David House
Chairman, JCALT
August 2001

Foreword

This is the second phase in the series of reports on the 'Costs of Networked Learning'. It has taken the methodology developed in phase one and applied it in a real higher education institution.

Taking the theory and applying it in a real institution has been a major challenge, and the timescale for delivering the report has been rather longer than the 6 months originally proposed. But in our view (and with hindsight), costing is like many other 'e-related' initiatives in HE and FE: speed is not always of the essence.

The wider context of the report is an era of major new UK initiatives such as the e-University, and ever-increasing interest in costing, exemplified by the Transparency Review and other reviews of HE and FE costing and income structures.

The outcome of phase two comprises two volumes: a Report plus a Handbook, which will help other institutions to carry out their own work in this area.

One top-level recommendation from our Report is to confirm our earlier view that there is no point in doing Activity Based Costing work using traditional spreadsheets.

It is also the case that institutions will need specialist help to kick-start such a study. We are especially grateful to the staff of Armstrong Laing plc for their help and advice, especially to Moira Abernethy for her tireless support and cheerfulness.

Within the University, special thanks are due to the members of my research team and to my colleagues (management, academic, administrative and technical) in the School of Computing and Management Sciences – during a challenging period for the institution, its management and staff.

Dr Paul Bacsich, Professor of Telematics
Telematics in Education Research Group
Sheffield Hallam University
September 2001

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0. Executive Summary

This is phase two in the series of reports on the 'Costs of Networked Learning' (CNL). It has taken the methodology developed in phase one and applied it in a real higher education institution. The outcome of phase two comprises two volumes: a Report plus a Handbook, which will help other institutions to carry out their own work in this area. This is the Report.

- Given the drive towards more transparent financial operation and quality control, Activity-based Costing (ABC) is, undoubtedly, the way forward. This study has piloted ABC in Sheffield Hallam University at a School level and found it to be a very useful tool. We have found that the standard ABC methodology is suitable for use in universities without major adaptation. As was expected, the usefulness of data coming out depends on the accuracy of information going in.

- ABC uncovers hidden costs that are 'generally absorbed' but not those which are 'fundamentally unrecorded', such as staff overtime (categories as defined in the CNL1 report). ABC can be used on the whole institution, individual faculty and individual course level and can be extended with ABM and Balanced Scorecarding, for example. In addition, ABC allows the monitoring of quality in key areas, income analysis and profitability and so on.

- In order to undertake ABC successfully, suitable software and professional support is vital. As predicted in CNL1, spreadsheet products, such as Excel, are not complex enough to tackle ABC effectively. However, there is no need to develop software specifically for the education market since existing products are available, from suppliers such as the Armstrong Laing Group, ABM Systems, ABC Technologies and Baum Hart Partners.

- Literature referring to ABC use in universities is sparse; our investigations show that activity is taking place, but much is currently unrecorded. Where case studies are published, trials concentrate on the non-teaching aspects of university operation; we believe this shies away from the real issues involved. Universities must accept a pay-off / balance between amount and quality of data collected in terms of the results and cost of the exercise; opting for simplicity is likely to produce inconclusive and unusable results.

- We hope the resources provided in our handbook will enable others to undertake a similar exercise, with professional support and suitable software, at a greater level of detail in the first instance. Complete and accurate ABC takes time; it has to be reasonably complex to be accurate, most studies record two or three iterations to the model before a full ABC system is reached. Overall, ABC complexity depends on what the institution is trying to achieve; decisions on this must be made in advance.

- Our enquiries show that the 'cost of costing' argument is not thought by the sector to be an adequate reason for not costing and that general opinion now seems to be in favour of 'getting-on with it'. A number of studies show that costing must be approached with the long haul in mind to avoid short-termism – to really reap the benefits of an ABC approach it must be firmly embedded into university operation.

- The Transparency Review is based on the principles of ABC; full ABC is just one more step and the potential benefits far outweigh the difficulties involved.

- Our work on the 'key issues' (Chapter 6) illustrates that staff-borne costs are considered to be a separate issue mainly connected to quality of management; and must be addressed separately. Student-borne costs should not be reimbursed by the institution or central funding body, but it is now widely accepted that that they should be taken into account when planning a course.

- Ultimately, costing data needs to be placed in context for it to be useable / reliable; arbitrary figures are meaningless to all and will not represent the full picture. If not, any form of costing will lead to decisions being made on a cost only basis.

- Contrary to other ABC accounts, which report that academic staff are sceptical about the exercise and afraid of the results it may yield, we found that those of our staff who put aside their initial scepticism were very enthusiastic, once they understood what was happening.

Project recommendations

These recommendations are for anyone considering a similar study to ours.

1. We expect that undertaking ABC at the School / Faculty level, for the first time, will take one full-time person approximately six months, depending on the scope of study and the information available; this person does not need to be an ABC or financial expert, but does need to be sensible and 'finance-aware'.

2. The standard ABC methodology is suitable for use in universities without major adaptations.

3. Senior management commitment, with a champion, top-down support and bottom-up interest is fundamental.

4. The purchase of suitable software and professional help is essential; but both already exist.

5. It is important to adequately scope such an exercise; the amount of work involved and depth of investigation depends upon the required outcome.

6. We advise a pilot study first to identify what data is readily available and what data needs to be generated before undertaking full-scale ABC.

Recommendations for further work

Our recommendations for further work fall into two distinct groups – those for funding bodies and those for further work in a similar vein.

1. Central funding bodies may have to agree to accept full-cost proposals for both teaching and research; if full costing is advocated, it will increase pressure for institutions to be funded on a full-cost basis, otherwise financial restraints will prevent an increasing amount of innovative work.

2. There is much to gain through implementing ABC in higher and further education in the UK, but individuals and single institutions are suspicious and apprehensive; clear direction from the central bodies, such as that demonstrated in Australia, is urgently needed.

3. The 'cost of costing' is not seen by the sector as a reasonable excuse for not undertaking costing; it is essential that the benefits are promoted before the cost of the exercise and that consensus, across the sector, is reached with regard to the cost of having done the costing.

4. It is imperative that central funding bodies note that practical studies of this nature must be longer than six months in duration.

5. Studies which require participating institutions to divulge sensitive information, such as costings data, must be large enough, in terms of number and diversity, of institutions involved, to anonymise institutions successfully.

6. Since e-learning is still a small part of most individual institutions' activity, a large centrally funded multi-institution study on the cost-effectiveness of e-learning is crucial.

7. Academic staff working hours must be addressed as a separate issue; ABC takes 100% of time worked, not the number of hours and, consequently, the hidden cost of over- (and under-) time, to both the individual and the institution, will continue to be overlooked.

8. It would be very interesting, and immensely beneficial, to align our work to that of the Transparency Review team, thus providing a 'united front' on costings.

1. Introduction

> *"… gone are the days when academics can look out from their ivory towers without fear of the consequences of pursing uneconomic ventures or ill-considered initiatives. […] That is not to say that loss-making ventures cannot be undertaken in any circumstances. It merely provides that all concerned are aware of those losses, the reasons for them and the actions required to sustain them."*
>
> Cropper and Cook (2000)

This document is the Final Report for the second phase of the 'Costs of Networked Learning' project, funded by the Joint Information Systems Committee (JISC) and run by Sheffield Hallam University. CNL2 builds upon the CNL1 work published in October 1999. The main aim of CNL2 was to take the theoretical framework arrived at during phase one of the study and develop it into a practical handbook or set of guidelines.

1.1 Report overview

Chapter two provides a brief overview of the first Costs of Networked Learning report published by Sheffield Hallam University in October 1999. This section also outlines the assumptions with which we approach this second report.

Chapter three outlines the methodology followed by the research team in this project.

Chapter four provides an overview of Activity Based Costing (ABC) for the non-expert, outlining its development and the major software providers.

Chapter five covers an update of the literature review begun during the first phase of the project. It specifically concentrates on an analysis of international costing projects also undertaking trials and also on literature focusing on ABC in educational establishments.

Chapter six looks at some of the key issues identified during phase one of the study and outlines attempts made by the team to resolve then or reach consensus within the sector to inform future JISC work in this area.

Chapter seven focuses on the ABC trial undertaken at Sheffield Hallam University with the assistance of the Armstrong Laing Group.

Chapter eight covers the ongoing dissemination connected to this project, including a report of dissemination events since the end of CNL1 and also those which are planned.

Chapter nine focuses on the management of this project, concentrating specifically on the problems encountered by the team and how they were over come.

Chapter ten presents the project conclusions and recommendations to JISC and the sector resulting from the work undertaken.

1.2 Project funding

This project was funded by the Joint Information Systems Committee (JISC) for Awareness, Liaison and Training (JCALT). JISC is the strategic advisory committee

working on behalf of the funding bodies for higher and further education (HE and FE) in England, Scotland, Wales and Northern Ireland. Initial funding was for a six-month period ending in December 2000; additional funding, and a four-month extension, allowed the project team to overcome a number of difficulties. Supplementary support was provided by the School of Computing and Management Sciences at Sheffield Hallam University.

2. CNL1 Overview

"University leaders will either make major decisions based on 'gut' feelings or good information. Those institutions that can adapt to the new environment, measure their cost effectively and put this information to good use will have an advantage."

DETYA and Ernst & Young (2000)

In December 1998, a team of researchers at Sheffield Hallam University were awarded a £28,000 grant by the JCALT to undertake a six-month project on the Costs of Networked Learning. The aim of the project was to identify the hidden costs involved in Networked Learning and to produce a schema using which these costs could be accurately recorded. The remit also included the development of an accompanying planning framework to aid the development of Networked Learning initiatives. The project was completed in July 1999.

2.1 Main conclusions from the CNL1 study

1. The literature search established that the past literature is confinable, with a slow rate of accretion. The literature from the training field is relevant.

2. Earlier UK work on costing innovative learning systems in HE was of little use. More general costing work, such as the Joint Funding Councils Costings Guidelines (1997), has been helpful. The Flashlight (Ehrmann and Milam, 1999) work on costing is likely to be of great relevance.

3. The Sectoral Survey established that the costs of Networked Learning are little considered at this stage, with problems of scope and inconsistent information.

4. The site visits confirmed that Networked Learning is prevalent in all types of HEI, but that cost analysis of Networked Learning is not currently on the agenda (although HEIs are aware that it is firmly on the Funding Councils' agenda).

5. The site visits also proved that student concerns and behaviour are neither well understood nor seen as being strategic.

6. Both the survey and the site visits confirmed that there are organisational barriers to accurate costing. The 'cost of costing' issue was raised.

7. Institutions did identify a useful set of Hidden Costs to complement those uncovered in the literature.

8. Institutions felt that more compelling pedagogical evidence of the benefits of Networked Learning was needed. Organisational, quality and software issues were also considered as barriers.

9. The study has uncovered costs being absorbed by academic staff which were previously hidden. Staff overtime was highlighted as an issue.

10. The 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 – time has an opportunity cost to them.

2.2 Planning document and financial schema from CNL1

We propose a Planning Document and Financial Schema with the following features:

1. It can operate at the level of a whole Institution; 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 Institution. The most important of these additional stakeholders are Students and Staff (own time and resources).

3. It takes account of the division of academic time into Research, Teaching and Other (including administration).

4. It takes account of the activities *within* the course development process and proposes a three-phase model for these if there is no existing relevant model.

5. It is flexible in terms of the methods of allocation of overheads.

2.3 Project recommendations from CNL1

1. We support the centrally initiated drive towards coherence in university accounting procedures.

2. Conventional teaching and learning must be costed via the same methodology.

3. There is a need to locate and evaluate finance software suitable for the 'new era' of ABC in HEIs.

4. A co-ordinated 'mega-survey' approach is needed, including recognised procedures by which figures are collated.

2.4 Assumptions

From the above, and the main CNL1 report, we distil the following assumptions which we hope will aid those who are not familiar with previous work in this area.

- Traditional costing methodologies are not suitable to reach accurate costs of individual courses.

- That ABC is the way forward.

- That ABC software can cope with this problem much better than a typical spreadsheet system such as Excel.

- Time-sheets are one method but there are more achievable ways of measuring staff time.

- Costing must be integrated / embedded into institutional operation.
- Any costing system must function on a number of levels – from the whole institution to a single course.
- Staff and students absorb a large number of the hidden costs identified.
- SHU covers a wide range of general University activities and behaviours.

3. Methodology

> *"The power of activity-based costing is in its ability to clearly portray cost and nonfinancial information. This includes portrayal of the relationships between the two as well."*
>
> Turney (1996)

The main aim of this project was to build upon the conclusions and recommendations of phase one of the Costs of Networked Learning project to develop the handbook, or set of guidelines, which allow individuals and teams within higher educational establishments to cost courses, both innovative and traditional, more accurately.

It was important to identify a suitable ABC software provider. It was recommended in our first report that it was important to "locate and evaluate finance software suitable for the 'new era' of Activity Based Costing in HEIs" (p2) and also directly by the DETYA and Ernst & Young (2000) report:

> "An institution embarking on the development of an ABC model for the first time should look at purchasing a specialised software package to support this project. The selection and purchase of a specialised ABC modelling tool will reduce the time associated with the model development and enhance the quality of the outcomes reported."

This second phase of the project also sought to address and resolve some of the key issues identified in phase one of the study to the satisfaction of the sector.

3.1 Identification of a supplier

It was decided very early in the project that we did not have the expertise or inclination in the team to build our own ABC software. A web search was conducted and suppliers that were recommended in the literature were reviewed. A number of demonstrations from suppliers were undertaken before the team settled on the Armstrong Laing Group product Metify ABM.

3.2 Literature review

Our literature review expands the literature database established during phase one of the study. During this phase of the project we concentrated specifically on literature relating to ABC both in general use and in university use; the progress of the Transparency Review team and also the trials of other costings projects internationally.

3.3 Key issues

During phase one of this study a number of key issues were identified. One of the strands to phase two of the study was to resolve a number of these issues to the satisfaction of the sector. To this end, a workshop was run at the April Networked Learning 2000 conference, which outlined and discussed a number of these issues. Following this, a number of the issues were discussed on the project listserv.

3.4 Trial

Initially, it was hoped that representatives in the three selected areas of the University would be assisted by the team in costing the activities of that particular area. Unfortunately, this did not happen and we lost two areas. Focusing on our remaining area, all of the work was undertaken by our team. We followed the tried and tested Armstrong Laing methodology, which was only slightly tailored to HE where absolutely necessary.

3.5 Reporting

Reporting for this project is fairly extensive, as we needed to report to the SHU department within which the trial took place; we also presented to the University Senior Management Team in conjunction with Armstrong Laing representatives. This report sees us reporting back to our funding source, JISC, and to the sector as a whole.

4. Activity Based Costing – An Overview

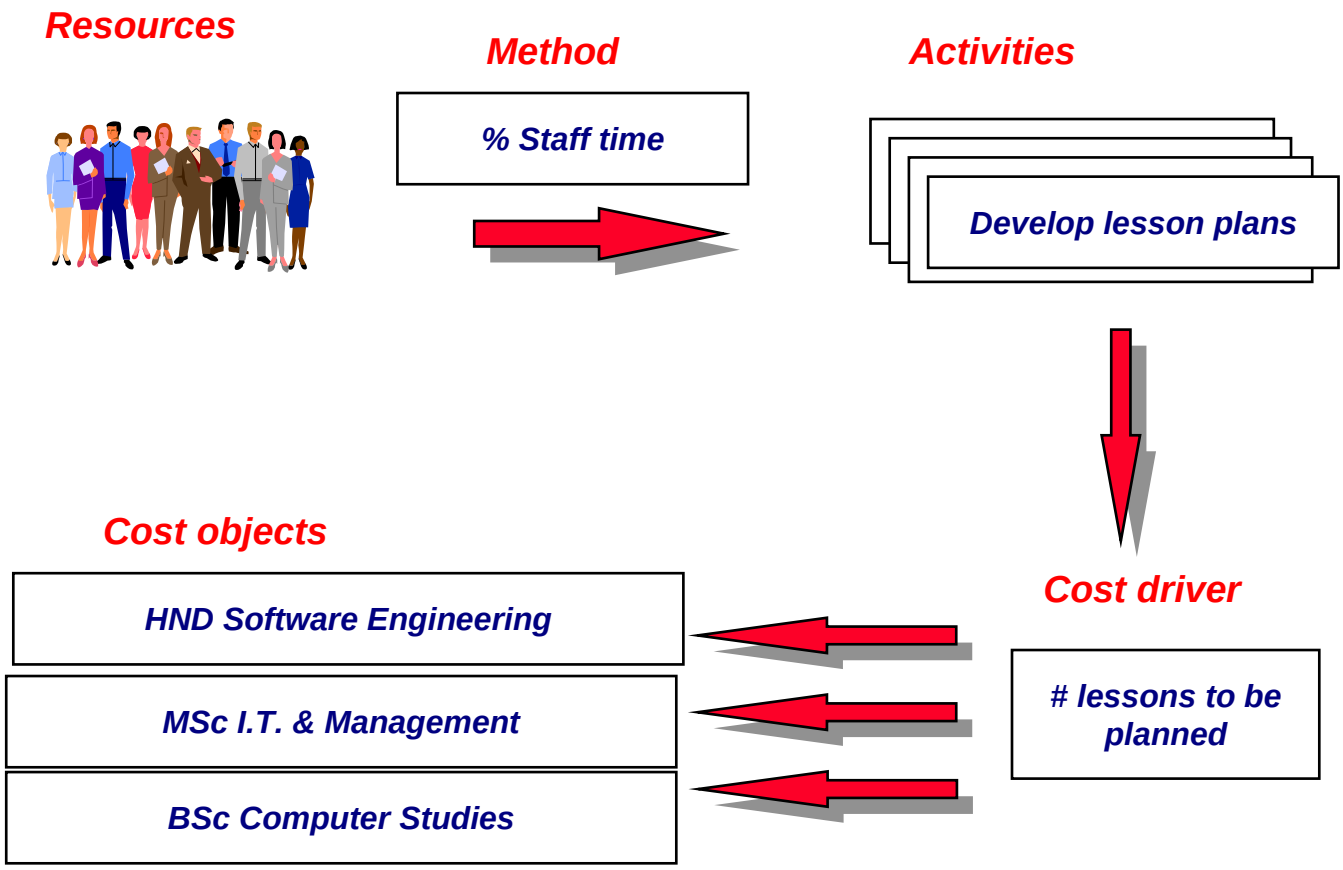
Activity Based Costing is a "system for costing products, developing budgets, measuring performance, and valuing inventory."

