25 Integrating Technology into the Activities of a Traditional University: Facing up to the Problems.

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Abstract

This paper describes the evolution of an institutional strategy for on-line learning development at a traditional campus based university. It evaluates the implementation of this strategy, mainly by analysis of feedback obtained from staff attending ICT related training courses. One conclusion from the evaluation is that it is possible to avoid unnecessary duplication of resources, even in a highly devolved organisational structure, by a combination of central leadership and appropriate locally based support. Other conclusions include the fact that a majority of staff are quite eager to use ICT tools to improve what they do and that the major factor which prevents them is confusion about, and reliability of, both networked and local ICT tools and services. There is also evidence to show that concerns about technology taking a lead in the future design of pedagogic approaches are not well founded. It is quite clear that most, if not all staff are sufficiently professional in their approach to ensure that any use of ICT benefits, rather than harms, the student learning experience.

1. Introduction and Background

The information and communication technology (ICT) revolution, coupled to changes in society, have placed great pressure on institutions like the University of Westminster (UoW). There is a continual need to improve ICT infrastructure and develop innovative approaches to teaching and learning that fully exploit ICT (DTI Report, 2000).

Different institutions are responding in different ways, organising infrastructure and support to best suit their institutional culture (CRE Report 2000; Jost & Schneberger 1994; Liber 1998). Many previous reports have highlighted a range of difficulties that can be encountered in trying to embed learning technology across an institution (see for examples Butler 1997; Bull & Zakrewski 1997; Liber 1998; Liber 1999; Ramsey et al., 2001; Butler & Sellbom 2002). In recent years similar problems have been encountered in the strategic drive to make greater use of learning technology at the University of Westminster (UoW)

This strategic drive began in 1997 when UoW published a new institutional strategic plan that emphasised the use of ICT both for the management of information and support of teaching and learning. At this time, like many other

institutions in the UK a minority of academic staff were using ICT extensively in course delivery. After publication of the strategic plan, involving many more staff in the effective use of ICT to support and share the vision of an ICT enabled culture became a priority.

A major organisational theme of the new strategic plan was devolution. As part of this the central computing services were essentially split into two distinct parts. Responsibility for the network and user authentication processes remained as a central function. However face-to-face support for students and other users was devolved down to campus level and each campus (there are four campuses at the UoW) formed its own computing and audio-visual aids service. Inevitably each campus team has evolved differently, fulfilling the aim of better matching provision of services to local needs. However one consequence of this mode of operation has been overlap and duplication of some developments.

This paper will first describe a series of major events and changes that have occurred in the 5 years following publication of the strategic plan. This will serve to set the scene for an evaluation of the success and failures of a development approach ultimately characterised by a combination of devolved support mechanisms with central leadership. The later sections of the paper will specifically consider staff development approaches and issues, the sharing of technology resources and know-how, and the views of staff generally towards the use of ICT.

2. First Steps: Development of an institutional Intranet

Shortly after publication of the strategic plan, a few individuals, from academic and central departments, applied for university development funds with the intention of developing an intranet to provide an institutional focus for the distribution of information to students and the development of staff skills in ICT. An intranet was established and very rapidly several central departments established sites to provide information to other staff and to students. The development attracted much attention and was to a degree supported by central computing services but not, at least

overtly, by local campus computing services. Shortly afterwards funding was obtained to establish distinct campus intranets with the intention of specifically stimulating the development of teaching support websites on each campus.

Establishment of the intranets was based on Microsoft technology. At the user end the web authoring tool Microsoft Frontpage was used in an attempt to enable staff with little technical expertise to easily author their own web pages and manage their own web sites. Staff development courses in the use of Microsoft Frontpage proved very popular. In the space of a few months as many as 150 academics had attended such courses. The policy at the time was that any member of staff who had attended a course could if they wish have a website established for them which they were then expected to maintain and manage. This inevitably meant that the early development of module teaching support websites was very much a bottom up approach. Efforts to engage heads of school and departments in any concerted effort to increase the number of teaching support websites lagged behind the capability to empower junior colleagues.

