
Effecting institutional change:

the impact of some strategic issues on the integrative use of
IT in teaching and learning

Audrey McCartan* and Catherine Hare**

*University of Durham and **University of Northumbria at Newcastle

This paper addresses the effective implementation of change through the identification of issues associated with three key institutional areas which, together, will ensure the effective integration of multimedia technologies into teaching and learning. These are the need for a firm commitment of support at the institutional level, the development of an institutional strategy with related staff-development policies and programmes, and provision for students and academic staff to acquire enabling IT skills through resource-based learning as a means to maximize the benefits to be gained from the use of these new technologies. The essential conditions which ensure effective implementation – communication between all stake-holders, leadership by senior managers, responsive central services and a mixture of funding arrangements – are discussed.

The changing higher-education environment

An increasing number of multimedia-type products are being developed for the higher-education market. This development is gathering pace as the Teaching and Learning Technology Programme (TLTP) projects deliver their courseware. TLTP and the Fund for the Development of Teaching and Learning (HEFCE Circular 29/95) are initiatives through which the integration of multimedia technologies into higher-education institutions has been actively promoted through the allocation of nationally administered funding.

In a rapidly changing higher-education environment, there is an emphasis on widening access for both school-leavers and mature students, modularization of course structures and diversification of course content, increasing costs and the diminishing unit of resource. In a speech to the CVCP, the Minister for Higher Education (11 December 1995) stated that 'new methods of teaching, especially the growing potential of information technology, offer scope for further improvements in productivity'. The Funding Councils have indicated a number of areas where they believe the use of technology can have substantial benefits. The intention is to help institutions respond

effectively to this changing environment while continuing to promote and maintain quality provision within a context of public accountability. The considerable increases in computer power and functionality which have been developing during the same time, the introduction of distributed systems, networks, and the increased availability of computers, have contributed to a growing awareness and use of the new technologies in the management, delivery and assessment of teaching and learning.

It is apparent that, at the present time, many academic staff are not poised to make effective use of multimedia products in academic courses, nor are students equipped to exploit computer-mediated learning materials. Experience at both national and local levels suggests that the availability of multimedia learning-support materials alone is not sufficient to ensure their widespread use (McCartan *et al*, 1994). The popularity of the recent programme of regional workshops, which were conducted within the delivery of the TLTP project *IT in Teaching and Learning: A Staff Development Pack*, demonstrated the need for staff development programmes in the uses of IT in all aspects of curriculum design and assessment. The importance of staff development was underlined again recently in the Higginson Report (FEFC, 1996) which recommended a sector-wide initiative to enhance the professional skills of staff in the further-education sector, and to alert them to the opportunities presented for more effective teaching and learning using modern technologies. Some examples of the development of institutional teaching and learning strategies incorporating the integrative use of IT and the implementation of specific programmes designed to improve the IT skills-base and to promote the integrative use of IT in teaching and learning were demonstrated and discussed at a forum in 1994 (McCartan and Hare, 1994). The most successful developments which actively support learning included a partnership between academic staff, on the one hand, and central services on the other, both focusing on the use of IT as a mass teaching, learning and information storage and retrieval medium.

In this paper the significance of the impact of the institutional context on the existing gap between the aims and objectives of current developmental projects, and the ability and readiness of staff and students to capitalize on their benefits, is examined through the identification and analysis of some critical institutional and strategic factors. These provide the framework which determines the development and implementation of institutional models of IT training and development.

Development of the institutional models

The need for institutional support to encourage the integration of new technology into the academic curriculum was apparent from the report of the Information Technology Training Initiative (ITTI) funded *Skills Levels Project* (Hodgson *et al*, 1994). Sixteen universities had participated actively in the project for which representative members of each institution's senior officers, academic and other staff had formed a working party to undertake an internal consultation exercise. The membership and remit of the group was determined by the priorities of each institution within the broad aims of the project. The outcomes could be used, therefore, as much to further institutional development as to contribute to the identification of trends across the consortium. There were strong indications from the participating universities, the associated programme of regional

workshops and from the sales of the report, that the project had proved to be both relevant in its focus on individual institutional situations and timely in its consideration of the development needs of all staff in respect of the integrative use of IT in their job functions.