O'Guin (1991)

ABC was developed as an alternative costing methodology by Robin Cooper and Robert Kaplan of the Harvard Business School during their research into product costing in the manufacturing industry (Cooper and Kaplan, 1998). Cooper and Kaplan recognised that, "the traditional costing model distorted product costs by assuming overhead costs are driven by the volume of goods produced via surrogates such as direct labour hours, machine hours or direct material expenditure. Thus products with low and high volume receive the same average overhead cost allocation per unit" (Cleary, 2000).

Cleary (2000) goes on to record that Cooper and Kaplan, "advocated analysis of the actual activities performed that incur the cost. The activities are linked to the cost objects that consume them and costs are therefore traced first to activities and then activity costs are allocated to cost objects via cost drivers". Thus contrary to traditional accounting, ABC breaks down overheads based on actual consumption of the resources by each activity or task thereby making a rational allocation of indirect costs (Howson and Mitchell, 1995).

Put simply, ABC acknowledges that the business of any organisation can be broken down into a number of discrete activities that often cross departmental boundaries. It costs a certain amount of money to perform each of these activities and the majority of the organisation's costs can easily be assigned to one, or in proportion to a number, of these specific activities. When the total cost for each activity has been established, this cost can then be distributed to the products or services (cost objects) in relation to their consumption of that activity. Thus, each product or service is only assigned costs for the activities that go into producing it, giving an accurate picture of each product or services true cost. Under ABC, costs that are not directly linked to the cost object (a course, for example) can be treated as business sustaining costs or idle costs (the vice-chancellor's committee, for example).



In the above example, academic staff are a resource of the university and their time is a cost to the university. Staff spend their time carrying out various activities, such as 'lesson planning'. If we take the percentage of each individual's time spent on 'lesson planning' and apply that same percentage to each of their salaries, we get the salary cost for the activity 'lesson planning'. The cost of the activity 'lesson planning' is then distributed to the courses (cost objects) using an appropriate cost driver – in this case number of lessons to be planned.

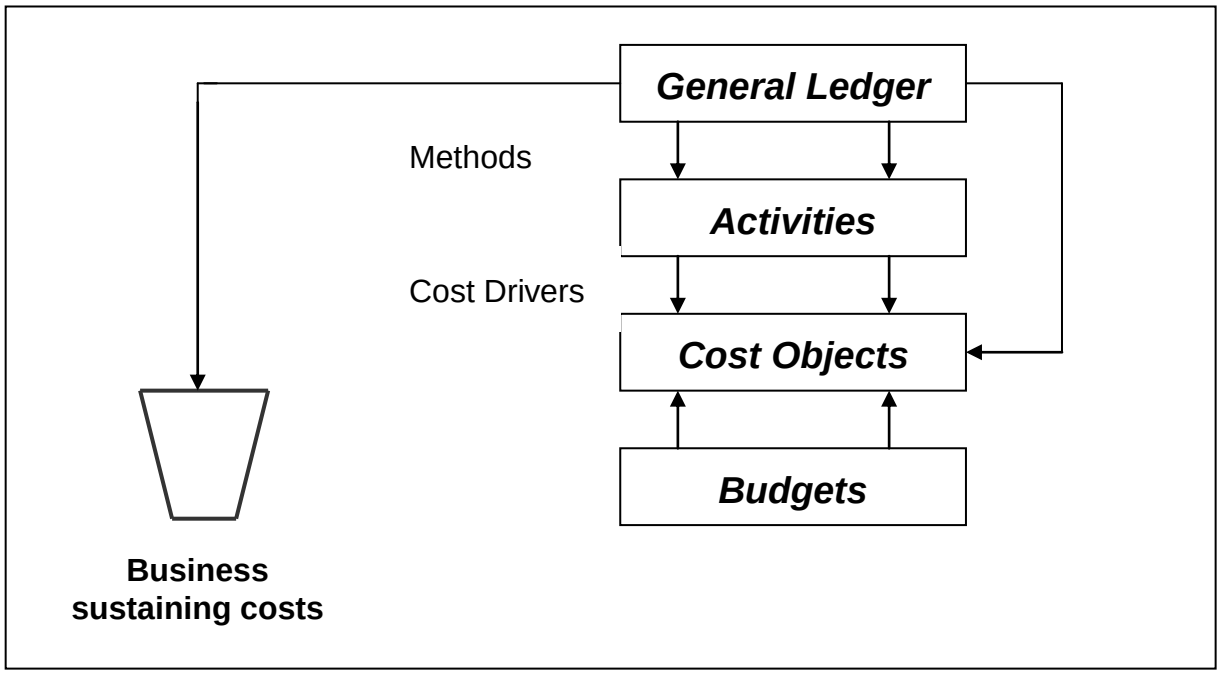
ABC derives the total cost of a cost object (a course, for example) by aggregating all of the costs incurred in the provision of that product or service. Basic questions ABC attempts to answer are:

- what activities are undertaken to provide a product or service?
- how often, and by whom, are activities performed?
- what resources are consumed when undertaking activities?
- how much does it cost to provide a product or service?
- what value-adding and non-value-adding activities are undertaken?

In providing answers to the above questions ABC facilitates decision-making (Cropper and Cook, 2000). ABC also has the potential to bring to the surface hidden costs that are

currently borne by the institution, staff and students in higher education establishments, as identified in CNL1. ABCs potential to reveal hidden costs lies in its ability to focus on activities and resources consumed in order to provide university services.

4.1 ABC in diagrammatic form



This diagram illustrates the process of ABC. Costs, taken from the General Ledger, are attributed directly to Cost Objects or to Activities using Methods, alternatively they are called Business Sustaining Costs when they cannot be realistically attributed to Activities or Cost Objects. Those which are attributed to Activities are then distributed to the Cost Objects using Cost Drivers. Budgets can then be fed into the model allowing comparisons between budgets and actual spending to take place. For a fuller explanation of terms please refer to the Glossary.

For example, at the University of Rother Bridge an ABC exercise is taking place. Costs are taken from the University's General Ledger and distributed to three places: to Activities (groups of tasks undertaken by staff in the University) using Methods (a Cost Driver operating in this place); directly to the Cost Objects (in this case, individual courses run by the University); or, finally, directly into the Business Sustaining Costs bucket (those costs, such as the Vice-Chancellor's salary, which can not realistically be attributed to the cost object), these costs are then evenly reallocated across all Cost Objects. Costs which the University has distributed to Activities are then attributed to the Cost Object using Cost Drivers (for example, the number of students applications per year per course). The University can now see how much its courses cost, they can also compare this to the budgeted information by feeding in this data at this stage.

4.2 The main ABC software suppliers

There are a number of ABC software suppliers, in this section we have provided their contact details should you wish to get in touch with them and also outlined our reasons for choosing the Armstrong Laing Group.

Baum Hart & Partners

19a High Street	Telephone and Fax 01453 792220
Stonehouse	
Stroud	E-mail bhp@baumhart.co.uk
Gloucestershire	World Wide Web
GL10 2NG	http://www.baumhart.co.uk

Baum Hart & Partners is a medium-sized company providing integrated software systems, consultancy and training services to the Public Sector.

ABC for HE is their comprehensive financial planning and management tool, designed specifically for the Higher Education sector. It is a user-friendly PC-based system created for the industry-standard Microsoft Access Database and complementing other financial control systems such as the General Ledger. It allows universities to meet UK Transparency and Accountability Review requirements and evaluate scenarios based on changing financial and non-financial factors. Financial and non-financial data can be imported to the modules and it is possible to export all data and output reports in a number of formats. A similar product, ABC for Education, has been designed specifically for the UK Further Education Sector.

The Baum Hart web site claims that in addition to "the prestigious Hong Kong University" and "the University of Canberra" a number of UK-based Universities and Colleges are currently using ABC for Education. However, we have contacted many of the HE organisations and our enquiries show that while purchasing the software implies interest and intent, it does not automatically imply use.

ABM Systems – ProDacapo

Telephone + 61 2 9908 8909	Email gaclarke@abmsystems.com
Fax + 61 2 9908 8919	World Wide Web
	http://www.abmsystems.com/

ABM Systems (based in Sydney, Australia) is a member of the ProDacapo worldwide firm of performance management specialists with offices throughout Europe and the Americas. Their web site states that, "we specialise in providing performance management solutions to companies, government and non-profit organisations. Our solutions integrate practical concepts to help people develop business plans, track performance, analyse costs and profits, and improve results". ProDacapo is a complete integrated performance management system, facilitating Activity Based Costing, Total Quality Management, Business Process Re-engineering, Performance Measurement & ISO 9000. ABM Systems claim to have a broad range of clients in Government, Manufacturing, Mining, Finance, Logistics and Service.

ABC Technologies Ltd. – Oros / Easy ABC Plus

UK Headquarters	Telephone 02392 230280
7 The Spinney	Fax 02392 268011
Parklands Business Park	
Forest Road	Email manager.uk@abctech.com
Denmead	
Hampshire	World Wide Web
PO7 6AR	http://www.abctech.com/

The ABC Technologies web site states that "ABC Technologies is, and has always been the leader in Activity-Based Costing and performance management software, services and solutions". The software solution offered by ABC Technologies is Oros® Analytics, which, according to the company web site, "seamlessly integrates activity-based costing/management (ABC/M), performance scorecarding as well as provides a bridge integration with SAP® inter-enterprise solutions". The web site also claims that there have been 4,300 installations of the Oros software in 73 countries, no examples of implementations within the traditional education sector are stated.

Armstrong Laing plc – Metify ABM

UK Headquarters	Telephone 01565 687000
25 King Street	Fax 01565 750030
Knutsford	Email info@armstrong-laing.co.uk
Cheshire	World Wide Web
WA16 6DW	http://www.armstronglaing.com/

The Armstrong Laing Group was established in 1990 providing support and consulting for various Management and Executive Information Systems. One year later they released their first activity based costing software solution. The web site states that, "Metify ABM is the cornerstone of activity-based management, pinpointing your most profitable customers, products, regions or channels, as well as uncovering the costs of individual business processes that may need to be improved in order to drive higher profit levels". The web site strongly promotes the concept that consultants will work with clients from proof-of-concept to full implementation highlighting the full scalability of the product. Although no examples of implementation in education exist, the web site states that 750 implementations have taken place worldwide; 19 case studies exist online including service companies and county councils. The software package also includes a bridge to incorporate existing information and an extensive reporting facility.

Our reasons for choosing Armstrong Laing were that the company:

- were willing to enter into true partnership;
- had experience in public sector;
- offered user friendly – approachable software;
- had no previous experience of implementing ABC in education and therefore were willing to test their standard industry methodology;
- were willing to help investigate and work necessary adaptations to the process to make it work in HE.

5. Literature Review

"Though not aimed at universities, and their activities, it [Activity Based Costing] nevertheless helps focus the attention of members of a university on what drives their costs, how the activities could be managed and how to identify which activities are the important ones or which ones could be reduced and so on."

Groves et al, in Berry (1994)

5.1 Introduction

This literature review expands the exercise undertaken during CNL1. It concentrates specifically on literature relating to ABC, both in general use and in university use specifically; the progress of the Transparency Review team and also the trials of other costings projects internationally.

It is generally accepted that better mechanisms for the costing of all activities are needed within Higher Education, HEFCE (1997); Cropper and Cook (2000); Turk (1992). Two main reasons are cited: there has been a gradual reduction in the government funding per student; and universities are now operating in a more competitive marketplace. The need to meet the increasing demand for places from students on ever-reducing, and already over-allocated, budgets, whilst maintaining quality, is stretching institutions sometimes beyond the limit (Ash and Bacsich, 2001).

In the past, universities have concentrated on financial accounting to the neglect of cost and management accounting. Financial control and monitoring has centred upon working within the funding received both at the institution and school level. As Meacham et al note in their report of a costing study undertaken at Charles Sturt University in Australia (2000):

> "Internally it is sometimes argued that the cost of educational provision always equals the funds available, with services being reduced or workloads increased to keep within cost. With increased private funding and entrepreneurial activities […] it is necessary from the tender stage onwards to have realistic knowledge of actual costs for the planned enterprise and on this basis develop a pricing policy that will be competitive, yet generate appropriate net income for the University."

Burnett et al (1994), offer two main purposes of costing information at Leeds Metropolitan University. Firstly, to give both appropriate and sufficiently accurate cost information which, when compared with revenue, establishes overall profitability; and secondly, to provide costing information enabling an analysis of course components in order to introduce a level of control and through comparability.

In an article entitled, "Activity-based cost management in the management of change", Clarke and Bellis-Jones (1996) argue that conventional management accounts "have been linked cynically to a journey for which the traveller:

- estimates the distance to be travelled and the time of arrival at the destination as well as at 11 intermediate landmarks, without identifying the route;
- is told after each landmark how far they were from where they thought they would be, but not where they went wrong, or how to avoid making the same mistake again;

- is obliged to decide the direction to go by looking in the rear view mirror."

5.2 The benefits of using ABC

The general literature gives a clear description of the benefits of ABC.

ABC provides more than just financial information

Traditional costing systems used by universities give a snapshot picture of the university's finances taking no account of the processes involved in producing goods or providing a service. Such accounting systems "cannot provide the information through which processes can be reengineered to reduce cost and increase quality" (Peebles and Antolovic, 1999). Although it is primarily a costing system, ABC also provides a great deal of non-financial information about the activities that are taking place.

ABC can improve quality

Clarke and Bellis-Jones (1996), Player (1997) and Gunasekaran (1999) all recognise that identification of, and focus upon, activities undertaken to provide a product or service can greatly improve the quality of that product or service by focusing the effort for improvement. In addition, Gordon and Charles (1997-8) note that, "activity-based costing can help not only with tighter financial management and resource allocations, but also with total quality management or continuing quality improvements (CQI), and with assessments and strategic planning. […] By highlighting the full and proper costs of an activity, ABC can help the CQI team [for example] understand the real costs of the activity and discover new efficiencies."

ABC enables more efficient use of resources

As King et al (1994) note, "ABC provides a focus on workload factors (cost drivers) which can provide feedback on the current use of resources and a basis for future budget predictions." For example, a UK assurance company examined its processes and realised that the cost of acquisition of new customers was much higher than anticipated and therefore realised the importance of customer retention and allocated resources appropriately (Clarke and Bellis-Jones, 1996).

ABC provides information for more informed decision making

ABC provides an accurate allocation of overhead costs based upon consumption. This information allows schools, faculties and departments to assess a range of opportunities, as recognised by Zimmerman (1979), "managers receiving such allocations are made aware that central overheads are not a free good, but represent a true consumption of resources. Decisions made without taking such costs into consideration, or made with costs that do not reflect this resource consumption, may result in better opportunities being forgone." Additionally, differential cost drivers can be used, highlighting different consumption levels of resources, such as the higher levels of support required by international students.

ABC uses two stages of cost drivers

First stage cost drivers (methods) are used to determine the amount of money in each 'activity cost pool'. Second stage cost drivers are used to determine the cost driver rate,

which can then be applied to the consumption rate to determine cost. As Gunasekaran et al (1999) note, the "application of non-volume-related second stage cost drivers in the allocation process of overhead costs makes the difference between ABC and unit-based TCS", [where TCS is a Traditional Costing System].

ABC offers a fairer system of overhead allocation

Innes and Mitchell (1990) found that managers considered overhead costs incurred using an ABC calculation to be more accurate than traditional absorption methods. Turney (1996, in Gunasekaran et al, 1999) notes that as a rule of thumb, overheads that exceed 15 percent of total costs may cause inaccuracies in a traditional cost system. Bourn (1994) points out that overheads can be seen as a form of internal taxation and used by management to control certain areas of the university or alter priorities. In addition, as Brimson (1991) notes, "presenting overhead cost in terms of activities which have given rise to it provides a framework which facilitates the analysis of the value of this type of expenditure to the organisation. This can be done by an assessment of whether or not the activity is value-added or non-value added."

ABC increases the accountability of central services

Bourn (1994) states that, "in those universities in which a Vice-Chancellery is able to top-slice some 40 plus per cent of funding, there is likely to be almost nothing that can be done to enforce any meaningful wider accountability by those in the central service units who spend it all." Central services are therefore not accountable to the people they serve. The University of Southampton chose ABC because they wanted a system "that would give budgetary groups more incentive to generate income and greater control over their own activities" (Goddard and Ooi, 1998).

ABC highlights cross-subsidisation

By allocating costs to activities, and subsequently to the cost objects that actually consume them, ABC highlights cross-subsidisation between courses and schools or faculties. Although not using full ABC, when talking about his institutions' experience of costing activities for the Transparency Review, Professor Graham Henderson from the University of Teeside stated that, "Departmental surpluses and deficits are now becoming evident. As institutions generally require heads of department to manage within their budgets, the cross-subsidies [are] now clearly visible" (J. M. Consulting, 2001).

ABC recognises the changing cost behaviour of different activities as they grow and mature

> "ABC might highlight changes in circumstances that have taken place gradually over time and of which administrators might not yet be cognizant".
>
> Granof et al (2000)

ABC enables the measurement of idle capacity

As the 1998 DETYA report notes, "one can view the entire ABC approach as giving managers insights about the existence, creation, and deployment of capacity, both used and unused."

ABC is good Public Relations

Gordon and Charles (1998) note that, "a growing number of people doubt that higher education has any clear sense of its costs by activity and believe that expenditures in higher education are out of control. ABC can be used to show that a college or university really does have a clear and detailed picture of its costs and is acting to reduce them. That is, activity-based costing is *prima facie* evidence of an institutions' concern about costs and for students and their parents."