In the first year of the intranet development the number of academic staff with rudimentary teaching support sites increased dramatically, with nearly 200 such sites being created across the four campus intranets (Iacconi & Saunders 2000). During this period central departments made a clear commitment to develop their use of the intranet to provide information to both staff and students. However academic departments remained to a large extent dichotomous in their approach. Some made use of the centrally supported intranets whilst others continued to use existing or newly developed local arrangements for the publication of internal websites. There were one or two exceptions where entire schools or departments decided to have teaching support websites for every module and course.

It is estimated that only 20% of those staff introduced to web publishing through the development maintained their websites for any length of time. Any exceptions occurred in schools and departments that chose to make clear commitment, as a group, to the use of such websites. Again it is notable that in the one school where a high proportion of teaching support sites remained relatively up to date, a member of staff was employed full time to help maintain them. Although the percentage of staff who continued to maintain a web site once setup was disappointing, the overall development served to raise the profile of ICT generally and to stimulate debate on the use of ICT for the support of teaching and learning and administration.

3. Development of a policy for on-line learning

Nearly three years after establishment of the first intranet the University took steps to re-emphasise the corporate intention to develop the use of ICT to support teaching and learning.

Up to now the institutional teaching and learning strategy had said little in depth about the potential for exploitation of ICT. Although it made statements about the need to promote the use of ICT on a fitness for purpose basis, it did not provide any clear strategic direction or state how ICT should be used. Recognition of this fact, plus the growing realization that the developments in campus based computing services was leading to duplication in tools to support on-line learning development, the institution established an on-line learning group (OLLG).

The OLLG was made up of representatives from every academic school (11 in total). All 4 managers of the local campus computing services and the two most senior staff from central computer services were also members of this group. The group was chaired by a senior academic with experience of the use of ICT to support on-campus teaching and learning. The role of the group initially was to identify the main reasons why a policy on on-line learning was desirable within the UoW context and subsequently to identify priorities for development across the University as a whole. All of the academic representatives were chosen on the basis that they had experience of exploiting ICT in teaching and learning. The main reasons identified by this group as drivers for the development of a policy on on-line learning are summarized in table 1.

Reasons to have a stated policy for on-line learning developments
• To increase opportunities for the delivery of independent, student centred learning.
• To make ourselves more accessible to students with all types of study need whether first time or returners to HE.
• To increase the potential for innovative forms of study, thus improving the quality of our offering.
• To provide flexibility of study mode and give students of all types an extra skill by increasing their IT literacy, thus implementing our mission of educating employable people.
• To remain competitive because increasingly all HE institutions will have an element of OLL.
• To continue to be cost effective

Table 1: Stated reasons for an on-line learning policy at the University of Westminster

Within six months the group had drafted a relatively brief policy statement that sought to highlight the major strategic direction the University would go in its development of the use of ICT in teaching and learning and academic administration. An underlying theme of the policy statement

was that on-line learning developments should be for all staff and not for just an elite few. Equally the policy sought to emphasize that high quality ICT based teaching and learning did not necessarily require the use of anything other than routine ICT tools (e.g. e-mail), with which increasing numbers of staff had become familiar in recent years.

The policy statement was presented at a range of internal fora and a number of internal committees and groups. After revision, in the light of comments received, the policy statement was considered and approved by the University's academic council. A key element of the approved policy was a proposed categorization of on-line learning into a series of levels, differing mainly in the degree to which face to face activities could be replaced by some form of on-line alternative (see table 2).

At this stage in time the University had not allocated any recurrent central funding for on- line learning developments.

