

The Evolution of Learning Technology in UK Higher Education: The Bristol Solution

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Abstract

This paper is presented in two sections. The first will discuss the development of learning technology within UK higher education over the past ten years. It will outline the influences and expectations that contributed to these changes and the differing ways in which institutions dealt with them. The second section will outline how a traditional, research-based UK university, Bristol, addressed these issues of change and in what way the Learning Technology Support Service is developing its own strategy to support the University's learning and teaching. In particular it will focus on the results of a recent Learning Technology Survey circulated to all University academics earlier this year and how the findings of this survey will be used to inform planning and strategy at all levels.

Keywords

Learning technology, Learning and teaching, Strategy, Communication & information technology, Survey, Support, Staff development, Higher education, Teaching quality

The UK Context

Over the last ten years the demand for HE and lifelong learning has increased dramatically, not only in the UK, but throughout the world. The now widespread use of the Internet and email has almost certainly been a catalyst for these demands. Both these facilities opened up a whole new world of easy to

use technology where people of all ages and abilities communicate, investigate and more importantly, learn. In 1991 the University of Bristol took what was then a forward-looking step and established an Educational Technology Service within its campus (Longstaffe et al, 1996). It was one of the first British universities to establish this facility for its teachers. Since then the world of learning technology has transformed beyond all expectations. This paper will discuss the development of learning technology within UK higher education (HE) over the past ten years. It will outline the influences and expectations that contributed to these changes and the differing ways in which institutions dealt with them. In conclusion it will outline how a traditional, research-based university, the University of Bristol, addressed these issues.

The Early Years

The Computers in Teaching Initiative

In 1989 the UK Computer Board for the Universities and Research Councils established the Computers in Teaching Initiative Centres, or CTIs as they became more affectionately known. These were subject-based centres, each situated within a UK university campus. The University of Bristol was especially fortunate to host two of these, the CTI Centres for Medicine and Economics. The remit of the CTIs was to encourage the use of computers for learning and teaching. This, in the early days, was not an easy task. Very few teachers used or even had access to computers; the Internet was a mystery still to be discovered. Little by little breakthroughs occurred, enthusiasts enthused, the gospel according to CTI was spread and the word CAL (Computer Assisted Learning) entered the university teachers' vocabulary. By 1991 CAL was being seen as an essential tool for all teachers and not just the small minority. CAL was here to stay!

One of the earliest challenges to the uptake of CAL was the 'Not Invented Here' syndrome, where academics were considered reluctant to use courseware developed outside their own institutions. Interestingly a survey questionnaire sent to eight UK universities (designed to ascertain the seriousness of this syndrome), found that it was not as widespread as feared and that awareness and willingness to take on the new technology was relatively high (Laurillard et al, 1993). However, as could be expected in those early days, the main drawbacks to CAL were seen to be those of cost, access to equipment, technical assistance and lack of time to adopt the new technology. Another early problem was 'Reinvention of the Wheel' with enthusiasts developing similar courseware in differing locations. An early task for the CTIs was to address some of these problems.

Throughout the 90s the CTIs became involved with three other major projects funded by the UK Higher Education Funding Councils, further establishing and encouraging the wider use of CAL within higher education institutions (HEI). The first of these was the **Teaching and Learning Technology Programme (TLTP)**. TLTP's first two phases focused on developing new technology-based materials for learning and teaching (L&T) and exploring different approaches to implementation. Its third and current phase focuses on embedding the use of new technologies more firmly into HE and evaluating its effectiveness. In all 108 TLTP

projects have been funded. The **Fund for the Development of Teaching and Learning** (FDTL) continues to support projects aimed at stimulating developments in L&T and encourages the dissemination of good practice across the HE sector. FDTL was the first programme to link quality assessment results to the allocation of funds to the HE sector. Over the past seven years there have been three Phases of FDTL, covering 39 differing subject areas. Finally, the **Learning Technology Dissemination Initiative** was funded between 1994 and 1999 to promote the use of learning technology (LT) and computer-based learning materials in Scottish HE.

The Middle Years

By the mid 90s initiatives and projects supporting CAL (now referred to as 'Learning Technology' or LT) were being sited in a huge variety of institutional locations. In those early days no one really knew where to put them. Should 'they' go into Computing Services or in the School of Education as a central resource to support L&T? What about Staff Development or a subject centred department? Some institutions went so far as to get the architects in and design a whole new building for their LT service. Others tucked them into cramped attic rooms. And so a variety of services evolved, each with their own strengths and weaknesses.

Hughes et al (1997) categorise these differences as being:

- **Integrated:** strong structural links between units, or a section of one unit, which provides general L&T and IT-specific support.
- **Parallel:** separate units for general L&T support and support for using IT in L&T.
- **Distributed:** more bottom-up than the other two approaches. This typically consists of a range of units, centrally located and in faculties that are not tightly co-ordinated. Project management remains with the local projects.