ABC enables innovation

Contrary to popular belief, more detailed costing information may actually facilitate, not hinder, innovation. "Johnson and Kaplan (1987) argued that outdated management accounting information was an impediment to realising the benefits of innovation because the performance of individuals, production processes, organisational sub-units and firms in high technology environments could not be assessed accurately and evaluated appropriately" (Cleary, 2000).

ABC can be the basis of performance measurement

ABC provides a "direct link between strategic goals and operational realities" (Cleary, 2000).

ABC can highlight hidden costs

Hidden costs were the focus of the CNL1 study and the basis upon which ABC was recommended. King et al (1994) highlights this particularly well with an example from the printing services industry, "the activity of problem solving was found to be one of the highest costs. However, it had been 'hidden' among overheads in the conventional costing system and spread over all outputs on the basis of their labour content."

ABC is in line with the Transparency Review recommendations

The Transparency Review (section 5.5) requires all institutions to report on the costs of teaching, research and other activities by July 2001. The manual advocates using ABC principles; but expects the use of only a small number of robust cost drivers in the early stages as it recognises that many institutions will not have the timely data available to carry out more in-depth costing. This 'half-way-house' approach is not uncommon. Cropper and Cook (2000) note, "although the guidelines fall short of actually recommending an activity-based management approach, they do call for an analysis based on defining cost objectives (i.e. grouping costs by function, sub-division, contract, etc.), cost drivers, activities and outputs within a structured framework. They clearly point towards activity-based techniques." Cropper and Cook (2000)

5.3 The drawbacks of using ABC

As with the introduction of any new system there are always some disadvantages that should be considered before implementation.

ABC data collection is costly, time consuming and often difficult

Collecting the data for ABC can be incredibly time consuming and consequently very expensive. For example, Goddard and Ooi (1998) reported that the library data for the system at Southampton University took one person almost three months of effort to produce. Snyder and Davenport (1997) state that, "completely accurate cost usage information is often costly, if not impossible to obtain". The Australian National Audit Office (Cleary, 2000) stated that activity definition may become too detailed and the model may become too complex to be successfully manipulated or maintain; there is often an underestimation of the task of collecting activity driver data. In addition, employees are reluctant to participate in the costing activity because they fail to see the benefits to themselves, the company and their customers, leading to "failure to obtain accurate data on time and resources committed to activities because employees did not want to associate themselves with activities that did not add value from the customers' perspective" (Robinson, 1989 in Cobb et al, 1992).

It can be hard to determine appropriate cost drivers

Unfortunately, data may not be available on what is deemed to be the most appropriate cost driver for consumption of a particular activity, and so surrogates often have to be used. Where surrogates are used they often render the costings information inaccurate, as they are not strictly reflecting consumption but something with which it has a positive correlation. As Snyder and Davenport (1997) reflect, "the ideal relationship for a cost basis is causal, however, this is often difficult to establish. More often allocation is made with a basis that co-varies (i.e. has the same trends in usage) with overhead even if there is no direct causal linkage". Therefore, cost drivers should be as close as possible to the function which causes the consumption of costs. However, as Mitchell (1996) notes, a survey of higher education establishments found that the most common problem encountered when adopting ABC was getting agreement on drivers – establishing the compromise between accuracy (more analysis and more drivers) and simplicity (limiting the time and cost).

ABC is more complex than traditional costings systems

When Cropper and Cook (2000) carried out a survey of University Finance Officers they discovered that a number had rejected ABC because, although they understood the concept, they did not understand the full process involved. Snyder and Davenport (1997) note that, "managers to whom the costs are being applied, should, in particular, be able to follow how and why the costs originated" and be made aware of the benefits to them once the exercise is completed.

Establishing the trade-off between costs and benefits requires planning

It is practically impossible to calculate every single cost accurately. When implementing ABC, organisations have to establish just how accurate they need, and can afford, to be and it is important to use common sense (Antos, 1992).

The same ABC implementation can be perceived as successful or unsuccessful by different stakeholders

Malmi (1997) was involved in a 10-month project undertaking one of the first applications of ABC in Finland. The project set out to cost the products in a sub-unit of a much larger company. The costs derived from using ABC were very similar to those estimated by local level management using traditional overhead allocation methods, and consequently no action was taken on the results. Malmi showed that although the project was viewed as a waste of time by managers in the sub-unit, as it gave no new information, it was viewed as a success by senior management who were able to use the information to inform their strategic thinking. As Malmi (1997) points out, "ABC reduced the uncertainty inherent in informal techniques. The senior management was more confident that they were on the right track"

The outputs of ABC can be misused

Cooper (1990) states that, ABC only provides a starting point for estimating future financial implications and, possibly, as a basis for directing management's attention to particular product lines for detailed decision analysis. The focus given to the cost of activity outputs may lead to less emphasis being placed on the quality and timeliness to the overall detriment of the firm.

ABC may be perceived as the latest "fad"

Implementation may be considered a financial management "fad" and there could consequently be insufficient commitment from operational managers (identified by the Australian National Audit Office, in Cleary, 2000).

5.4 ABC in universities

How universities are different to industry

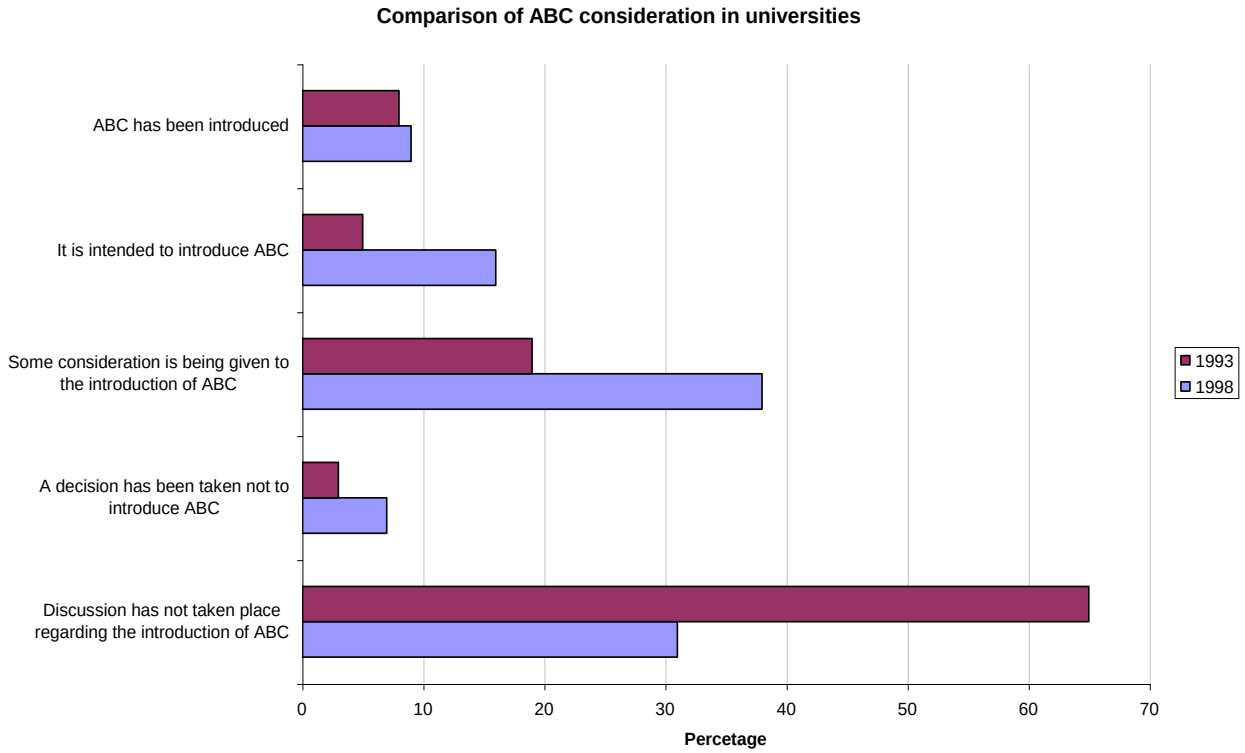
Many universities operate a devolved structure of management and budgets – having a number of subject or research departments, schools and faculties who make use of centralised services, but are able to carry on their own business with little or no interference. In such a devolved system each of these units is allocated a budget and the central finance department leaves it up to them to decide how they operate within that budget. This, as Mitchell (1996) suggests, is contrary to manufacturing, and most other service, industry:

> "this perhaps suggests an important distinction between universities and other organisations, in that the central finance function tends to treat schools as 'black boxes', with little or no view of the activities within these boxes. In a manufacturing organisation, the finance director would be very much concerned with product profitability and product decisions, for example receiving regular printouts with product-level detail. In a university, it would appear to be rare to find a finance director examining costs and revenues on a course by course basis."

Howson and Mitchell (1995) suggest therefore, that it should be devolved units such as schools or faculties that should be the focus for ABC in universities. In stark contrast to the higher education sector, within the manufacturing industry the finance department require

and analyse the costs of production and the make-up of the organisations' product portfolio and its pricing policy is directly influenced by this information.

Cropper and Cook (2000) surveyed University Finance Directors in 1993 and in 1998/9 to establish the trends in the use of ABC within universities. They discovered that there was a great deal more interest in 1998, though there had been little increase in actual usage over the period. Contrary to the conclusion of Howson and Mitchell (1995), 79% of those who had introduced or intended to introduce ABC considered a comprehensive, university-wide application to be the most appropriate way forward.



In their most recent survey Cropper and Cook (2000) also asked whether universities were using spreadsheet analysis (46%), specialist software from an external provider (46%) or specialist software written in-house (8%) to facilitate their ABC trial.

Granof et al (2000), when looking at how ABC can be applied in a single department of a major US institution of Higher Education, outline the unique characteristics of US universities and why they are not amenable to the constraints required by sound management and cost control:

- faculty members are free spirits;
- university administrators lack the authority conventionally accorded to managers – key decisions are made at lower levels of the organisation with only a passing consideration to cost implications;

- universities employ fund accounting systems designed primarily for compliance rather than for providing the information needed for effective management;
- budgets are likely to mirror funding accounting systems and are not typically tied to strategic plans or measurable outcomes;
- universities lack well defined objectives or measurable outcomes;
- the outputs of academic staff are interrelated and not clearly separable from each other;
- distinctions are blurred between inputs and outputs of producers and consumers, for example a PhD student partially employed as an RA who also does teaching;
- costs and revenues of a university may be integrally related, certain costs may not be incurred unless they are explicitly funded by outside bodies;
- capacity constraints of universities are not clearly discernible, for example academic staff regularly work over set their hours and take on new work seemingly at no extra cost to the institution.

Examples of ABC use in universities in a non-teaching context

In a thorough review of costs at *Anglia Polytechnic University*, with the assistance of Develin Partners, the University identified opportunities to either reduce or eliminate non-value-adding activities leading to a saving of £ 1.5 million. Twenty percent of all activities at the University were found to be non-value-adding and this had previously led to the quality of service to students suffering (Devlin & Partners, undated).

ABC has been used to examine the IT Services offered on *Bloomington Campus of Indiana-Purdue University* since 1995 (Peebles and Antolovic, 1999). They recognised that not all costs can be directly attributed to the services they offer (i.e. organisation sustaining activities such as the Vice President and his office) and they distributed these proportionally. They have successfully integrated ABC with a variety of tool-user surveys, the balanced scorecard, value chain analysis and total life cycle costing, that focus on quality, cost and value. Peebles and Antolovic (1999) claim that "knowledge of the real costs for each IT service – using the financial measures that are at the core of ABM – makes the choices among services rational and the improvement of services mandatory and measurable."

Groves et al (in Berry, 1994) outline the endeavours of the *University of Wales, Cardiff* to test the feasibility and acceptability of ABC. Staff time was allocated between 17 categories of activity using percentages, but the team soon recognised that if activity costing was to form the basic input data for planning, decision making, resource allocation, budgeting and budgetary control then the activities identified would have to be broken down further. Berry (1994) says this study emphasises the need to develop support among the academic community if the new costing systems are to be based on sensible activity measures.

One of the most difficult problems in HEIs is dealing with overheads. ABC can be complicated and results can difficult to achieve on a small scale. Realising this, the *University of Manchester's* solution was to use the language of cost drivers, cost pools and

cost objects rather that a fully implemented ABC system. An overhead allocation model, based upon the three simple drivers of students, staff and space, was developed enabling resource centres greater control of their affairs. According to Scarpens et al (in Berry, 1994) the system has proved to be more acceptable within the University than the top slicing 35% of all income. Gordon and Charles (1998) report the that, as in most universities, space at the University of Manchester was allocated by the central facilities unit and since each department wanted access to as much space as possible, space being a free good, there was deemed to be no surplus space in the University. However, once the above mentioned exercise had taken place, "all facilities under the control of a department were given an overhead cost allocation to the department's budget. Soon departments began releasing unused space to avoid overhead charges. Suddenly, the University of Manchester found itself with surplus space and facilities" (Gordon and Charles, 1998).

Southampton University developed an ABC system to allocate library services costs to faculties. When the ABC allocation of costs based on consumption was compared to the traditional apportionment based on student and staff numbers, there was little difference for some faculties but for others there was a considerable difference – up to 30% difference. Goddard and Ooi (1998) concluded that the ABC approach provides a model for a more economically rational allocation of library costs at the level of faculty, department and courses. They recognised that a faculty charged less overhead may then move into surplus and use that for other opportunities such as employing additional staff. This exercise is reported to have taken one person three months effort.

Examples of ABC use in universities in a teaching context

Bradshaw and Holmberg (1993) report that *Oxford Brookes University* adapted the SAPPS software being used in the NHS for ABC. The total teaching salary for each school was apportioned using the timetable and no account was taken of actual salary costs for individual members. Bradshaw and Holmberg (1993) argue that the academic schools' lecturing staff are a complete package, "…courses only exist and are able to be taught effectively because of the presence of a certain proportion of principal lecturers, readers, heads of schools etc., and to try and disaggregate the schools' teaching ability into individual lecturer costs is to miss the point about the role every member of staff plays in every course within the school."

An additional facet of this study was to look at the privately financed activities undertaken by the school:

> "Five years ago the privately financed activity of many universities was relatively small, meaning that the activity could be treated as marginal activity with very little effect on the overheads. Pressure on resources has meant, however, that privately funded activity had to be expanded to improve financial viability and it has now become such a substantial part of, certainly, this University's activity that the effect on overheads is significant and, and more importantly, regular enough to incorporate it into school and institutional planning processes, therefore, the budget. The conclusion that has to be drawn is that the best way to arrive at the real cost of an activity is to absorb all of the overheads over all of the activities as far as possible and let that real absorbed cost determine the 'bottom line' price."

The study team discovered that some privately funded work was not covering its costs, let alone contributing to any profit, and charges would have to rise if the activity was going to continue. They hoped that the system, in time, would help them find the optimum (in financial terms, at least) portfolio of courses in terms of both content and size (Bradshaw and Holmberg, 1993).

Whilst this article may have appeared groundbreaking in 1993, activities during the last eight years have made its conclusions now part of conventional wisdom.

5.5 Transparency Review

The Transparency Review methodology was prepared by J. M. Consulting (1999) on behalf of the Joint Costing and Pricing Steering Group (JCPSG). The initiative applies to all HE institutions and its introduction aims to make the sector more accountable for how it spends public funds. The Government;

> ".. wanted the dual support system for funding research unpicked so that it had clear information on exactly what was the funding gap for research, highlighted by Dearing and a number of other reports"
>
> Sanders (2001)

In order to collect information about how much time is spent on research activity, it was recognised that information on all activities would need to be examined. To ensure this is completed, funding councils ask each institution to report annually on the total gross cost for five distinct activities: research publicly funded; teaching (publicly funded; research non-publicly funded; teaching non-publicly funded and other.

Eight institutions initially piloted the Transparency Review process (seven research-intensive and Portsmouth), and Heriot Watt were already collecting staff time information; the rest of the sector was due to report in summer 2001. As with the initial implementation of ABC it is recognised that not all of the required cost driver data will be available;

> " …institutions will have to pay attention to the robustness of their cost drivers. We expect that some will find their data on space usage or on use of library and other learning resources is either out-of-date or not reliable (where they have it) and so they will need to do some additional work on this – probably in Year 2 of their implementation."
>
> J. M. Consulting (1999)

The Transparency Review is relevant to CNL2 because it can be viewed as the first stage of HE institutions adopting ABC. The Transparency Review guidelines and manuals sent to institutions use ABC terminology and advocate the use of a number of methods to collect staff activity data. When staff become used to providing, and management are in possession of, staff activity time data a major obstacle to conducting ABC analysis is overcome and all the benefits of ABC can be recognised.

> "The nine pilot institutions involved in the transparency review pilot have already been able to point to funding gaps in research, to underfunding by the research councils, government departments and private sponsors, to the extent to which

overseas and postgraduate fees are plugging these gaps, and support staff work to keep universities going."

Sanders (2001)

To ensure that everyone is reporting consistently, there are comprehensive manuals that provide answers about how to deal with the most complex questions. It is not within the scope of this project to examine the Transparency Review in detail, but information, and examples of best practice, can be found on the JCPSG web site at http://www.jcpsg.ac.uk/.

5.6 Analysis of other trials

In CNL1 we reported on a number of costings projects from across the world. Since the publication of CNL1 a number of these have undertaken trials and this section presents an overview of those case studies.

Department for Education, Training and Youth Affairs, Australia

In 1998, the Australian Department for Education, Training and Youth Affairs (DETYA) funded a project, which was undertaken with the assistance of Ernst and Young, to analyse the need for, and then develop, a costing methodology for use within Australian Higher Education. For a fuller summary of this project please refer to the CNL1 report or to the DETYA report itself.