Level	Characteristics
1	The routine use of e-mail to maintain contact with students. Replacement or enhancement of classroom sessions used purely for information delivery by electronic information.
2	Elements of level 1 but including a wider variety of web based file types requiring increased technical skills to produce (e.g. sound and video files)). At level 2 the pedagogic approach would be expected to have changed with use of the on-line material geared towards reduction in the number of classroom based lectures, making contact potentially more flexible.
3	Elements of level 1 and level 2 plus the replacement of some interactive activities normally undertaken in class by electronic processes. Activities at this level would entail the use of asynchronous and synchronous on-line discussion and on-line assessment enabling the use of a variety of question types, automatic marking and provision of automatic feedback.
4	All of the above level specific elements plus the use of interactive multimedia tutorials and live delivery and discussion components (e.g. video-conferencing, multicasting). At this level it would also be appropriate to make use of some form of managed on-line learning environment to collate the various elements that make up the level.

Table 2: On-line Learning Level Descriptors

Equally no senior member of staff had been formally appointed as responsible for on-line learning matters. In the absence of any recurrent core funding, initial developments after publication of the on-line learning policy relied upon the continued use of University development funds. In addition as no senior member of staff had been designated as responsible for implementing recommendations arising from the policy, the OLLG assumed that role. This group was accordingly asked to make recommendations for the use of development funds to support teaching and learning.

In the first year after the publication of the on-line learning policy, as a consequence of recommendations made by the OLLG, £30,000 of development funds were used to purchase a University wide license for the on-line assessment tool QuestionMark Perception. In addition a number of 'in-house' tools for the support of web based communication and distribution of information were commissioned. At this stage there was no recommendation to implement any commercial virtual learning environment (VLE) across the institution. Part of the reason for this was a perceived general lack of interest within academic departments for such a development, coupled to the fact that the policy set the direction clearly to be the support of 'traditional' campus based students rather than the development of distance learning courses.

4. Central support for on-line learning development

In June, 2000 the University seconded a senior academic to oversee the development of on-line learning across the institution. One of the major recommendations of the on-line learning policy was that a mechanism should be found to provide dedicated support, part technical and part pedagogic, to staff wishing to develop their use of ICT to support teaching and learning.

All four campuses were persuaded to include a new post, loosely termed on-line learning support officer, in their next annual business plan. Income into the University in that year was such however that the campuses were unable to fund these new posts. The University subsequently took the decision to finance these posts on a temporary basis from its block government grant. A hybrid form of management was adopted for these four post holders. Although physically based on each campus (one person per campus) the post holders reported to the senior academic with responsibility for on-line learning development. This required the senior academic concerned to work very closely with the heads of each local campus computing service as well as central computing services. This model was thought at the time to be the best way to ensure an appropriate balance between matching of provision to local requirements and the need to avoid each campus separately re-inventing several wheels. In 2001 these four posts were made permanent by the University.

5. Virtual Learning Environments (VLEs)

Part of the reason for not attempting to implement a VLE across the institution prior to 2001 was the perceived need to

have in place an appropriate infrastructure for the support of staff at local level. By 2000, one of the four campuses had already started to use a VLE for the delivery of some undergraduate and postgraduate modules and courses. The other three local Campus computing services were becoming interested in developing their own use of a VLE. At one point there was the possibility that two other campuses would begin piloting different VLEs to each other and to the VLE that was already in use at one campus.

Early in 2001, the senior academic with responsibility for on-line learning development commissioned from central computing services a widespread review of commercial VLEs. This included conducting a needs analysis across the institution with a view to recommending a particular VLE product for institutional rollout. In the event the VLE Blackboard (not the one already in use at one of the campuses) was chosen. Early in 2002 a license for Blackboard was purchased and the on-line learning support officers have recently started the process of helping staff to begin using this product. The initial results and levels of interest have been exceptionally high and already a proposal to upgrade the license to one which permits direct integration with student records and user authentication systems has been made. In addition the one campus that had already invested quite substantially in an alternative VLE agreed to migrate to the use of Blackboard.

6. Evaluation of the last 5 years

There have been a number of areas of activity or features of the environment at UoW that have and are continuing to feature prominently in implementation of recommendations arising from the on-line learning policy (OLLP). These areas include staff training and development, the sharing of resources and good practice, tensions between centrally driven initiatives and local computing services, the importance of network reliability and the attitude of staff generally towards developing their use of ICT. These will now be discussed in turn.