The TLTP project *Core IT Skills for Teaching and Learning in Higher Education: Tools for the Development of a National Framework* (Hodgson *et al*, 1995) has applied similar methodological procedures to assess the impact of key institutional factors on the formulation and implementation of teaching and learning policy. About 30 institutions have been included in the nation-wide consultation process through the collection of extensive experiential data. Detailed institutional information has been gathered from nine universities, selected to be representative of the whole sector, with a number of 'old' and 'new' universities, and including a number which had expressed a wish to join the consortium as a means of benefiting their own development.

A working group was formed in each institution consisting of a wide range of staff representing different functions and including senior officers. Given institutional diversity, it was not considered appropriate to ask institutions to return the information in strict questionnaire format. Documentation was provided which indicated the areas in which responses were considered to be most helpful (see Figure 1), but institutions were free to add headings they considered relevant to their own exercise. Contact was maintained throughout with the project team, and progress monitored. Some additional visits, reviews and some telephone interviews were all arranged as a result of particular circumstances. The procedure proved to be both responsive and flexible to changes which occurred in the institutions during the course of the consultation exercise. This has meant that the information gathering has taken place over an extended period, and in some cases the original completion has had to be updated in the light of subsequent events.

The involvement of the project over a period of two years with each participating institution has demonstrated the significant impact of change as a function of various external and internal pressures. No institution was left untouched. Participation in the project's activities has prompted institutional responses to situations which have been addressed through bringing together a range of professional expertise, which would otherwise be channelled through a number of different and, perhaps, mutually exclusive reporting routes within the university. A result in one institution is a new student IT-skills initiative which aims to increase the provision of IT-skills training for students in the university by encouraging departments, or groups of departments, to introduce subject-oriented IT-skills modules. Another university used the collection of the institutional information as an opportunity to enhance communications between staff with disparate responsibilities, and to urge forward an institutional approach to the development of teaching and learning and IT strategies. The project team provided feedback through customized workshops delivered locally to the university on its responses in relation to its declared priorities. The result of the compilation of all the institutional information is a chronicle of the complexities and interconnectedness of organizational change, and the evolution of institutional structures. The information has been developed into a series of institutional models which describe the patterns of structures in place in the mix of higher-education institutions covered by the project. These illustrate the dynamic relationship between institutional culture and strategies for change and development, and the key areas of implementation for the integrative use of IT in teaching and learning.

Allocation of resources in the institution	Relationship between IT and Teaching and Learning
Funding of academic departments/sections Funding of IT, library and other services	Links Externally funded projects IT and developments in teaching and learning
IT Services Sections involved Functions IT strategies Management Monitoring of policies	Staff Development Function Institutional policy Management Monitoring of policies Funding
Teaching and Learning Policies Management Monitoring of policies	IT Training Academic staff Other staff Students
	Future Developments

Figure 1: Institutional information

Institutional models to support the integrative use of IT in teaching and learning

The models do not relate to any single institution, but rather bring together the characteristics which have been identified in a number of universities of similar types. They focus on the key factors relating to IT in teaching and learning, presenting the inter-relationship between the centre, the executive framework and the support services of the institution in an attempt to assess the most effective arrangement for integrating IT in teaching and learning. There are basically three models (illustrated in Figure 2).

1. Traditional 'passive' model

As the name suggests, this model is characteristic of the traditional universities typified by strong central services, e.g. IT services and staff development, funded by top-slicing and operating independently. In addition to the top-slicing, other funding allocations are normally on a formula basis.

Alongside the central services, and running in parallel, is the committee structure. The committees of which the most important will be chaired by Pro Vice Chancellors, Deans of Faculty or senior professional staff, are a well-established mechanism for policy and strategy development. However, in practice there is evidence that they are now more a vehicle for implementation, with policy and strategy being developed by small groups of senior staff. Their composition will vary either by a process of election or rotation resulting in a lack of continuity which can hamper sustained development in an area such as the integration of IT into teaching and learning which is often characterized by extreme polarization of views as to its merits and benefits.