The *University of Newcastle in Sydney* are following the DETYA methodology to look at the costs of IT and Library services across the University. They have chosen to do this using the EasyABC Plus software, from ABC Technologies, and two full-time project assistants working closely with Ernst and Young. The University anticipates that the three main benefits of using ABC will be: understanding costs; improving processes; and improving resource management.

The *Royal Melbourne Institute of Technology* (RMIT) reviewed costs associated with the use, and maintenance, of all property, buildings and grounds. These costs represented the largest non-salary component of RMIT's overhead costs. The case study notes that; "ABC costing places primary focus upon costing outputs rather than inputs, which is achieving greater prominence in government budget reforms. At present, some of the activities associated with building and premises costs cut across function departmental boundaries and are thus hidden within traditional accounting classifications" (DETYA and Ernst & Young, 2000). The Institute used ABC Technologies software following the Stage One Ernst & Young model.

Murdoch University looked at the total costs, and resources, associated with Finance and Human Resource (HR) activities across the University. Some Finance and HR activities had been devolved, consequently cutting across functional departmental boundaries, and were, therefore, hidden within traditional accounting classifications. Murdoch University used EasyABC Plus software (ABC Technologies) and Ernst & Young for guidance and support . As with RMIT, they recognised that they had achieved a high level overview and that more detailed activities, and more appropriate cost drivers, need to be developed over time.

Charles Sturt University examined their Faculty of Arts in partnership with Ernst & Young using the DETYA methodology. They focused on how the financial resources indicated in the General Ledger, for the second semester of 1998, were used in the activities of the Faculty. ProDacapo software (ABM Systems) provided the model which was capable of using available data inputs, carrying out complex analysis and producing a wide range of reports. Charles Sturt University say that, "inadequacies in available records and subsequent data collection, together with difficulties in identifying some cost drivers, have cast doubt on the actual costs of cost objects" (DETYA and Ernst & Young, 2000).

In addition to those case studies outlined above, Cleary (2000) reports that;

> "In the meantime a number of initiatives have taken place. The University of Wollongong is attempting a whole of university approach to activity based costing and the University of Queensland Library has analysed its services with activity based costing."

DETYA are now building upon the work done in conjunction with Ernst & Young with KPMG to determine the relative costs of teaching.

Technology Costing Methodology, United States of America

The "Technology Costing Methodology" (TCM) project, funded by the Fund for the Improvement of Postsecondary Education (FIPSE), began at the end of 1998. The project was a joint venture between the Western Cooperative for Educational Telecommunications, a unit of the Western Interstate Commission for Higher Education (WICHE), and the National Centre for Higher Education Management Systems (NCHEMS). For a fuller summary of the TCM Handbook please refer to the CNL1 report or to the Handbook itself.

Recently, a Case Book (NCHEMS, 2001) documenting the TCM trials has been published. The TCM Case Book covers the following trials:

- The Costs of ITV – *Eastern New Mexico University*
- An Analysis of Costs related to Mentoring Recruiting, Training and Support for Student Cohorts in 2+2 Distance Learning Initiative Course, Year 01 – *Florida State University*
- A Cost Analysis of the French Foreign Language Collaborative's On-line WebCT Course – *Georgia Board of Regents*
- Comparison of the Costs Associated with Compressed Video, Internet and F2F Instruction – *Northwestern State University*
- Receive Site Costs are Real – *San Juan College*
- Delivering an Undergraduate Course to a Local Community College: Delivering a Course Online and On Campus – *The University of Montana at Missoula*
- Indirect Costs of Technology Based Instruction – *University of New Mexico*

- The Value of Access – *University of Utah*
- The Costs of Satellite, EdNet, Online and F2F – *Utah State University at Logan*
- Comparing Course Costs Across Five Modalities – *Utah Valley State College*
- An English Composition Course Delivered Four Ways: F2F, Telecourse, WAOL and College-delivered Online – *Washington State Community and Technical College*
- The Costs of Developing Courses and Teaching Online – *Washington State University.*

Overall, most of the trial sites found that the exercise gave a "good starting point which raises many questions to study in the future" (*Eastern New Mexico University*). More specifically, *Florida State University* reported that, "studies, such as this TCM project, are extremely valuable in helping institutions that are plowing new ground assess the results of this work". *Northwestern State University* discovered that their ABC exercise allowed "participants to gain perspective about costs", while *Utah State University at Logan* found that "the process of evaluating costs and placing them in a useful format is a worthwhile venture" which "yields valuable information". *Washington State Community and Technical College* compared the cost of four different modes of delivery and found that the very act "of unbundling costs within activities, helped participants think about evaluating distance learning in new ways".

The *Georgia Board of Regents* compared the cost of a WebCT-facilitated French unit to a traditionally delivered French unit. They did not include indirect costs such as instruction, academic support, student services, instructional support, plant operations and maintenance. They found that the WebCT course cost $58,000 ($44,000 development costs) and the traditional classroom based course cost $9,000. They concluded that "not showing the development costs for traditional courses may be a flaw in the model".

The *University of Utah* found that, "attempts to carefully identify and describe the costs associated with a distance learning course, [were] an excellent starting point in the very difficult arena of providing decision makers with the information necessary to make the best and informed decisions possible". *San Juan College* also found that, "the data from other schools will allow us to make better and more informed decision when it comes to expanding our scope of course in a distance education arena".

Flashlight, United States of America

Flashlight is a programme of the Teaching, Learning, and Technology (TLT) Group, an affiliate of the American Association for Higher Education (AAHE). The programme was initially established as an Annenberg/CPB project in 1993. The programme provides training, consulting and evaluation tool kits – the latest of these is a "Cost Analysis Handbook". For a fuller summary of the Cost Analysis Handbook please refer to the CNL1 report or to the Handbook itself.

Three individual reports from the Case Studies that illustrate the guidelines for costing are given in the Flashlight Cost Analysis Handbook.

The first, by the *George Mason University*, was undertaken as part of a longer term Andrew W. Mellon Foundation Grant and aimed to address the critical question; "Can

Information Technology really reduce the unit costs of college training?" Two different, but complementary costing, methodologies were chosen – Activity Based Costing as recommended by the Flashlight Handbook and Micro-Costing as discussed by Jenny (1996) – thus a hybrid costing model was trialled during the project. The project team also used an induced course load matrix to access student-related data. The hybrid methodology allowed the team to analyse student course taking behaviour, academic staff workloads, accommodation costs, support costs, activity based costs and the institutional revenue stream. The pilot established that costing is a much wider issue than just straight financial concerns, much more time was needed to decide upon an appropriate approach and scope for the study. In addition this study found that it was essential to have accurate, timely and detailed information.

The second of the case studies outlines a pilot project conducted at the *Washington State University*, where the research team aimed to identify which approach for developing online learning materials was the most cost-effective model for integrating technology into the institution. The University already had a comprehensive non-traditional course provision and so the costing information was not about whether or not to undertaken an activity but rather how to conduct present activities in a more cost-effective manner. The case study report provides a very rich illustration of how the Flashlight Cost Analysis Handbook can be used. The team found that by building their economic model a considerable amount of useful information was produced but using ABC did not produce what is commonly called a 'mudslide' quantity of data. The project team built up a small activity dictionary and used activity interviews to question academics about their time distribution. The study concludes with a discussion about how difficult it was to get academic, and other institutional, staff involved in the project. But it does note that the information gathered was a useful component in decision making and also that the exercise highlighted other areas of discussion previously not considered.

The final case study was undertaken by the *Rochester Institute of Technology* and aimed to establish a picture of the true costs associated with three types of courses – traditional site based courses; site based courses using technology; and technology based courses that students undertook without attending the Institution. The study team looked at eight courses that covered this range of options that were already operating, thus only looking at comparable ongoing costs rather than incomparable set-up costs. At an early stage, this study notes the importance of establishing a common methodology for activities to avoid confusion within the team and the misallocation of data during analysis. The team identified six main activities that together delivered a course – preparation, presentation, interaction, assessment, practice/application, and evaluation – and within each of these the team identified 10 sub tasks. The RIT team also used an interview technique to collect data from staff about time, which the team later stated as a not particularly accurate methodology. To conclude, the study team found that by using ABC they had a much better understanding of the costs that are incurred whilst running a course for students but that a wider, more accurate study would be needed to provide any truly conclusive data.

Canada and other countries

Apart from the UK, US and Australia, and a small amount of work in Canada, no centrally co-ordinated costings work in the educational field appears to be taking place.

5.7 Summary of points

At present, very little of value is being reported about the implementation of ABC in UK universities; we suspect that the literature under-reports the actual level of activity. We also suspect that many more institutions are now considering ABC since the Cropper and Cook survey (2000), due to the advent of the Transparency Review reporting requirements.

In Australia, DETYA have developed an ABC methodology that has recently been trialled in three institutions. DETYA hope that ABC will be used throughout the sector in the near future. When data collection systems are in place the process appears to work well, but in most cases there is still much work to be done, in the area of data collection and cost driver identification, to simplify this exercise.

The United States appears to have had a head start on the rest of the world in terms of costing education. Most American studies of this nature started three or four years ago and have consequently become quite developed and in-depth. The US is also much further ahead than the UK in terms of e-learning and so can make better comparisons between types of learning, and indeed different types of e-learning.

The main conclusion to be drawn from the literature is that the real issues have still to be addressed. Studies looking at the cost of (for example) gardening in universities using ABC miss the point and result in a lack of credibility for the methodology. Most people agree that ABC is an excellent approach for recognising costs; especially costs normally hidden in overheads and not applied to the methods of teaching and learning that they relate to. However, for ABC to be successful in educational establishments a change in culture is required – and changes in culture take time or require external pressure.

6. Key Issues

"...given effectively static funding, the only way that college or university IT organisations can offer either increased levels of services or new services is to eliminate some current services or to reduce the unit costs of those services provided currently. Measurement of the cost and quality of these services is a necessary first step."

Peebles and Antolovic (1999)

During CNL1 a number of key issues were unearthed and needed to be resolved during CNL2. These issues were initially outlined in a paper which supported a workshop run at the Networked Learning 2000 conference at Lancaster University in April 2000, all sections entitled 'Presentation of the issue' have been lifted directly from that paper. After this event a number of the issues were discussed on the cost-of-networked-learning listserv and at formal and informal gatherings during the project.

The team would like to thank all the members of the listserv, participants of workshops and other colleagues who have contributed to this debate.

6.1 Why should we cost at all?

Presentation of the issue

The average person could be wondering where the sudden interest in costing has sprung from. On one hand the Funding Council wants us to record, in a transparent manner, how we spend our research grants; and on the other we are being asked how much it costs to run our courses. This interest in costing is not a recent obsession; indeed costing has been going on quietly for a great number of years, especially by providers of distance education. Its sudden breakthrough to the more conventional education system has been brought about by competition. Higher Education is no longer solely the remit of universities, courses are being offered by virtual universities, the non-educational sector (corporate universities) and institutions abroad. In order to continue to be a supplier of higher education each institution is going to need to streamline its operations to reach a greater, and more diverse, body of students with high quality education whilst remaining within budget. The ability to do this is dependent on the assimilation of accurate and timely costing information.

Summary of the discussion

Contributors to this discussion seemed to agree fundamentally that 'not costing' was not an issue. Indeed most participants were in general agreement that costing was necessary in the changing education sector. One respondent noted that in order to be able to take advantage of the possibilities these changes are offering us then we need to have a better understanding of the cost implication involved. This point was extended by another commentator, "understanding the cost of the activities we pursue is likely to make us better able to pursue them intelligently". This respondent went on to say that the higher education sector suffers from 'short-termism' in its approach to planning and that full costing should lead institutions to consider whether they can afford to maintain activities after the initial funding regime has expired.

Much of the discussion centred on the subject of new alliances, such as alliances between educational providers and between commercial companies and universities, and the need for "a clear financial model that we can use as a basis for negotiations with these companies". It was noted at the time that this extended to the new e-university venture.

One area of the argument was put simply as, "we are using either public or private money… there is a moral imperative not to waste it."

It was noted that the "development of flexible and distance learning is based on unhealthy financial grounds" and also that "very little of any HE or training is costed (about 5%)". Participants in the discussion agreed that costing must be a transparent exercise that is centred on providing more cost-effective education. Exploring the cost of delivery per student and the effectiveness of delivery per student, refining materials and processes based on this information and some form of comparison was agreed to be essential to determining cost-effectiveness.

One participant noted that, "the purpose of costing is to use resources to best effect and deliver more and better education to more students. The continuing Government squeeze on funding will not go away. Whether that translates into a demand for costing in individual institutions depends on the local management style. And, likewise, whether costing is worthwhile depends on whether the local decision-making process will take some notice."

The same participant went on to say, "an interesting question is why we are generally reluctant to cost, and even more reluctant to do it properly. Is much of the reluctance to do with strongly held views of education as a process and value rather than a product? Is there a consequent justified fear that much-loved processes and values will be compromised on grounds of cost? Is there a legitimate concern that costing by definition assumes hard products and outcomes, and therefore tends to falsify the softer – but important – values of education?"

Two things were made very clear during this discussion – that costing should not be the only factor taken into account when decision-making and that costing may well lead to a distorted view of what is going on within an institution. It was obvious that participants wanted costing to be part of an overhaul in the decision making process – one that leads to more informed decisions being made.

6.2 Who should do the costing?

Presentation of the issue

Once we have decided that, regardless of whether we want to cost or not, that it has to be done, which poor soul is going to do it? Some might suggest this should be the role of the finance department, or that everyone should play their part and someone uninvolved should compute the final figures. Obviously everyone will have to play their part if Activity-Based Costing is adopted but whoever holds these parts together will need to be a highly skilled and dextrous individual. Not only will they need to have their personal Babel fish working at all times but they will also need the patience and understanding of a trained negotiator. They will need to remain independent, so as not to bias the figures, but involved enough to understand what they mean.

Summary of the discussion

Most participants agreed generally that to a certain extent we were all responsible for collecting costing data. The group then split in two, one half suggesting that this should always be the case as all academic staff need to be able to answer questions about resource allocation within their own courses, while others suggested that data collection, especially when ABC is used, should be the responsibility of all but then the data needs to feed up to a central team, possibly within the existing finance department, for processing and reporting.

When consensus on this issue appeared easy to reach someone noted, "but they need to know how."

6.3 The cost of costing

Presentation of the issue

One of the growing concerns about these costing exercises is how much undertaking them is going to cost. We could say that the institution undertakes costing in some form already, and that Activity-Based Costing is an extension of, or better still a replacement to, that existing system. Luckily some institutions are coming up to the time when they would naturally replace their existing systems but others have just invested heavily in new software. In addition, someone is going to have to pay for the retraining of Finance Directors and their staff. And then there is the issue of non-financial disturbances, such as those any serious change will bring about.

Summary of the discussion

This issue has not been directly discussed during the course of the CNL2 project. One colleague did point out that the HEFCE funded Transparency Review offers minimal financial assistance on a request basis and there is a certain argument that says that costing courses using ABC could give the Funding Council a lot of useful information and, therefore, should be supported in part by them. It is generally believed that once institutions realise the potential of ABC / M as management tools that they will want to invest some money to reap in the benefits. It is very clear that if ABC is required by the Funding Council then they should fund the venture, while if it is solely for the benefit of the institution itself then funding should be internal.

6.4 What is the cost of having done the costing?

Presentation of the issue

The cost of having done the costing is a serious issue – once we have reallocated the hidden or unrecorded costs to the correct budgets and decided what to do with personally incurred costs, how are we going to pay the bills? The direct cost of providing education might go down, but the cost of keeping the cafeteria open may increase to the extent where serious thought has to be given to the viability of its existence. Perhaps the cost of everything will go up, or down. How will these changes be dealt with and by whom? One thing is certain, more accurate costing information will highlight successful and struggling academic programmes, hopefully the decisions whether to continue with them will be based on more than just financial concerns.

Summary of the discussion

It was agreed very early in this discussion that the cost of undertaking a costing exercise was not a reasonable argument against costing. As one participant said, "we really don't have a choice already if we want to compete in future markets". However, it is essential that costing exercises are worthwhile and cost-effective in themselves.

A number of participants felt very strongly that guidelines should be provided about what needs to be taken into account when making decisions to remind people, or at least encourage them, not to make decisions based on costing information alone.

6.5 Cost effectiveness / benefits

Presentation of the issue

Despite a growing body of work about costing networked learning, the debate about the presumed efficiency, effectiveness and additional benefits (or not as the case may be) of such activities is rife. Without concrete evidence either way costing is going to remain a cold and non-academic subject. There is a genuine need to develop a methodology to measure effectiveness, as a recent report states "while the debate [about effectiveness] will continue, it is too late to turn back. Recent history suggests that both the variety of offerings and the number of individuals availing themselves of these alternative forms of learning will not only increase but will increase dramatically. The alternatives are entering – and in some circumstances, becoming – the mainstream" (NCHEMS, 2001). In addition, institutions are concerned that there is not an accepted uniform methodology to explain how a move towards networked learning could benefit institutions in both the long and short term.

Summary of the discussion

This issue was not discussed formally, but informal views on this issue remain fairly visible. There is still no data on the effectiveness or benefits of any type of learning that we, as a sector, are willing to call conclusive. The need for this data is increasing steadily, but in the first instance we must establish a methodology that decision-makers are willing to put faith in; this must be a centrally funded initiative.

6.6 Pedagogical basis

Presentation of the issue

Our research shows that one barrier stopping institutions moving towards networked learning is a lack of pedagogical evidence to support such a move. Is the quality of education better when using networked learning than when not and how can this be measured? Indeed should we be concerned with this issue at all or is the evidence in existence already?

Summary of the discussion

There is still a lack of pedagogical evidence to support a move towards Networked Learning; discussion on this issue ventured no further than berating that fact.