7. Staff Development and Training

One of the very few clear conclusions that can be drawn from the events of the past 5 years is that staff simply cannot get enough of training in the use of ICT tools. Any course related to the use of technology in teaching is invariably full. It therefore is something of a mystery that so few staff who master a tool, (e.g. a simple web authoring tool) have gone on to use their new found capability in a regular and sustained manner. The most often cited reason given for this is a lack of time. Sometimes this means lack of time to use the newfound knowledge immediately after the training session and then finding, when time is available, that what was learned on the course has been forgotten or worse, cannot be applied in the local environment. In this respect follow up local support is

essential for staff who cannot implement what they have learned straight away.

When such local support is absent, more sustainable results can be obtained if staff are given training in their own surroundings (e.g. in their office). It often also helps if staff are trained in small cognate groups that are discipline related, as the more able among them can then support the others after the trainer has gone. Previous reports of the integration of technology across institutions have highlighted the significance of local support mechanisms (Butler 1997).

With respect to staff development and training the approach at the University failed to a degree, as between 1997 and 2001 staff were almost wholly dependent on one member of staff for training and follow up support. Appointment of the campus based on-line learning support officers has eased this problem and already, with the recent implementation of Blackboard, there is a sense that staff taking initial training courses in the use of this VLE are then going on to develop much further when back at their own local part of the University. Part of the reason for the already perceived greater success with Blackboard is probably due to the relative simplicity of this tool when compared to say the web publishing program Microsoft Frontpage. However there are also reasons related to the general ICT infrastructure that have undoubtedly led to poorer than expected take-up of network based tools. The paper will return to the issue of network services impeding staff progress in a later section.

8. Sharing and Dissemination of Good Practice

The sharing and dissemination of good practice is a very popular term with staff developers. However, it is important to remember that what is good practice in one situation is not necessarily true for another. This is very clear with respect to the use of ICT to support teaching and learning, where the success of a particular approach can be <u>very</u> context specific.

Experience at Westminster has shown that most staff attending development sessions want to know how to make the technology work. They are interested to see examples of how the technology has been used, but if they go away from a session without having experienced 'hands on' the technology in action they are disappointed. If they experience the technology and it works they go from the course with a very positive attitude. As a consequence it can be hypothesised that in staff training courses the emphasis should be on the technology and not the pedagogy. This is not to say that technology should drive the pedagogic approach but rather that staff developers should have greater faith in colleagues to use any new found technological expertise in a sensible manner, to facilitate and improve student learning. By and large most staff are professional enough to realize that ICT offers opportunities to deliver

education in a different way. However they also see the potential pitfalls very rapidly and understand that any approach to teaching and learning, whether centred around ICT or not, requires thoughtful, careful planning. There was a period at Westminster when the 'ogre' of ICT was much feared and the impression given that staff would in some way misuse it, providing students with web pages to read and little else. The over emphasis of staff developers on 'the pedagogy' is a complete turn off to most staff who just want simple ideas and ideally, simple technology, to help them deliver the pedagogic model that they have used for many years and are comfortable with.

Local events for the sharing of good practice are favoured by staff on the campuses and are often the best way to ensure, if worried, that pedagogic issues are given their rightful place by facilitating discussions of examples of the use of ICT. However, centrally organized 'larger scale' events have also worked well. In June 2001 an on-line learning symposium was held and attended by over 250 staff from across the University. At the symposium all presentations, bar one, were made by staff of the University. This event turned out to be extraordinarily successful at the sharing of ideas with a major feedback from attendees being that they had little idea, prior to the event, just how much was already going on in the University in this area.