Both the central services and committees dispense their 'service' or authority to the users

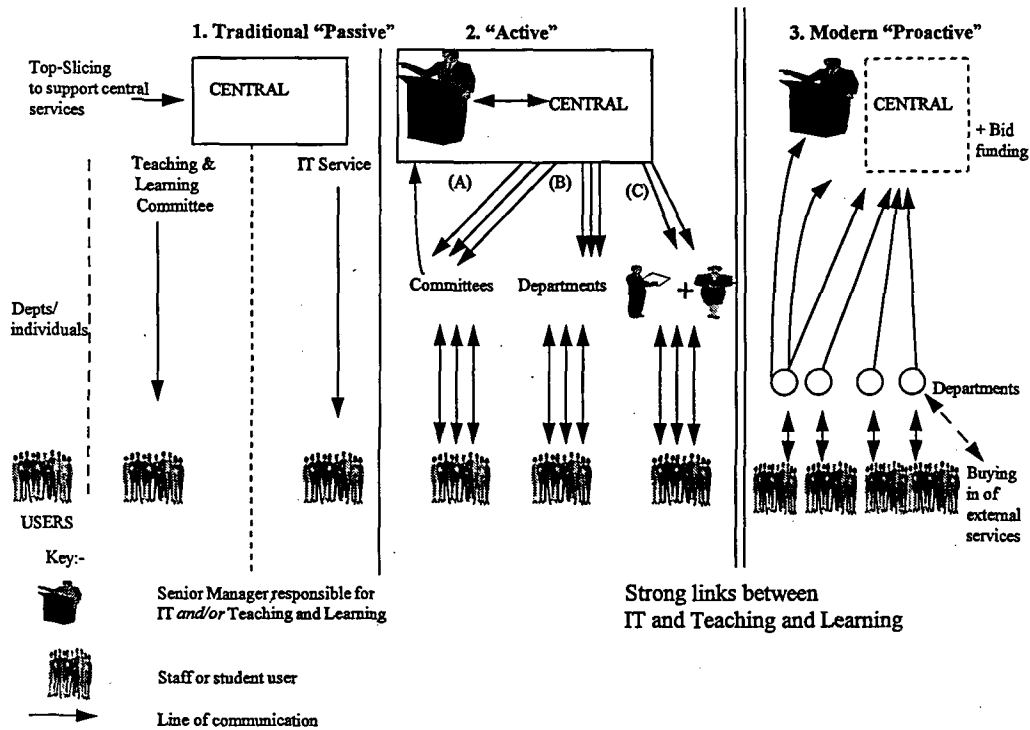


Figure 2: Institutional models to support the integrative use of IT in teaching and learning

acting as one-way, top-down conduits for institutional policies and strategies which tend to be rather weak. There is no single individual at a senior position in the centre whose prime and constant responsibility is IT and/or teaching and learning.

This model in the past provided reasonable technical infrastructure (that is, from Computer Board monies) together with development funding. However, nowadays the harsh reality is a major reduction in funding combined with the introduction of devolved budgets and associated devolved responsibilities. This has resulted in central services refusing to take on additional services unless they get paid to do so. The departments individually make choices about how they support IT in teaching and learning in terms of equipment, staff development and student IT-skills programmes. They often duplicate activity with initiatives repeating work already undertaken and evaluated in other departments. This is particularly true in the case of documentation which could be effectively and efficiently co-ordinated at the centre. There are, however, pockets of activity led by enthusiasts often with funding from institutional initiatives. But their best efforts do not get a chance to propagate because of the rigidity of the system, the absence of effective communication channels, and the lack of a champion at a senior level. Despite some users being well served for specific applications, there is no recognition of the developing importance of IT in teaching and learning because there is no single focus at the institutional level, and no forum for discussion and exchange of ideas. The communication is all from the top down, with only a relatively small number of people

involved. The rigidity of the structure, which in the past was a strength when change was a rare phenomenon, now has become a weakness in providing an appropriate environment for the integration of IT in teaching and learning which, because of its pervasive nature, needs to cut across what remain parallel and independent activities.

2. 'Active' model

This model, with its three sub-models which have either committees, departments or a group of senior staff at the second level of management, can be found in both traditional and new universities. Central services remain relatively strong but participate actively in serving the needs of their users. In each of the sub-models there is effective and efficient two-way communication with the users, and a direct feedback loop to a senior individual whose prime responsibility is IT and/or teaching and learning.