6.7 Staff-borne costs [academic]

Presentation of the issue

The recognition of personally incurred costs, by staff and students, was a major breakthrough for the "Costs of Networked Learning" study. A large majority of hidden and unrecorded costs are absorbed by staff and students (students are covered separately below). What about the expenses we incur whilst away from home on business that are not reimbursed by the institution? These include entertaining potential research partners, evenings out and sight-seeing whilst in a foreign country, calls home to wish the kids good-night – expenses that we would not have incurred had we not been away on business. How many of us own a home PC and use it for work purposes, be it fairly infrequently or every weekend? What about our time, working outside of the average 9.00-5.30 day? Is an extra hour or two, especially when up against a deadline, reasonable? What if it coincides with your partner's birthday; or extends to two or three hours every day and whole days on the weekend, just to keep up with the flow of work?

Summary of the discussion

At first a number of participants pointed out that to a certain extent academic staff have always taken work home to complete, such as marking assignments and keeping up to date with their subject area; but also that since the advent of home computing this has become more expected and more extensive. Participants were afraid that with the move towards greater networked learning that this trend would increase steadily.

However, most of this discussion centred around the fact that many participants believed that staff were having to bear these costs due to bad management decisions rather than because they always have done so in the past. There seemed to be a clear indication that there was a point up to which staff were willing to put in extra time and so on, but that recently the line had been crossed. Staff feel it is now silently expected rather than personal choice – this means that they are resentful and treat it as an imposition.

It was decided that the first step towards resolving this situation was to fully appreciate the actual tasks undertaken by staff and their workload. A number of participants noted that their institutions had started to look at workload issues but in most cases these preliminary investigations did no more than guess workloads based on ideals, or only looked at teaching time, for example. One participant noted that while extra time and effort remained an 'underground activity' it would be 'difficult to implement any helpful programmes' or 'push for strategic allocation of funds'. It was, however, considered most important that "the assessment exercise should not put under pressure those members of staff who do not demonstrate their love for the job by working extra hours".

It was clear from participants that they would support a move which looked at the activities that they actually undertook as long as it resulted in changes to workloads rather than a vindictive exercise in which they came out worse off.

Participants said they would be willing to undertake a time recording exercise if it fed into realistic planning which made better use of both time and resources and also addressed common problems of wastage. One participant summed this issue up particularly well, "I think it's less an issue of trying to get our institutions to provide recompense than to try and ensure that realistic policy decisions are made based on the facts".

6.8 Division of academic time

Presentation of the issue

When contemplating the move to Activity-Based Costing a number of issues arise about what activities the institution is involved in, and within that what activities academic staff are involved in. The 1997 Joint Funding Councils report stated that academic time broke into categories of teaching (undergraduate and postgraduate levels), research (grants, contracts and general research), other service activities (short courses and consultancy work), department administration (for some reason including services to professional bodies), and faculty and university administration. Three years on with the introduction of technology on a wide-scale basis are the boundaries so clear or do we need a new, more sophisticated breakdown?

Summary of the discussion

This issue was not discussed during the project, but thinking on the issue has reached a point of consensus across the sector.

6.9 Recording of academic time

Presentation of the issue

Time-sheets have generally been regarded as anathema to academic staff. But if Activity-Based Costing is adopted some form of time recording mechanism is to be expected. Time-sheets are the usual method for collecting this data, and however hated they are regularly used by a great number of people working on European funded projects – but are they really an accurate measure of time spent on activities? The aforementioned Joint Funding Council report suggested four methods: use information from the department's workload planning systems; ask programme managers to estimate staff time spent on each activity; conduct a survey of academic staff to estimate the proportion of time they spend on each activity; conduct a diary or time-sheet exercise, as a one-off or ongoing project. The more recent JCPSG report (1999) had similar ideas, it states that methods of allocating staff time can be split roughly into the following approaches: estimation; proxies; structured interviews and workshops; annual retrospective time allocation in percentages; in-year retrospective time allocations (about 3-6 times per annum); and sampling that meets statistical levels of precision (ie diaries).

Summary of the discussion

Surprisingly, this area of discussion did not rouse much interest at all. The general consensus seemed to be that no method of recording time was going to be met amicably or accurately represent the complex range of tasks done by academics. Another participant noted that much work needed to be done to overcome the stigma attached to recording time and sufficient assurances needed to be given regarding the use of this sensitive information. After the team outlined their approach using the activity workshop, activity dictionaries and follow-up interviews, participants agreed that ABC could force you to give your work more consideration and the exercise would provide a balanced view from a number of different staff engaged in each activity.

6.10 Division of the course lifecycle

Presentation of the issue

The 'Costs of Networked Learning' project team realised that in order for the costing methodology to resonate with academic staff the framework needed to revolve, at least in part, around the core activity of teaching. After a number of false starts, and a great deal of testing, a model with three phases was proposed. Cyclically it revolves around the phases of planning and development, production and delivery, and maintenance and evaluation. The model encompasses students, staff and the institution as the main stakeholders, and expects that activities such as strategic planning and facilities management take place outside what is primarily a course lifecycle model.

Summary of the discussion

The Life Cycle Model was not discussed formally during this phase of the project but has generated much informal discussion since the publication of the CNL1 report. The Model has been adopted by a number of leading academics in the sector and is generally regarded as a useful planning tool.

6.11 Student-borne costs

Presentation of the issue

Students have been bearing part of the cost of education for years, just like staff have been marking assignments on the dining room table. We believe these costs are rising as we progress into more networked learning, both network-supported 'conventional' courses and whole courses 'on the Net'. However, students are driving for networked learning: our CNL1 research showed that although students believe that networked learning is increasing the cost of their education, they also believe that this is offset by a general view that it is also enhancing their experiences, making learning more enjoyable and profitable.

Summary of the discussion

The discussion on this issue was minimal as participants quite quickly agreed that students should not be recompensed for learning costs by Universities but that extra costs incurred by students should be taken into account by course planners as certain factors (such as reaching a particular group of students from an underprivileged area) will determine whether or not, or to what extent, technology should be used.

6.12 Quality management

Presentation of the issue

During our research, concerns about the quality of networked learning materials and a lack of standards against which quality could be measured were said to be two issues restricting the introduction of networked learning. In addition, institutions also felt that networked learning, and similar initiatives, was uncharted territory; institutions are unsure about the structure and status of such activities.

Summary of the discussion

'Quality' of the educational process is an issue with multiple facets. There is the facet most normally thought of as 'quality', the domain of the QAA and agencies such as WICHE in the US. But there is the issue of technical quality, often articulated in terms of 'standards' for learning material and systems. This is dealt with by such agencies as IMS (a group of vendors originating in the US), the PROMETEUS group in Europe, and an IEEE committee. This work is slowly generating agreed standards, along with a great deal of controversy.

6.13 Universality

Presentation of the issue

Collaboration between internal faculties and departments, different institutions, and on a multinational basis, is becoming increasingly common for teaching as well as research. At present in any such collaboration each partner is likely to have different management, planning and financial accounting approaches, leading to difficulties in collaboration. Thus there is a great need for a uniform planning and costing methodology so that such collaborations can thrive and that organisations can negotiate with each other using a common vocabulary. Only in that way can misunderstandings be avoided. In summary, a universal approach is needed in all multi-faculty, multi-institution and multi-national research and teaching ventures.

Summary of the discussion

This issue was not discussed, either formally or informally.

7. ABC Trial

"The primary aim of the new system is not to create an elegant and technically robust solution, but it is to provide a solution that will change behaviour of management to improve the performance of business."

Gunasekaran et al (1999)

7.1 Introduction

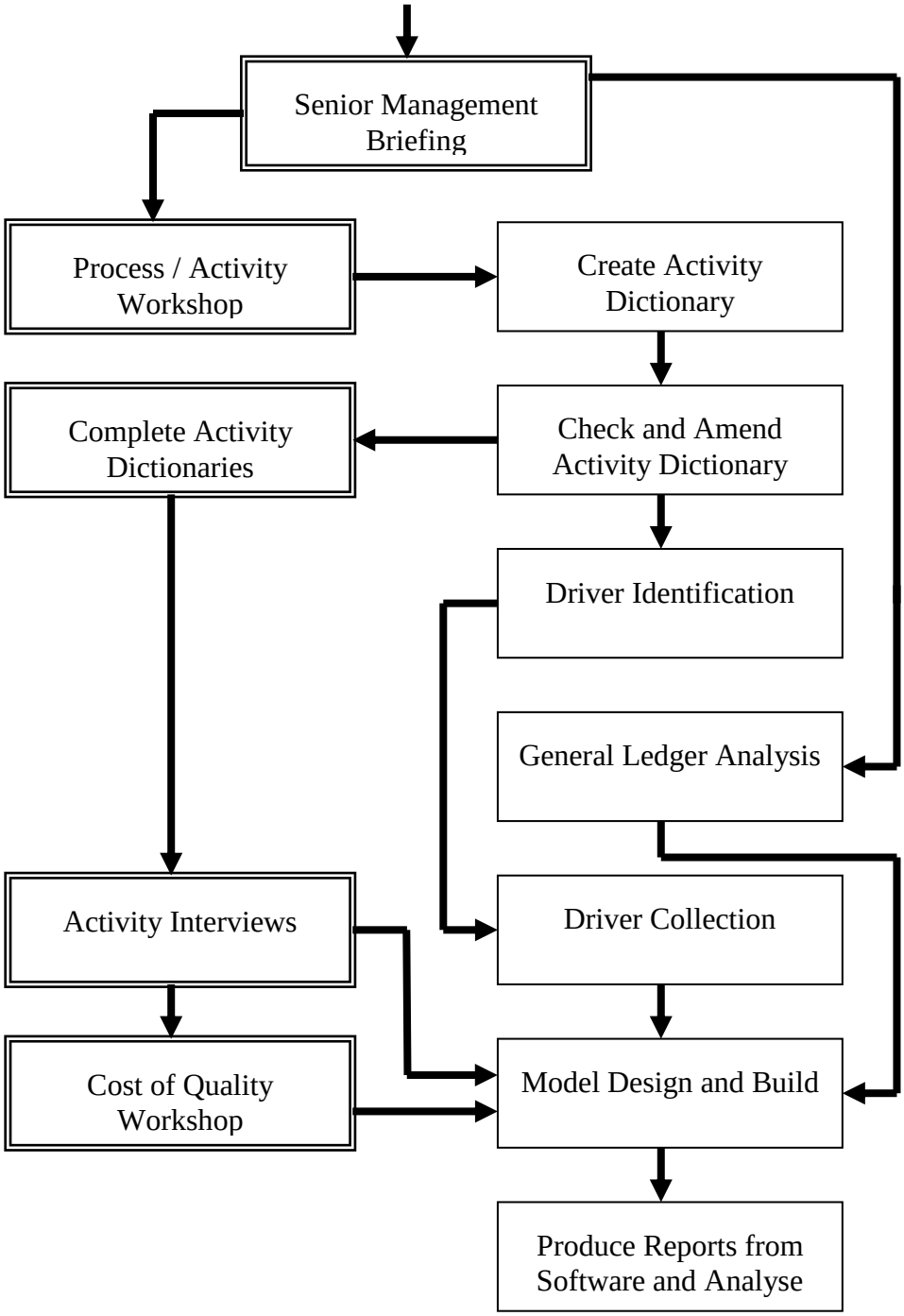
This chapter covers the experiences of the CNL2 team in piloting ABC in the School of Computing and Management Sciences at Sheffield Hallam University. This was done following, as closely as possible, the methodology provided by our Armstrong Laing Group consultant. This section does not outline in detail what the team undertook to accomplish each exercise, merely the reaction of the study participants and lessons we learnt by taking part. The Handbook accompanying this report does cover, as extensively as possible, the individual tasks undertaken within each exercise.

Sheffield Hallam University (SHU) started life in 1843, as the Sheffield School of Design. In 1969, it merged with the city's College of Technology to form Sheffield Polytechnic. In 1976, the Polytechnic was renamed Sheffield City Polytechnic when it absorbed the city's two teacher training colleges and finally, in 1992, the City Polytechnic earned the right to the title of university and to degree-awarding powers and became Sheffield Hallam University. Today, the University offers over 400 courses at three central sites in Sheffield.

Within SHU, the School of Computing and Management Sciences (CMS) is a lively community of some 100 academics, 50 support staff, 1800 undergraduate students and 600 postgraduate students. Undergraduate courses in IT, Statistics and Business Process Management are popular with students and industry. The School has an international portfolio with 200 students studying through distance learning overseas, and an annual non-HEFCE income of £1.5 million.

The University operates a devolved budgeting system, allocating HEFCE and other income to academic schools using a unit income distribution model (UIDM) after funding for central services has been top-sliced.

The following chart should give an adequate illustration of the process undertaken by the team (boxes with a double outline indicate exercises which require the involvement of people outside the study team):



Flow Chart to show the Activity Based Costing Methodology trialled by the CNL2 team

7.2 Senior management briefing

The Senior Management Briefing really kick-starts this whole process bringing together all of the key stakeholders, the project team and the consultants. At this meeting the reasoning behind the project is outlined, key stages and activities explained and everyone is made aware of their expected contribution and the potential outcomes of the exercise.

At SHU three senior management briefings were undertaken – the School of Computing and Management Sciences, the School of Cultural Studies and the central computing service, Corporate Information Services. The Briefings were all delivered by our consultant from the Armstrong Laing Group. We chose to do this for a number of reasons:

- the consultant could reassure senior managers that ABC does work in a variety of organisations, and provide recognised examples, such as DHL, and Glasgow City Council;

- the consultant could authoritatively answer any complicated questions that senior managers may pose – at that time, the CNL2 team had no practical experience of implementing ABC and only a limited understanding of the potential difficulties;

- the consultant could reassure senior managers that everyone's first reaction is to say that their job is too complicated to be analysed in such a way and explain how this will be done;

- the consultant also had a never-ending, easy-to-understand supply of practical examples of how ABC has helped organisations understand how their income is spent, what aspects of their business add value and provided data to allow senior managers to make more informed business decisions.

Overall, all three Briefings went exceedingly well and, although attendance was not high, interest and enthusiasm were. We anticipated serious resistance as most senior managers within the University are academics, but it was clear that they understood the concept of ABC and thought that, if we could get the required data, the outcomes would be very interesting. The only reservations senior managers alluded to were those connected to the amount and nature of the data we needed to collect. Having already undertaken a review of the literature, it was clear that this was not an unusual reaction and one, that with top management support, could be overcome. We showed examples of where ABC had been successfully implemented in the National Health Service to allay these concerns.

The workshop gave senior managers the opportunity to ask a number of questions about the project, ABC and their own potential involvement. It also allowed participants to see the links between this ABC pilot and other SHU initiatives, such as EFQM. Unfortunately, at this stage the School of Cultural Studies and the central computing service felt it necessary to pull out of the ABC trial. Both were very enthusiastic about the concept and potential benefits of ABC but claimed timing and the demands of current initiatives to be overwhelming. Both departments asked to be kept fully informed and welcomed the opportunity to participate in future work.

With hindsight, we would have run the Senior Management Briefing at the end, or as part, of a regular management meeting. This was not possible during this trial due to the

unfortunate timing of the project; we believe, this would reinforce the fact that the School Head is fully behind the trial and that most, if not all, of the senior managers would be involved from the start – enthusiasm and commitment would then trickle down to staff within the School.

7.3 Process / activity workshop

A workshop, usually taking no more than two days, bringing together representatives of all types of employees within the entity being costed (for ease we will refer to this entity throughout as the 'School'): academics, managers, administrators, technical staff and so on. The exercise attempts to list the processes and activities undertaken by staff within the School.

At SHU, this exercise took two longish afternoons with about ten participants, and the project team. We pooled a group of people together that covered most areas of School operation but found it very difficult to get participants to attend for the full duration of the exercise, due to teaching commitments, other meetings and responsibilities. Fortunately, within the CNL2 team a number of positions across the University had been held, allowing us to attend the session having already completed an initial brainstorm to get people started. We also found it did not disrupt the exercise to have additional people popping in and out when they were able to do so, as long as they had a general understanding of what was going on. We hope that by using the SHU Process / Activity List, an appendix to this report and in the Handbook, other people undertaking this exercise will have a starting point enabling more indepth discussions to take place or for the exercise to be completed in less time.

Once the exercise was understood, everybody got very involved and excited. This exercise turned out to be a great team-building experience giving participants an insight into what colleagues do and the opportunity to question why.

If we had had more time it would have been useful to further investigate the things that can go wrong and non-value adding activities; include more activities that take up time but are the result of other activities not working perfectly (internal or external failure).

It is important to include these activities, as these are the ones that can be further investigated for improvement if it is shown that they carry significant costs.

7.4 Create activity dictionary

The Activity Dictionary is basically a list of all the activities undertaken by staff in the School under the process headings identified during the Process / Activity Workshop. The Activity Dictionary is also the primary device for collecting data about how staff within the School spend their time.

This exercise simply involved typing up all the processes and activities cited by participants in the Process / Activity Workshop into a proforma provided by our consultant. We did find it necessary to explore some areas in more detail during this phase of the process due to gaps and issues of clarity and consistency.

7.5 Check and amend activity dictionary

The draft Activity Dictionary is sent out to all participants who attended the Process / Activity Workshop to check that it is an accurate interpretation of the activities of the School. At this stage additions and clarifications can be undertaken.

Again, another simple exercise given the scale of the SHU trial. The completed Activity Dictionary was sent, by email, to participants of the workshop who were asked to check whether it was an accurate representation of the workshop proceedings. We found that doing this over a coffee with a member of the implementation team resulted in a much higher rate of return and involvement.

7.6 Complete activity dictionary

The list of processes and activities has now become the Activity Dictionary, the main information-gathering tool in terms of recording time and tasks undertaken. The Activity Dictionary should ideally be completed by each member of staff within the School.

It would be dishonest to say that this exercise was easy; required extensive persuasion and perseverance skills from the CNL2 team. In industry, a line manager or section head will complete the Activity Dictionary on behalf of his or her team, resulting in each individual member of the organisation being recorded without having to complete the Activity Dictionary themselves. The line management structure within the University on the academic side is not as simple; therefore, we chose to use a sample of academic staff to represent the whole. For administrative and technical support we followed the industry-standard procedure. While the administrative and technical staff had no qualms about completing the Dictionary for the CNL2 team, a number of the selected academic representatives refused outright, despite firm assurances that the exercise would be anonymous outside of the CNL2 team. A similarly sized group of academics understood the concept and were willing to participate but had other priorities. Consequently, a much smaller number of Activity Dictionaries were completed that anticipated.