By far the greatest success has been achieved recently through the use of the VLE Blackboard to offer a wholly on-line course on teaching and learning on-line (in essence a distance course but mainly for staff within the institution). The first time this course ran around 30 staff started and completed the full 4 weeks of the course. The course combined the use of discussion boards to address a range of issues associated with the integration of technology into teaching and learning. The very nature of the delivery inevitably made the technology the core of the course but in some respects this seemed to stimulate discussion of non-technological issues. Much of what will follow in the next section was actually gleaned from the discussions that took place on this course. The on-line approach to staff development is an interesting one as it facilitates collaboration with other institutions on such issues of the effective use of learning technology (Cannata *et al.*, 2002).

9. Attitudes of staff towards the use of ICT

As stated earlier there has never been any problem in getting staff to attend short courses on making web pages, using e-communication tools and latterly, using a VLE. This tends to suggest that there are substantial numbers of staff who are not too worried about the consequences that ICT might have on their job (around 350 out of a total number of some 750 full-time academic staff have attended centrally provided courses in the past 4 years). Over the past 4 years only a handful of staff have explicitly stated that they felt an increased use of ICT might put them out of a job or lead to a greater workload.

As stated earlier, the single most often stated reason for minimal progress with ICT is a lack of time, coupled to insufficient follow-up support at local level. To a degree the University has responded to this through the appointment of on-line learning support officers. However it is too early to ascertain whether these appointments will lead to a greater take-up by staff of tools that they are shown on short courses. Initial signs are encouraging in that attendance at recent locally provided workshops has been high. However overall success will depend upon how many staff are prepared to make a go of it by using the tools themselves rather than relying on technical staff to always be there to do the technical 'bits' for them. There is some hope that as tools, such as Blackboard, become easier and easier to use significant numbers of staff will see the benefit in making direct use of such tools themselves.

The ease with which technology can be used is naturally significant. Closely linked to the 'lack of time' reason is the perceived unreliability of networked services and local computing services. Recently (November 2001) a set of 'in-house' tools designed to promote communications and the distribution of information between staff and students and between staff were made available. Accessible from the intranet homepage these tools (collectively known as the Westminster Network Applications, see table 3) relied on the user being able to authenticate to the Microsoft NT operating system. At UoW most student network authentication is done via NOVELL rather than NT (or Windows 2000). An attempt to automatically synchronise the passwords required for the 2 separate operating systems (to avoid the need for 2 separate passwords) was made and failed badly. This meant that at the time of the launch of the applications the passwords for the NT system became very unreliable. As a consequence many staff found that when they tried the applications from their own offices they appeared not to work. Indeed it subsequently emerged that the whole issue of passwords was one of complete confusion to the 'average' member of staff with central computing services essentially using 3 different operating systems to provide the range of basic services (e-mail, file storage and the web).

For on-line learning developments to succeed it is absolutely vital that the tools to be used work seamlessly and reliably. The need to make networked systems operate together, with minimal effort on the part of the end user, has not been met at UoW. The net result has been that a number of web based tools that could have a significant impact on internal communication, an underpinning feature of any learning environment, have been largely ignored by a majority of staff. This is unfortunate especially as their introduction was led by staff at campus level.

The negative impact of unreliable networked systems has been highlighted previously as a major problem in effecting the integration of learning technology (Butler and Sellbom 2002). By and large however staff are fairly sure that ICT can make a difference to the quality of educational provision in the

21st Century, bringing them closer to an ever diversifying and growing body of students. Certainly there is little evidence to suggest that staff feel ICT opportunities are over-hyped or that seizing ICT enthusiastically will mean a loss of jobs. Rather there is the view that if a lecturer in the modern age does not start using ICT to support their teaching and learning they are likely to be replaced by one that does. There is clearly a concern though that the use of ICT needs an up front investment of time and that unless properly managed when implemented, an increased workload can result.

Application	Main Features
Student Noticeboard	Text messages can be sent to groups of students; can include an attachment of any file type and size; distribution lists dynamically/ automatically generated; can programme messages to 'disappear at a pre-set date.
Staff Noticeboard	As above but for staff to send to other staff
Document Library	Can archive documents to the Intranet and selectively make documents (or other file types) available to selected groups of staff.
Question & Answer Database	Enables the posing of questions and archiving of both question and provided answer in searchable database.