In this model, devolved funding is the norm, and results in devolved structures and responsibilities which work together effectively to maximize the benefits and efficiency gains from the funding arrangement. It is likely that departments will buy into central services which might include access to the network, provision of training and/or training materials for staff and/or students. The committee structure may in some cases retain an important role, but the structure will allow for the bringing together of the teaching, information and technology issues because of more opportunities for communication and exchange of ideas between and across levels of management. The whole culture and communication infrastructure actively involves more people across the different levels, thus providing a robust framework with in-built flexibility.

The greatest strength of this model is the senior individual who embraces technical expertise with an understanding of its implications for the management of all aspects of the university's business, together with the vision to fulfil the developmental needs of all staff in respect of the integrative use of IT in their job functions. This feature can, however, also be the greatest weakness of this model, particularly in the new universities where senior staff are in promoted and therefore semi-permanent posts and may not have the mix of knowledge, skills and vision required. In the traditional universities there is also a potential weakness but for a very different reason: the senior individual will hold the post only for a fixed term of office, which is good if the person lacks vision but poor if the person has vision and moves on. There is another potential weakness in this model where resources at the centre are not adequate to maintain and consolidate the central services. This situation is especially prevalent in the new universities which are still striving to catch up in terms of IT infrastructure without any additional funding to compensate them for the Computer Board monies from which the traditional universities benefited in the past.

3. Modern 'proactive' model

This model to date seems to appear only in the new universities. There is an additional funding element to top-slicing and formulae: bid funding. Central services are no longer large and tend to be integrated. They also operate on a service model supported by service-level agreements. Devolved budgeting and responsibilities are very much the norm, with some buying in of external services, including training and documentation. The committee structure is very weak, with management being implemented via a hierarchy of management groups composed in the majority of academics who have been promoted to management posts.

The institutional policies play a key role of informing, directing and providing a monitoring device and/or performance measures for all developments. They hold together what is a very distributed and therefore potentially fragile structure. The departments/schools become key nodes implementing institutional policies, often by the appointment of academic staff to some responsibilities for IT in teaching and learning, including staff development, and also for taking feedback from the consumers/users. The system is thus responsive to user-need. There will be strong departmental projects, including participation in ITTI and TLTP projects. The central services act as the hub of the network, but communication can break down as neither the hub nor the nodes want to invest their resources, which are often limited, in maintaining the links, and the nodes in some cases may even choose to buy in services from outside rather than pay into central provision.

A recognition of the importance of the strong linking of IT into teaching and learning is a significant feature of this model. This is predicated on strong networking between all staffs. The impetus for change, however, also needs a strong and enthusiastic individual at the top who ideally has responsibility for both IT *and* teaching and learning. A key focus is the provision of a range of proactive, integrated services, providing expertise and support to underpin the implementation.

The proactive model thus involves the greatest number of people with communication top down, bottom up and across the levels. It is the model which applies to a greater number of institutions than the other two models. The approach adopted by each university depends very much, however, on the institutional context, and progress will be determined by the strength of the imperative to integrate IT into teaching and learning.

The progression from model to model does not need to be incremental. It is possible to leapfrog a stage. The impetus/movement for change comes when IT is linked into teaching and learning, and this is reflected in the institutional policies and strategies.

Effective implementation of change

Institutional change is a continual evolutionary process, especially in the use of IT where institutions are urged to exploit its use in the management, delivery and assessment of teaching and learning. The different models have shown varied responses to the integrative use of IT in teaching and learning. The most recent manifestation of this imperative can be seen in the Teaching Quality Assessment (TQA) exercise which both explicitly and implicitly makes requirements on teaching departments in terms of IT management and integration issues. This imperative to integrate will be interpreted in different ways depending on the particular institutional context. The evidence, as highlighted in the detailed expositions of the passive, active and proactive models from the consortium institutions, which represent varied traditions, missions and executive frameworks, shows the need to fulfil the following essential conditions to ensure effective implementation:

- communication between all stake-holders (all personnel and students);
- a senior manager in charge of IT and/or teaching and learning;
- responsive central services;
- a mixture of funding arrangements.

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