We found it most appropriate to talk people through completing their Activity Dictionaries in person giving them the opportunity to ask questions. In reality, very few academics completed their Activity Dictionaries in full before their Activity Interview.

7.7 Driver identification

A simple but essential exercise to identify individual drivers of costs present within the School.

This exercise took the SHU CNL2 team approximately one afternoon with the assistance of our ABC consultant. Each activity was considered in turn and an appropriate cost driver chosen to drive the costs firstly to the activities from the General Ledger and then to both types of cost object (i.e. the courses and the student types).

7.8 General ledger analysis

The Armstrong Laing ABM software that the SHU pilot team opted to use was able to suck information directly from the existing general ledger system used within the University.

Obviously, if you chose a different software supplier then this section may well be slightly different.

Our consultant from Armstrong Laing was very pleased with the level of detail in our ledger; for the chosen period of one year we had approximately 14,500 transactions to examine. The majority of the analysis took about one week, with approximately one fifth of the transactions requiring further investigation to find out exactly what they were and where the costs should go.

We found that not all transactions in the general ledger were coded correctly. It is important to check data before putting it into the software, as the information you get out can only be as good as that which you put in.

If SHU were to continue using ABC, there are a number of alterations we could make to the general ledger to make analysis easier:

- in the postgraduate section of the School there was a separate cost-code for each course, costs directly related to specific courses could be attributed as such; however, in the undergraduate section of the School no such distinctions existed and all costs were coded to the general school code – these costs, therefore, had to be untangled;

- many transactions were coded to a general school cost-code; a number of these had to be investigated to find out whether they could be directly allocated to a specific activity or course. A greater number of directly appropriate cost codes need to be generated so that less goes though the general code.

7.9 Activity interviews

This exercise checks to ensure that the information contained in the Activity Dictionary is correct. How many people need interviewing depends upon the scale of the overall project. This is also an opportunity to check that any new activities added are significantly different to existing ones.

Our consultant from Armstrong Laing conducted the first few Activity Interviews on our behalf until we understood how and what to check. We found that some people needed more help than others; some had completed their Dictionaries already, others had attempted to and run into difficulties. The most common mistakes were:

- duplication of time, the activities sometimes overlapped and participants had put the time in both;

- many participants had completed the Activity Dictionary but not added up their percentages to see how close it was to 100%, consequently, one Dictionary actually added up to 324%!

We also found that:

- there is a limited advantage, to the interviewee, of detailed analysis of diaries and other documents over gut feeling;

- it can be very useful, for the interviewer, to look at other time related documents, such as the teaching timetable, before the informal Activity Interview;

- designated names for processes and activities will be questioned, even by people who attended the first workshops – the Activity Dictionary will be refined with each subsequent use.

7.10 Driver collection

This exercise follows directly on from the Driver Identification and focuses upon collecting together the data required for the cost drivers. The ease of this process will depend upon the specific drivers chosen and whether the information required is easily accessible.

Drivers are split into two different groups – methods, which drive the general ledger costs to activities, and cost drivers, which drive activity costs.

In the SHU ABC trial, we were attempting to cost courses specifically, therefore the cost drivers were items which directly affected the cost of the activities. For example, if one course receives 5000 applications and another only receives 5, it is obvious that the cost of dealing with the 5000 applications is far greater than for the 5. The cost driver for the central admissions service could, therefore, be the number of applications. We found that for some cost drivers this information was readily available and highly relevant, but for other situations, where the most obvious and relevant cost driver information was not available, we needed to use surrogates. We expect that the amount of time spent on this exercise will depend, entirely, on the information available.

A number of issues came to light during this exercise that we had not previously considered; it is often only when you start looking for the data that complications become apparent. The following, are some of the things we had not considered until this stage:

- some of the units on our courses are taught by academics from other Schools and our academics teach on other Schools' courses – service teaching (we actively ignored this during the SHU pilot, as we were advised by the School Manager that the two amounts probably balance out in the long run);

- it was often not clear from unit descriptions what type, and amount, of assessment took place (for some units, therefore, we had to make an educated guess about the number of assignments and examinations as time was not available to talk to individual unit leaders);

- on many courses students have options and units are also shared between courses (again time was not available within this pilot study, to examine each unit list and relate the students back to the courses they were on, so reasonable estimations had to be made);

- vast quantities of data are held in many pockets around the University; frequently the same piece of information from two different sources differed and, therefore, had to be investigated.

7.11 Cost of quality workshop

A workshop, usually attended by those who were involved in the Process / Activity Workshop, to ascertain the perceived value of each activity undertaken in the School. This exercise also identifies the 'quality type' of each activity.

We had arranged for a representative sample of staff to attend the Workshop but, again, fate intervened and heavy snowfall in Sheffield the previous night meant we had a relatively small group of people – six. We also invited a couple of students to include their view on the quality of activities undertaken by the School; Armstrong Laing rarely have the opportunity to include customers in the workshop. As with the previous workshop, participants became very involved in the exercise and enthusiastic about the outcomes.

7.12 Model design and build

This is the fun part of the project for the project team. This is the stage where all the hard work pays off and you actually start to get some results. All of the information collected is put into the software.

The model design had taken place informally during the previous stages. For example we had agreed at the process / activity workshop that we would want to look at two types of cost object – individual courses and types of student. The methods and cost drivers had been chosen and all the necessary data collected.

As already mentioned, we did not receive complete time data for all academic members of staff in the School. It was agreed that we would match and duplicate the completed activity dictionaries for those members of staff who were not asked or did not complete theirs. Obviously, this is not ideal but when we receive further completed dictionaries this information can be altered in the model to provide more accurate results.

The model build took approximately three days. During the data collection process all the information had been input into Excel spreadsheets. Model building involved putting the data into the correct format (using a macro and saving the spreadsheets in .csv format) and importing it in to the software. Having already undergone two full days' software training, the team found the Armstrong Laing software easy to understand and simple to use. Once the model is built, activity and cost object costing can take place, allocations and driver volumes can be altered and 'what if' analysis undertaken.

7.13 Reporting

This stage is vital for presenting the results of the ABC implementation. It enables you to pick out the significant findings from the model and present them in a manner suited to various audiences. Once initial reports are produced it is important to validate them by checking with people concerned that the figures look correct and are made up from the costs they would expect to see. From the validation stage certain changes may need to be made to the model, for example, it may be appropriate to alter cost driver shares / weightings for certain cost objects before the reports are re-run.

There are a number of ways to create reports from the Metify software. The software has a small number of reports built in, but we did not find these very useful for the data we

wanted to examine. The software also comes with a function that can be used in Excel (Metify link) – the complexity of this was not really required to analyse our data and we found it much easier to export or copy required data directly into Excel. We found the use of pivot tables very helpful. A pivot table is easily created using the built-in Excel wizard function and provides you with an interactive table that quickly summarises, or cross-tabulates large amounts of data. The pivot table itself contains fields, each of which summarises multiple rows of information from the source data. These fields can be dragged to where you want the data to appear (either as a row or a column) and can be combined in any number of ways. For example, one pivot table we created had three fields Activity, Account and Department and we were able to analyse the data in the following ways:

- the total cost of each Activity
- the total cost of each Account
- the total cost of each Department
- the cost of each Activity by Department
- the cost of each Account by Department
- the cost of each Account by Activity.

The amount of time spent on this part of the exercise will depend on the level of reporting you want to do. It took about an hour for a member of the project team to be shown how to export data and use pivot tables and a day to produce meaningful reports on the departments, account, activity and cost object costs in varying combinations.

7.14 Results

The CNL team set out, in this project, to investigate whether ABC is a suitable tool for use in universities; during this study we have proved this concept. However, this section is not designed to describe how much things cost at SHU, but to illustrate what ABC is capable of and how that data can be used to inform decision making. (For reasons of confidentiality we cannot report in detail what the individual School examined at SHU has found out during this exercise about the costs of courses and other activities.)

The cost data can be analysed in many ways. However, the main costs are those of:

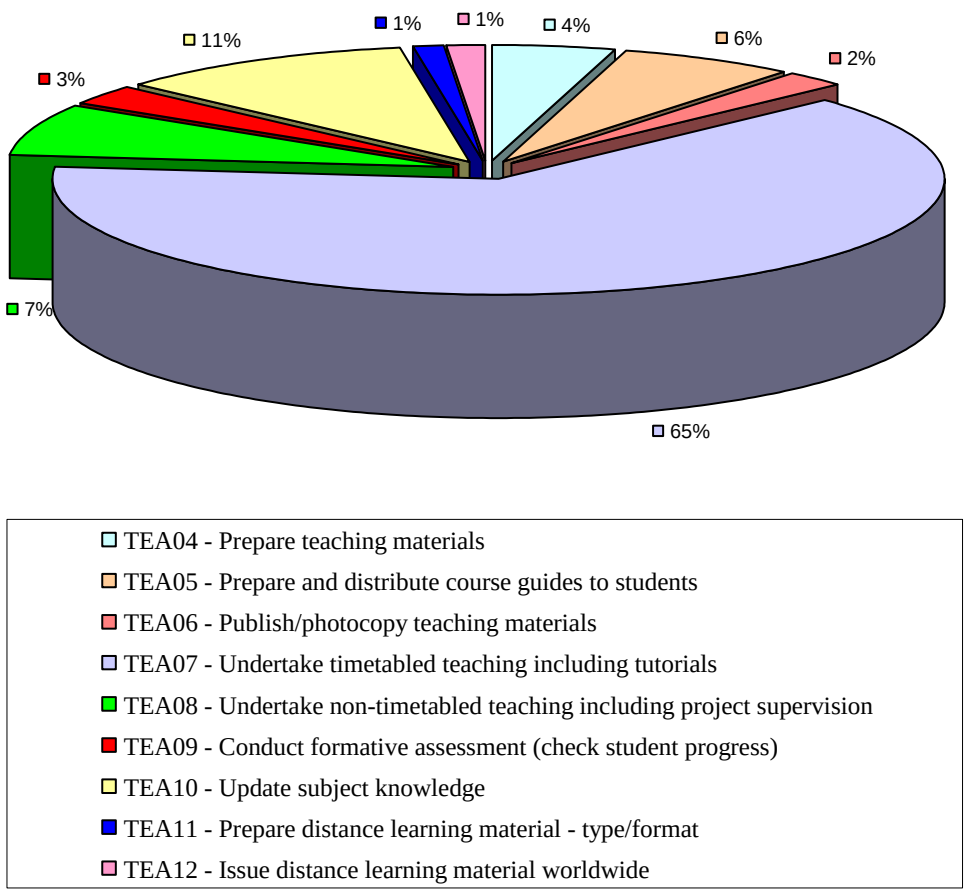
- departments (School cost codes)
- accounts (types of cost eg academic pay, course advertising etc)
- activities
- cost objects (courses and other projects and student types).

We have selected four examples of general sectoral interest which we feel readers of this report will be able to associate with. Where figures have been mentioned they have been rounded up or down to the nearest thousand and details such as course names have been changed.

Example 1 Activity Costs

Chart 1 gives a breakdown of the teaching activity costs. This analysis can be undertaken for any activity or group of activities. Not surprisingly this shows that 65% of time spent on teaching activity is spent in front of students (TEA07).

Chart 1 Teaching Activity Costs

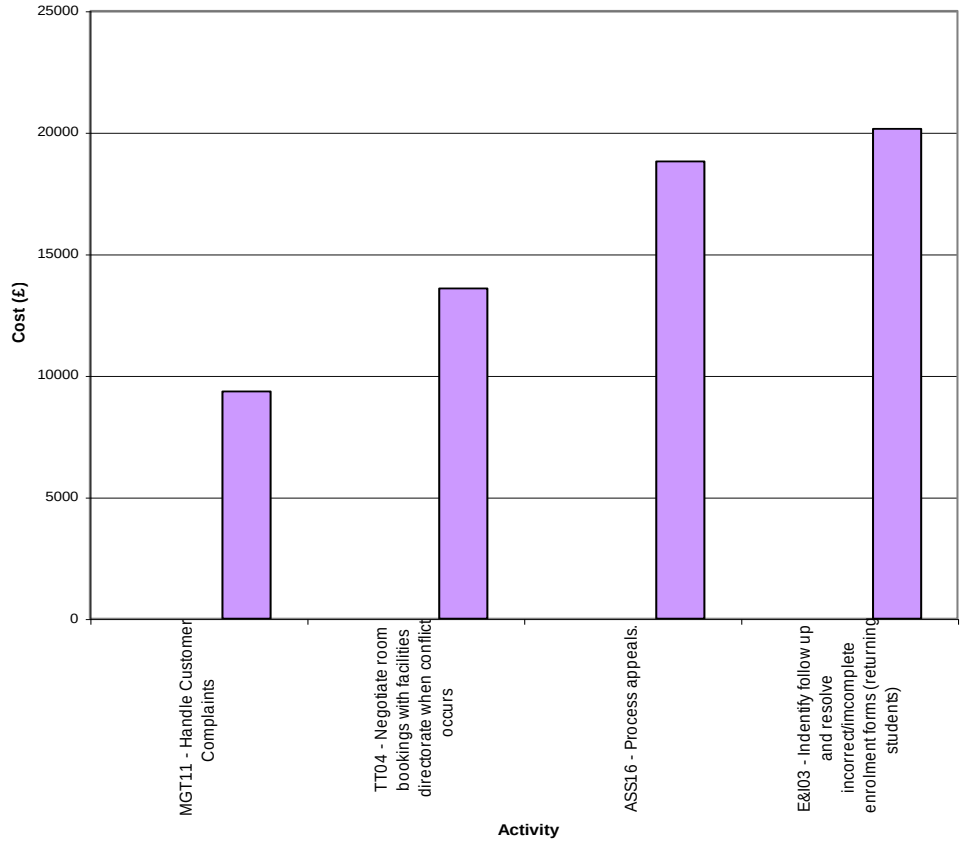


Example 2 Cost of Quality and Value Analysis

At the Cost of Quality workshop (section 7.11 above) each activity was allocated both a quality and value attribute. Once these were imported into the software, we were able to establish the total cost to the School for each attribute. Chart 2 shows the cost of a small number of activities that were considered to be non-value adding. It is this type of information that we recommend be used by management to prioritise attention for reducing the non-value adding activity costs wherever possible.

As well as attributing cost of quality and value attributes to the activities we also attributed each activity with a Course Life Cycle attribute enabling us to determine the cost of each phase of the life cycle as identified in CNL1. This was a simple exercise and was built into the model in exactly the same way as the other attributes. At some point in the future, we hope to also attribute the activities with a Transparency Review category so that Transparency data can also be extracted directly from the model.

Chart 2 Non value added activities identified



Example 3 Costs by Student Type

Chart 3 and 4 illustrate the percentage breakdown of student numbers and costs by student type. It is interesting to note that although 75% of students are full time undergraduate they only account for 68% of the costs, making them less costly per student than the other students. Also postgraduate full-time students appear to be proportionally more expensive than other students as they only make up 5% of student numbers but 11% of the overall student costs. (However, closer analysis of FTEs might change this view.)