Table 3: The Westminster Network Applications

10. Tensions between local and central initiatives and support

The decentralised model of operation for a University has its advantages and disadvantages. An obvious advantage should be that local provision is better matched and suited to the needs of users. However a major potential disadvantage is that disparate local groups will separately develop systems and tools that overlap and lead, at the institutional level, to cost ineffectiveness. The desire at UoW with respect to on-line learning developments has been to develop and promote centrally supported initiatives that provide what staff at the campuses require. Initial developments, such as the launch of the University Intranets, sought to do this by working very directly with individual staff, a truly 'bottom up' approach. However if you cut out the 'middle-man' he (or she) will find something else to do and this will often be different to the initiative started. Indeed the development of the intranets is a

good example of this. Significant numbers of campus based staff made use of essentially centrally provided help but local campus computing services, missed out to a degree in the 'bottom up' approach and either did not provide support at all or did not know the right support to provide. Indeed, when separate physical servers for each campus intranet were purchased from central budgets, they remained located centrally despite the offer to allow them to be sited and managed locally.

In the latest developments with Blackboard, the local campus computing services have been more closely involved. Already there are more encouraging signs of greater collaboration both in the provision of training and also with respect to the sharing between campuses of scarce hardware and support staff.

11. Discussion and Conclusions

There is every indication that a majority of staff want to use ICT to support what they do. This is evidenced by the immense popularity of any courses to do with the use of the web or network. Staff who come on these courses state 2 main reasons for doing so. These are firstly that they need to start using web based tools because everyone else is and secondly, that they hope that using such tools may help them to do their job better or more easily. Most administrative staff are unequivocal in their belief that effective use of such tools can help improve what they do.

As a group, academic staff are somewhat less convinced, but increasingly seem to accept that future students will expect at least a part of their learning to feature the use of on-line systems. Additionally there are growing numbers of academic staff who seem confident that some on-line approaches can help to combat the failings of traditional campus based delivery to ever larger student cohorts. This increase in desire to rely on on-line delivery is coming at a time when there is growing evidence to suggest that a majority of students have term-time access to an Internet connection away from the University premises. The matching of staff interest to student capability is no co-incidence. Rather, it is a strong indication of the professionalism and common sense of staff in waiting for the right circumstances before committing themselves and their students to an on-line learning experience. These circumstances undoubtedly include the increased simplicity of tools like the VLE Blackboard.

In the recent past there has been a tendency for so called pedagogists to be overly concerned that staff may in some way misuse the information technology revolution to 'sell' campus based students an inferior experience. Just as these fears are proving to be unfounded so too has the assumption that staff are fearful that ICT may put them out of work. All in all the common sense approach of the 'average' member of staff towards ICT, their eagerness to learn and try new tools, suggest a very positive overall attitude towards the

integration of technology into learning and learning support. So, where do the problems arise?

Most problems are inevitably related to using the technology. The reality at most traditional universities is that there can never be enough support staff to provide academic staff with the help they need <u>precisely</u> when they need it. This means that it is essential, if the strategy is not to limit learning technology to a select few, to have tools and systems that are foolproof.

Most staff and students know how to use a web browser. Therefore any system for the support of on-line learning that functions in that environment in a user friendly way, is likely to be successfully exploited. VLEs, like Blackboard, are almost foolproof and provide a host of features capable of re-vitalising the provision of learning opportunities to campus based students in the over crowded higher education system of the 21st century. However, simple to use tools can still be frustrating if staff have difficulty in accessing them reliably. So far, the major failure at Westminster has been the inability to allow eager staff and students reliable access to easy to use tools for the dissemination of information and on-line collaboration. To succeed in the projected learning environment of the future, 24 X 7 accessibility and usability of such tools and systems must be the target. At the moment UoW is not unique in falling short of this target.

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