Chart 3 Percentage of Students by Type

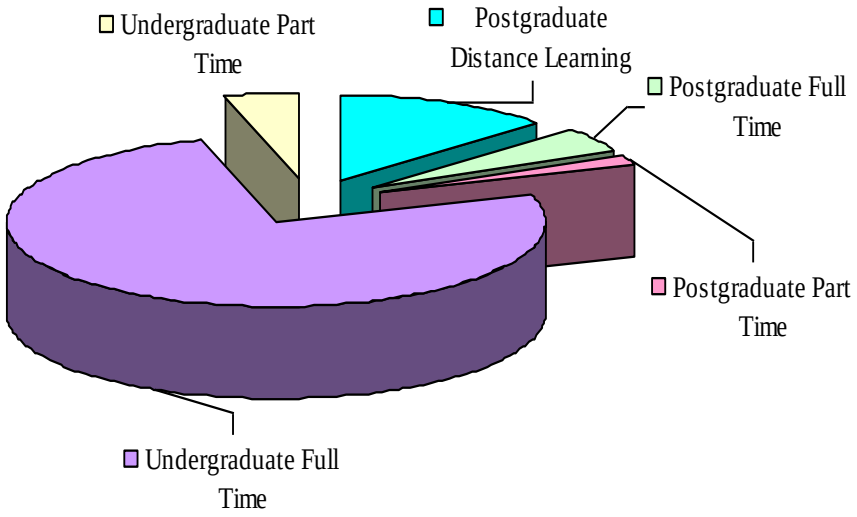


Chart 4 Percentage of Student Costs by Type

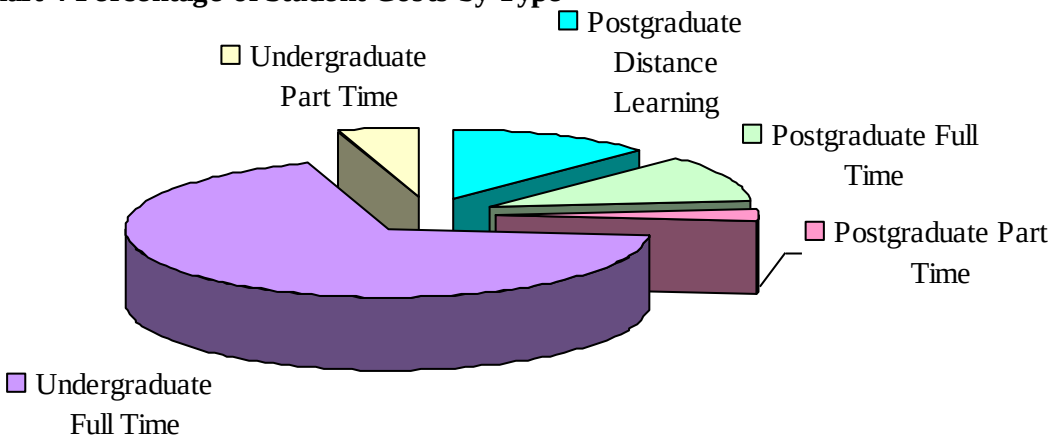
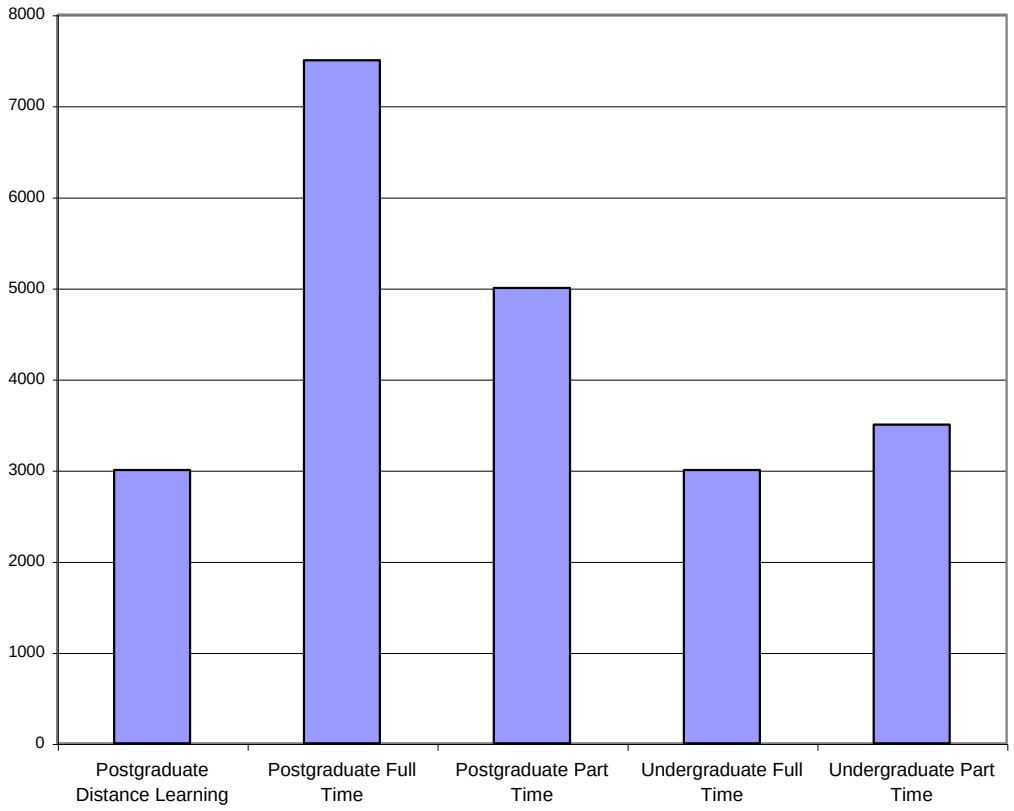


Chart 5 gives the average yearly cost per student by type in 1999/2000. The figures have been rounded to the nearest thousand but clearly demonstrate that postgraduate full-time students cost the School over twice as much per student as undergraduate full-time students. What the Chart fails to take into account is the amount of funding received per student type and in future studies a profitability figure (the difference between the cost and funding received) would be a better measure of the worth of each student to the School. Again, note the point made above about fractional students.

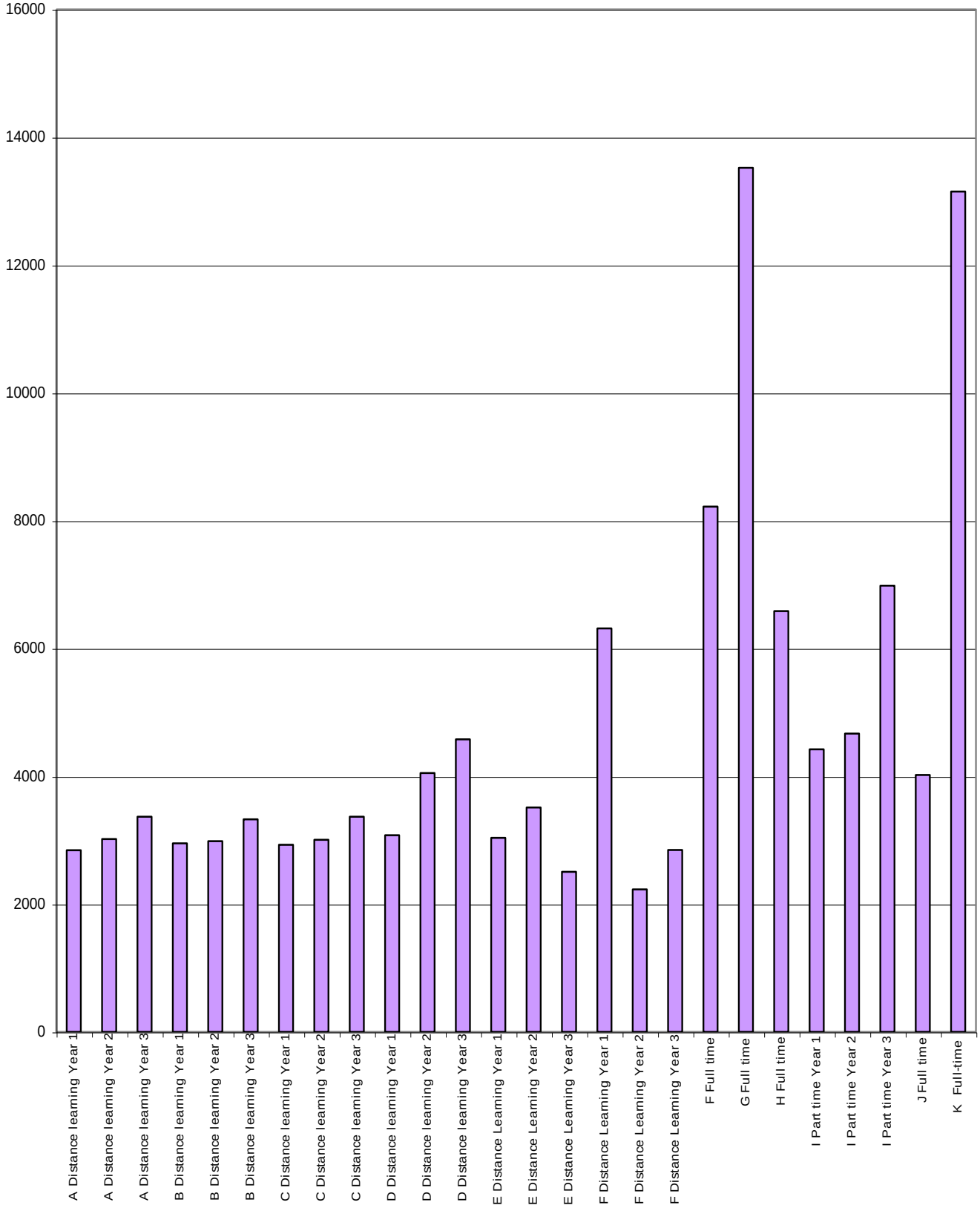
Chart 5 Cost per student type (£)



Example 4 Course Costing

Although we have been able to establish a total cost for each year of each course offered by the School in 1999/2000, and subsequently an average cost per student during that year, it is not possible to divulge detailed information in a public report. However, Chart 6 shows in a general way how the costs per student vary over the postgraduate programme.

Chart 6 Postgraduate - Cost per student by course by year



8. Dissemination

"The project has demonstrated a need for a more comprehensive record of academic activities and the effort involved in carrying them out, which should be made at the time the activities occur and not based on recollection."

DETYA and Ernst & Young (2000)

The interest in the results of CNL1 was both international and very high – 19 formal presentations (nine at international venues) have been made, 2 workshops and an informal briefing have taken place; 1 journal paper specifically on the lifecycle model has been published; 200 printed copies of the report and 112 electronic copies of the report have been circulated. There have been requests for reports from around the world; including Eastern and Western Europe, the Far East, the Middle East, North and South America, South Africa and Australia. (These figures are current as of March 2001).

We hope to build upon these successes with the dissemination for CNL2.

8.1 Dissemination activities already taken place in CNL2

All conference papers and presentations are on the project web site.

In March 2000, Charlotte Ash presented at the first research workshop of the European Distance Education Network. The paper was entitled 'A new cost analysis model for Networked Learning' and raised a number of interesting questions from the audience.

At the Networked Learning 2000 conference at Lancaster University in April both Paul and Charlotte ran a workshop which concentrated on the key issues raised by the CNL1 team (see chapter 6).

In June 2000, Charlotte travelled to Denver to participate in an international advisory board for costing projects hosted by the Western Co-operative for Educational Telecommunications. The first day of the meeting included a presentation of the CNL project to representatives from the TCM project trial sites. The second day proved to be a very interesting and worthwhile meeting, concentrating on areas of overlap and difference between the projects. Much discussion was also generated about how to take these ideas forward in future collaborative work.

In late July 2000, Paul undertook a study tour in Australia at the joint request of NCODE and Southern Cross University during which time he presented at several venues and participated in a one-day workshop.

At ALT-C 2000 in September, Charlotte gave a presentation entitled 'Real Costs from Real Faculties' which covered the progress that the project team had made with the ABC trial at Sheffield Hallam University and the process it was going to use to document the real costs of courses at the end of the project. As usual, a number of insightful and concerned views were aired.

In November 2000, Charlotte once again participated in the annual WCET conference. Over 60 participants listened and questioned the four costings projects represented in the

half-day session. It also gave speakers the opportunity to update their colleagues working on other costing projects about the progress they were making.

In addition to the formal conference presentations outlined above, the team have also run two workshops during the course of this project. The first at the SRHE in May 2000 concentrated on the outcomes of CNL1, while the second, at Salford University in January 2001, outlined the processes being used by the team to cost courses using ABC. An informal briefing also took place in January 2001 at the Open University and another has taken place in April 2001 at the ELEN project meeting at the University of Lincoln and Humberside.

The team have also written a chapter which will shortly appear in the book 'Networked Learning in Higher Education' being edited by colleagues at Lancaster University.

8.2 Dissemination activities planned for CNL2

A paper connected to the project has already been accepted for the Connections 2001 conference in May 2001 in Whistler, Canada. Whilst in Canada Charlotte and Sarah will also be making two presentations centring on the results of the project – one at the University of British Columbia and the other at Simon Fraser University. Paul will be presenting on 'Return on Investment' issues (the 'e-training' world's view of the problem) at the SMI 'e-learning' conference in London, 20-21 June 2001. In addition, papers have already been accepted for the ALT-C 2001 conference in Edinburgh, and submitted to the annual Online Educa conference.

We also hope to run a series of workshops with JISC ASSIST; a plan for these events has already been drawn up by the team.

8.3 Final report

This report will form the main dissemination for CNL2. A number of complementary copies will be sent out. In the first instance, everybody who received or requested a phase one report will be notified of the new publication and copies will available via the online order form on the project web site.

8.4 Web site

The project web site at http://www.shu.ac.uk/cnl continues to be the main source of public information about the project.

8.5 Informal dissemination

Informal discussion and dissemination has been taking place throughout the project. Contact has been made with almost all other costings studies around the world and ideas discussed. Personal contacts in the field have also been regularly consulted and updated.

8.6 Listserv

The costs-of-networked-learning listserv (http://www.jiscmail.ac.uk/lists/costs-of-networked-learning.html) has not become the online community of interest we anticipated when it was established. Although the list has 121 members, less than 40% of the messages

are from anyone outside the SHU Study Team. Many attempts have been made to encourage discussion: discourse is fierce but short-lived. The main traffic tends to be from members of the project team, but the effort needed by the project team to engage list members in discussion is thought too high given the poor results and therefore the list is mainly used to alert people about progress on the project.

9. Project Management

> *"Cost management provides a vital link between an institution's strategy and its evaluation process, and seeks to determine whether business activities are aligned with and contributing to the successful execution of the strategy."*
>
> DETYA and Ernst & Young (2000)

The project was directed by Professor Paul Bacsich and managed on a day to day basis by Charlotte Ash. Two additional research assistants were employed and the team contracted consultants from the Armstrong Laing Group to guide the trial and assist with the ABC software. The internal project team worked well together; the main challenge in project management terms was external to the team. External problems encountered by the project team during phase two of the project took a lot of time and effort to surmount.

The timescale of this project turned out to be particularly constrictive; six months was tight, but adequate, for phase one of the project, which was primarily a ground-clearing theoretical exercise; whereas phase two is a practical development which relies heavily on the co-operation of people outside of the project team, and gaining such co-operation proved to be very time-consuming.

In addition, the time of year proved to be problematic; due to the overall time constraints the main 'people-intensive' part of the trial was scheduled to fall during the first few weeks of the first semester, and it proved impossible to get the necessary large-scale staff buy-in soon enough. Moving this deadline within the constricting time-scale of six months was impossible without also moving the finish date for the project.

Another problem facing the team was the multiplicity of initiatives in the HE sector. SHU is currently engaged in three separate costings studies – two external (the HEFCE Transparency Review and the JISC CNL project) as well as a 'Cost of Courses' study being undertaken internally (under the joint direction of the PVC, Teaching and Learning, and the Finance department). In addition to these, sectoral initiatives such as the RAE (then at a crucial stage), QAA, TQEF, plus IIP and an EFQM pilot also overlapped in time with the CNL2 project. This range of initiatives was a major call on key personnel's time.

More generally, apathy within higher education towards new initiatives is well documented and accepted. Related to this is the 'pedestrian' nature of change in universities. In addition, some participants in the study seemed to be afraid of the data that ABC could generate or make visible and the uses to which such data could be put.

It became apparent during this study just how important commitment, from both staff and senior management, is to a small but potentially groundbreaking study such as CNL.

In the event, we have brought the project to a conclusion within the agreed additional time period granted to us by JISC. Special thanks are due to the members of the research team and to our colleagues, in the School of Computing and Management Sciences, and outside, who assisted us during a challenging period for the sector, the institution, its management and staff.

10. Conclusions and Recommendations

"Conventional cost information is like the sea that hides dangerous rocks."

Turney (1996)

This chapter is divided into three sections – conclusions, project recommendations and recommendations for further work.

10.1 Conclusions

Given the drive towards more transparent financial operation and quality control, ABC is, undoubtedly, the way forward. This study has piloted ABC in Sheffield Hallam University at a School level and found it to be a very useful tool. We have found that the standard ABC methodology is suitable for use in universities without major adaptation. As was expected, the usefulness of data coming out depends on the accuracy of information going in.

- ABC uncovers hidden costs that are 'generally absorbed' but not those which are 'fundamentally unrecorded', such as staff overtime (categories as defined in the CNL1 report). ABC can be used on the whole institution, individual faculty and individual course level and can be enhanced with ABM and Balanced Scorecarding, for example. In addition, ABC allows the monitoring of quality in key areas, income analysis and profitability and so on.

- In order to undertake ABC successfully, suitable software and professional support is vital. As predicted in CNL1, spreadsheet products, such as Excel, are not complex enough to tackle ABC effectively. However, there is no need to develop software specifically for the education market since existing products are available, from suppliers such as the Armstrong Laing Group, ABM Systems, ABC Technologies and Baum Hart Partners.

- Literature referring to ABC use in universities is sparse; our investigations show that activity is taking place, but is currently unrecorded. Where case studies are published, trials concentrate on the non-teaching aspects of university operation; we believe this shies away from the real issues involved. Universities must accept a pay-off / balance between amount and quality of data collected in terms of the results and cost of the exercise; opting for simplicity is likely to produce inconclusive and unusable results.

- We hope the resources provided in our handbook will enable others to undertake a similar exercise, with professional support and suitable software, at a greater level of detail in the first instance. Complete and accurate ABC takes time; it has to be reasonably complex to be accurate, most studies record two or three iterations to the model before a full ABC system is reached. Overall, ABC complexity depends on what the institution is trying to achieve; decisions on this must be made in advance.

- Our enquiries show that the 'cost of costing' argument is not thought by the sector to be an adequate reason for not costing and that general opinion now seems to be in favour of 'getting-on with it'. A number of studies show that costing must be

approached with the long haul in mind to avoid short-termism – to really reap the benefits of an ABC approach it must be firmly embedded into university operation.

- The Transparency Review is based on the principles of ABC; full ABC is just one more step and the potential benefits far outweigh the difficulties involved.

- Our work on the 'key issues' (Chapter 6) illustrates that staff-borne costs are considered to be a separate issue mainly connected to quality of management; and must be addressed separately. Student-borne costs should not be reimbursed by the institution or central funding body, but it is now widely accepted that that they should be taken into account when planning a course.

- Ultimately, costing data needs to be placed in context for it to be useable / reliable; arbitrary figures are meaningless to all and will not represent the full picture. If not, any form of costing will lead to decisions being made on a cost only basis.

- Contrary to other ABC accounts, which report that academic staff are sceptical about the exercise and afraid of the results it may yield, we found that those of our staff who put aside their initial scepticism were very enthusiastic, once they understood what was happening.

10.2 Project recommendations

These recommendations are for anyone considering a similar study to ours.

1. We expect that undertaking ABC at the School level, for the first time, will take one full-time person approximately six months, depending on the scope of study and the information available; this person does not need to be an ABC or financial expert, but does need to be sensible and 'finance-aware'.

2. The standard ABC methodology is suitable for use in universities without major adaptations.

3. Senior management commitment, with a champion, top-down support and bottom-up interest is fundamental.

4. The purchase of suitable software and professional help is essential; but both already exist.

5. It is important to adequately scope such an exercise; the amount of work involved and depth of investigation depends upon the required outcome.

6. We advise a pilot study first to identify what data is readily available and what data needs to be generated before undertaking full-scale ABC.

10.3 Recommendations for further work

Our recommendations for further work fall into two distinct groups – those for funding bodies and those for further work in a similar vein.

1. Central funding bodies may have to agree to accept full-cost proposals for both teaching and research; if full costing is advocated, it will increase pressure for institutions to be funded on a full-cost basis, otherwise financial restraints will prevent an increasing amount of innovative work.

2. There is much to gain through implementing ABC in higher and further education in the UK, but individuals and single institutions are suspicious and apprehensive; clear direction from the central bodies, such as that demonstrated in Australia, is urgently needed.

3. The 'cost of costing' is not seen by the sector as a reasonable excuse for not undertaking costing; it is essential that the benefits are promoted before the cost of the exercise and that consensus, across the sector, is reached with regard to the cost of having done the costing.

4. It is imperative that central funding bodies note that practical studies of this type must be longer than six months in duration.

5. Studies which require participating institutions to divulge sensitive information, such as costings data, must be large enough, in terms of number and diversity, of institutions involved, to anonymise institutions successfully.

6. Since e-learning is still a small part of most individual institutions' activity, a large centrally funded multi-institution study on the cost-effectiveness of e-learning is crucial.

7. Academic staff working hours must be addressed as a separate issue; ABC deals with 100% of time worked, not the number of hours and, consequently, the hidden cost of over- (and under-) time, to both the individual and the institution, will continue to be overlooked.

8. It would be very interesting, and immensely beneficial, to align our work to that of the Transparency Review team, thus providing a 'united front' on costings.

11. Glossary

ABC – Activity Based Costing.

ABM – Activity Based Management.

Activity – a function that occurs over time with recognisable results; it can be broken down to smaller parts that are called sub-activities or tasks.

Activity analysis – the evaluation of activity performance in the search for improvement opportunities.

Activity cost pool – the total cost assigned to an activity.

Business sustaining cost – a cost that benefits the organisation at some level but cannot be attributed to any specific activities or cost objects.

Balanced Scorecard – a conceptual framework for translating an organisation's vision into a set of performance indicators distributed among four perspectives: Financial, Customer, Internal Business Processes, and Learning and Growth. Indicators are maintained to measure an organisation's progress toward achieving its vision; other indicators are maintained to measure the long term drivers of success.

Basic work – normal activities that take place making up the ideal process where no internal or external failure takes place.

CNL – Costs of Networked Learning; normally used in reference to the CNL project or report.

Cost driver – is a factor that has direct influence on the cost and performance of the activities. A cost driver causes a change in the consumption of a resource. It may also be referred to as any factor that causes a change in the cost of activity (e.g. number of students).

Cost centre – is an administrative grouping to which costs are attached.

Cost object – is a beneficiary of work and services and includes courses, products, customers, projects or process outputs.

Cost pool – see *activity cost pool.*

DETYA – Department of Education, Training and Youth Affairs (Australia).

EFQM – European Foundation for Quality Management

External failure – failures that occur outside the School / University

HEFCE – Higher Education Funding Council for England

Hidden cost – Unrecorded / overlooked cost; for example, the purchase of home computers by staff members for use at home so as to extend working hours is a hidden cost.

Internal Failure – failures that occur inside the School / University

JCALT – JISC Committee on Awareness, Liaison and Training.

JCPSG – Joint Costing and Pricing Steering Group; a group constructed from the Funding Councils and sectoral representative bodies to support universities and colleges in adopting good practice in costing and pricing.

JISC – Joint Information Systems Committee; a strategic advisory committee working on behalf of the funding bodies for higher and further education (HE and FE) in England, Scotland, Wales and Northern Ireland. It also works in partnership with the Research Councils.

Method – the cost driver between resources (general ledger) and activities.

Non-value added activity – an activity that does not contribute to customer or business value.

Overheads – costs not directly associated with front-line service delivery.

Process – a series of objectives that are linked to perform a specific objective.

QAA – The Quality Assurance Agency for higher education seeks to promote public confidence that quality of provision and standards of awards in higher education are being safeguarded and enhanced.

Spare Resource – Spare resource is where some costs cannot justifiably be allocated to activities. Accommodation costs tend to be the main example of this. Say you rented 4 floors of a building, but only 3 were occupied, true ABC would require that you only allocate the costs of the 3 occupied floors to activities. The costs of the unoccupied floor become 'Spare'. They are still a cost to the business, but the software allows you to highlight them and they don't just become another overhead cost added onto activities. They stand out and managers must therefore question why this resource is not being utilised.

Surrogate cost driver – a cost driver that is not the most appropriate driver but is closely correlated with the performance of the activity.

TQEF – Teaching Quality Enhancement Fund; teaching and learning initiative funded by HEFCE.

Value added activities – activities that are perceived by service / product recipients as adding to their satisfaction. e.g. students could view having access to library facilities from their homes as adding to the satisfaction of their learning experience. Non-value added activities on the other hand are activities that are perceived not to have a positive impact on service recipients and as such create waste.

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Appendices

Full Activity List arrived at by the SHU team

Sample of the Activity Dictionary used by the SHU team to collect staff time data

Full list of publications read for CNL2

Full Activity List arrived at by the SHU team

Develop Strategic Plans		
	STR01	Undertake and contribute to School Business Plan
	STR02	Develop IT strategy
	STR03	Develop marketing strategy
	STR04	Monitor performance against School Business Plan
Understand Markets and Customers		
	UND01	Attend seminars and conferences to find out more about our students
	UND02	Undertake student satisfaction surveys
	UND03	Consult with external organisations (actual and potential employers, sponsors and partners)
Manage Human Resources		
	HRT01	Undertake staff recruitment
	HRT02	Administer, carry out, attend staff appraisals
	HRT03	Undertake disciplinary / grievance / dismissal proceedings
	HRT04	Administer personnel records and payroll
	HRT05	Undertake health, safety and welfare duties
	HRT06	Undertake official trade union duties
	HRT07	Plan and deliver training
	HRT08	Attend training
	HRT09	Plan employee development / training programme
	HRT10	Handle staff transfers
Management Planning & Control		
	MGT01	Deliver and attend information briefings
	MGT02	Prepare for and attend Board of Studies and sub-groups
	MGT03	Attend School management meetings (SST and SOC)
	MGT04	Attend other School meetings
	MGT05	Attend other University meetings
	MGT06	Undertake planning / strategy
	MGT07	Undertake management / supervisory duties
	MGT08	Prepare / manage budgets
	MGT09	Undertake financial reporting / measurement
	MGT10	Undertake non-financial reporting / measurement
	MGT11	Handle student complaints
	MGT12	Open mail and distribute
	MGT13	Service committees / meetings
	MGT14	Undertake general secretarial duties
	MGT15	Undertake technical support

Manage External Relations		
	EXT01	Prepare publicity materials and press releases
	EXT02	Undertake public relations activities
	EXT03	Set up and maintain website
	EXT04	Central marketing costs – campaign and research
	EXT05	Central marketing costs – general
Produce Timetable		
	TT01	Estimate number of students per course and per unit and produce spreadsheet
	TT02	Liase with workplanners and programme team to determine which units need to be timetabled
	TT03	Compile and request accommodation requirements from facilities directorate
	TT04	Negotiate room bookings with facilities directorate when conflict occurs
	TT05	Arrange and attend workplanning meeting
	TT06	Compile and request accommodation requirements for labs
	TT07	Liaise with technical manager to ensure specialist software availability in CMS labs
	TT08	Liaise with unit leaders and workplanners to establish staff availability
	TT09	Produce and distribute timetable
Organise and deliver teaching		
	TEA01	Apportion the work allocation and devise the teaching schedule. Assess and negotiate relevant resources
	TEA02	Write assessment papers and submit for moderation
	TEA03	Develop lesson plans / plan lessons
	TEA04	Prepare teaching materials
	TEA05	Prepare and distribute course guides to students
	TEA06	Publish / photocopy teaching materials
	TEA07	Undertake timetabled teaching including tutorials
	TEA08	Undertake non-timetabled teaching including project supervision
	TEA09	Conduct formative assessment (check student progress)
	TEA10	Update subject knowledge
	TEA11	Prepare distance learning materials – type / format
	TEA12	Issue distance learning materials world-wide
Admit students		
	AD01	Organise and facilitate pre-recruitment activities
	AD02	Handle applications and make decisions
	AD03	Prepare administration systems for student arrival
	AD04	Provision of admissions service by central registry

Enrol and induct		
	E&I01	Generate and post enrolment forms for returning students
	E&I02	Receive, check and handle enrolment forms from returning students. Identify students not to progress to next year
	E&I03	Identify follow up and resolve incorrect / incomplete enrolment forms (returning students)
	E&I04	Plan and organise induction events (NB Induction = Uni-wide, not school only focus)
	E&I05	Participate and conduct induction events
	E&I06	Participate in new student enrolment event (via face-to-face meetings with students)
Assess students formally		
	ASS01	Produce examination papers and assignments
	ASS02	Produce exam timetable
	ASS03	Co-ordinate arrangements for special needs student requirements
	ASS04	Arrange and carry out moderation (internally and externally)
	ASS05	Produce/format examination papers to University guidelines including reproduction
	ASS06	Prepare exam stationery packs
	ASS07	Oversee invigilation (by unit leader)
	ASS08	Receive and receipt course work submissions
	ASS09	Mark exam papers and assignments
	ASS10	Moderate exam results (internal and external)
	ASS11	Collate marks and enter them onto spreadsheet for the assessment board meeting
	ASS12	Attend assessment board meeting(s) (includes dealing with extenuating circumstances), and liaise with external examiners
	ASS13	Issue results to students
	ASS14	Return marked work to students
	ASS15	Counsel and guide referred / deferred / failed students
	ASS16	Process appeals
	ASS17	Provision of exams and awards service by central registry
Guidance (Customer service guidance not subject specific guidance. Does include "Can I change my course to …")		
	GUI01	Prepare and distribute information to allow staff to respond appropriately to student enquiries
	GUI02	Receive and discuss problem / enquiry
	GUI03	Contact third party (including support agencies)
	GUI04	Follow identified solutions to outcomes
Undertake Workplanning		

	WPL01	Determine units to be taught by staff group
	WPL02	Arrange and conduct a one-to-one meeting with workplanner and member of staff to agree workplan and negotiate to determine individual staff research allocation on workplan
	WPL03	Negotiate and finalise unit teams (including selection of unit leader)
	WPL04	Develop individual staff workplans
	WPL05	Arrange appointment of visiting lecturers for unstaffed classes
	WPL06	Liaison between workplanner and timetabler
Manage Students Placements		
	MP01	Input students information (including preferences) onto selection software and set up student files (with CVs and references)
	MP02	Prepare placement information for students
	MP03	Match groups of students to placements and advise via notice boards
	MP04	Receive placement applications and send to employers
	MP05	Arrange interviews on behalf of employers
	MP06	Notify successful students (and unsuccessful ones)
	MP07	Allocate tutors to students
	MP08	Visit Students
	MP09	Prepare and distribute information to allow staff to respond appropriately to student queries
	MP10	Receive / discuss and follow through enquiries
Undertake Planning and Validation		
	P&V01	Attend planning meetings and complete the planning approval form
	P&V02	Research the market
	P&V03	Liaise with external agencies where appropriate
	P&V04	Write the syllabus. Plan the units, method of assessment, management of the course / programme etc
	P&V05	Prepare and publish submission document
	P&V06	Attend validation event
	P&V07	Establish unit files
	P&V08	Buy required books and purchase copyright
Quality Assurance Scheme		
	QUA01	Maintain unit files
	QUA02	Complete evaluation sheets and unit action plans (from student evaluation forms and staff / student committee minutes)
	QUA03	Moderate the marking of coursework and exam scripts
	QUA04	Copy a sample of students work

	QUA05	Complete annual quality review form for each course
	QUA06	Liaise with external examiners (includes reading their reports, liaison between course staff and replying to their comments)
	QUA07	Attend quality and validation sub committees, course / programme committees and staff / student committees
	QUA08	Observe others teach
Undertake Research and Consultancy		
	RES01	Develop research proposals and bid for research funding
	RES02	Establish the research projects (includes finding accommodation, induction of new staff etc)
	RES03	Liaison with stakeholders including the University and sponsors
	RES04	Conduct research and business development projects
	RES05	Manage research and business development projects
	RES06	Writing publications (includes textbooks, journal articles, conference papers and book reviews)
	RES07	Prepare reports for the sponsors of specific consultancy / research activities
	RES08	Present at conferences
	RES09	Update knowledge outside specific subject area
	RES10	Evaluate research and business development projects
	RES11	Organise research seminars
	RES12	Developing and maintaining links
Design and Improve Products and Services		
	PRO01	Undertake pilot projects to evaluate and test emerging technologies
Manage SHU Network Infrastructure and Services		
	NET01	Undertake network management and maintenance
	NET02	Upgrade networks in line with new technologies and user requirements
	NET03	Undertake traffic monitoring and performance tuning
	NET04	Manage and resolve network faults in conjunction with CIS
	NET05	Manage and support customer help desk
	NET06	Support SHU conferencing and distance learning facilities
Provide Central Installation and Maintenance Service		
	CEN02	Provide support to and maintain hardware for schools/departments
Technical Support for Teaching and Learning		
	SUP01	Provide student support and advice service (frontline)

	SUP02	Provide student support and advice service (second line)
	SUP03	Provide support for Learning Centre staff and School open access areas (second line)
	SUP04	Assist with academic planning, quality, validation and subject review
	SUP05	Support on-line materials, environments etc
	SUP06	Support academic staff
	SUP07	Support administrative staff
Technical Support for Research		
	SR01	Provide support for research
	SR02	Support research students
Provide and Support Open Access Computing Facilities		
	OAC01	Support and update open access computing facilities (hardware and software)
	OAC02	Provide specialist computing support (CAD, DBMS, Graphics etc)
	OAC03	Manage and support bookable classroom suites
Install and Manage Hardware and Software		
	HAR01	Plan, organise and install PCs, servers and peripherals
	HAR02	Plan, organise and install standard office applications and business packages
	HAR03	Undertake fault diagnosis and fix PCs, servers and peripherals
	HAR04	Undertake fault diagnosis and fix office applications and business packages
	HAR05	Provide local technical support for hardware / software per formal agreement
	HAR06	Carry out hardware inventory and manage assets
	HAR07	Audit and control software
	HAR08	Purchase hardware and software (including looking after the tendering process ar lease agreements)
Central Provision of Student Support		
	CPS01	Learning centre
	CPS02	Student services
	CPS03	Recreation services
	CPS04	CIS student support and advice
	CPS05	CIS open access services
	CPS06	Infrastructure management and network services
Facilities Management		
	FM01	Labs

	FM02	Teaching Rooms
	FM03	Offices (administration and academic)
	FM04	Provision of pooled teaching
	FM05	Decant
	FM06	Other general facilities activities
Income		
	IM01	Sales income
	IM02	Miscellaneous income

Sample of the Activity Dictionary used by the SHU team to collect staff time data

SHEFFIELD HALLAM UNIVERSITY

ABM ACTIVITY DICTIONARY

Department		**Headcount**	
Section/team		**Full time equivalent**	
Interviewee		**Interview date/time**	

Instructions

1. Please complete questionnaire below, and the attached dictionary (with activity times) before interview
2. Please read through all the activities in the attached activity dictionary and identify those, which are performed in your area.
3. Then estimate the total percentage of staff time spent on each of the activities identified above.
4. Total staff percentage for your area should equal FTE*100 (Each whole FTE equals 100%) e.g. it there are 15.75 FTE, the total should be 15.75 * 100 = 1575%
5. Activity staff percent times should be estimated for the financial year August 1999 to July 2000.
6. If an activity is missing, review dictionary again to make sure that you just have not overlooked it.
7. If it really is missing then add the activity at the bottom of the relevant process
8. Put "NEW" in the column headed Sub Process and the description in the column headed Activity Description
9. A ready reckoner of activity hrs/days/weeks to staff percent is given below.
10. Avoid total times of less than 1%.
11. PLEASE, PLEASE do not amend any existing text or heading

Questionnaire

List main responsibilities of your department/team/section

1
2
3
4
5

Describe constraints, hurdles etc which prevent successfully achieving objectives

1
2
3
4
5

TO CALCULATE ACTIVITY TIME %

1 Mark activities undertaken (normally no more than 30 per team)
2 Note time per hour, day, week, etc.
3 Note the frequency e.g. daily, monthly, weekly

4	Calculate % time from table below
5	Multiply by number of staff carrying out the activity

READY RECKONER

	Per day	per week	per month	per year
15 mins	3.4%	0.7%	0.2%	0.0%
1 hour	13.5%	2.7%	0.6%	0.1%
1 day	100.0%	20.0%	4.6%	0.4%
1 week		100.0%	23.1%	1.9%
1 month			100.0%	8.3%

WHAT TO DO NEXT

1. If you need any assistance with completing the activity analysis please contact _____.
2. If possible please hand completed document to Project Manager before your interview.
3. Bring the completed dictionary to the ABC interview where any outstanding queries will be addressed.

SHEFFIELD HALLAM UNIVERSITY
ABM ACTIVITY DICTIONARY

DEPARTMENT		**HEADCOUNT**	
SECTION/TEAM		**FULL TIME EQUIVALENT**	
INTERVIEWEE		**INTERVIEW DATE/TIME**	

Seq. no	Sub Process	Act code	Activity Description	Tick Activity	Daily	Weekly	Monthly	Yearly	Percentage Time
	Develop Strategic Plans								
		STR01	Undertake and contribute to School Business Plan						
		STR02	Develop IT strategy						
		STR03	Develop marketing strategy						
		STR04	Monitor performance against School Business Plan						
	Understand Markets and Customers								
		UND01	Attend seminars and conferences to find out more about our students						
		UND02	Undertake student satisfaction surveys						
		UND03	Consult with external organisations (actual and potential employers, sponsors and partners)						
	Manage Human Resources								
		HRT01	Undertake staff recruitment						
		HRT02	Administer, carry out, attend staff appraisals						
		HRT03	Undertake disciplinary/grievance/dismissal proceedings						

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