1997 to 2000: The Pressure Is On ...

Pressure on the CTIs

In 1997 there was a major CTI review to determine the extent to which the CTIs had fulfilled their terms of reference, to capture some of the lessons learned and make recommendations for the future. The CTI Review was extensive, taking over six months to complete. The findings showed that:

- the CTIs had fulfilled their terms of reference;
- 88% of users surveyed described the service as good or excellent;
- 90% stated that changes made, as a direct result of CTI, would be sustained;
- there had been a paradigm shift to using the Web for teaching.

The downside showed that there was:

- under-utilisation of LT and Communication & Information Technology (C&IT)
- still a resistance to using Information Technology (IT) in teaching;
- less success in persuading middle managers to support IT at institutional level.

The results of the CTI Review fed into a national sector-wide review, the government's Report of the National Committee of Inquiry into HE, the Dearing Report, (NCIHE, 1997). This led to the subsequent consultation by the Committee on the promotion of L&T within the UKHE sector. The outcome of this was that all CTI centres were replaced by 24 subject - specific Learning and Teaching Support Network Centres (LTSNs) and one Generic Learning and Teaching Centre. These new LTSNs are designed to be broad-based, comprehensive one-stop shops and information gateways. Their emphasis encompasses all areas of pedagogy and not just IT. They are managed and co-ordinated by a newly established, Institute for Learning and Teaching (ILT) as a direct recommendation from the Dearing Review. The ILT is a membership organisation open to all those engaged in teaching and the support of learning in UKHE. Its principal aims and objectives are to enhance the status of teaching in HE; maintain and improve the quality of L&T in HE; and set standards of good professional practice. It has also established its own National Fellowship Scheme with eligibility broadly based on evidence of professional activity. This shift demonstrates ways in which LTs are becoming more embedded into the infrastructure along with other L&T techniques.

Pressure from Government

Following a radical change of government in 1998, and being keen to be seen to be 'doing something for education', the new Prime Minister set a target for one out of every two young people being able to enter UKHE by the time they reached 30 years of age. It is interesting to note that a year earlier President Clinton, in his Union Address, was also setting targets to ensure all Americans had the best education in the world "every 12 year old must be able to log on to the Internet; every 18 year old must be able to go to college; and every adult American must be able to keep on learning for a lifetime" (Clinton, 1997).

In February 2000, the UK Education and Employment Secretary, David Blunkett announced the launch of a major new project to harness new technology to high quality L&T, both in the UK and overseas, and the introduction of the Foundation Degree as a new vocationally-focused route into UKHE (Blunkett, 2000). Some interesting points in his speech included his call to HEIs to use global alliances to share resources, facilitate staff and student mobility and use new technology to spread excellence and that Universities needed to adapt rapidly to the top-down influences of globalisation and the new technologies. Perhaps, most importantly, was his statement that the "do nothing" universities would not survive - and could not expect the government to bail them out! Other national drivers include the establishment of a National Grid for Learning and the setting up of the University for Industry.

Pressure from the Funding Councils

Expanding on the push from government to encourage the development of L&T in HEIs, the Higher Education Funding Council for England (HEFCE) established the Teaching Quality Enhancement Fund. Over the next three years it will distribute £89 million to HEIs, with an additional £90m allocated to improve the capital and IT infrastructure of L&T. Funding will be directed to three specific strands:

- **Institutional:** to support HEIs in developing and implementing strategies to improve learning and teaching (L&T). Guidelines for this strand emphasise developing high quality staff (ILT membership) and innovations in L&T, especially in C&IT. To receive funding HEIs are expected to develop a ***Learning and Teaching Strategy*** with evidence of identifiable outcomes and activities.
- **Individual:** to reward and recognise individual academics who demonstrate excellence in L&T. Guidelines for this emphasise that HEIs will be expected to use part of the funding to implement their own reward and recognition schemes for high quality teaching.

- **Subject:** to establish and fund the LTSN Centres for five years and FDTL Phase III.

Pressure from the Quality Assurance Agency (QAA) for HE

The QAA was established in 1997 to provide an integrated quality assurance service to all UK HEIs. It is an independent body funded by subscriptions from universities and colleges of HE. Its mission is to promote public confidence that quality of provision and standards of awards in HE are being safeguarded and enhanced. To do this, the QAA, through a process now referred to as Subject Review, visits institutions every four years to audit their overall academic management, including arrangement for collaboration with overseas partners, and to assess the quality and standards of L&T at subject level. Results are made available to the public and are instrumental in the granting of degree awarding powers and university title. There is always strong inter-departmental competition within institutions to gain the coveted maximum 24 point award. Plans are now being implemented to replace the existing Subject Review process with a more integrated, paper-based approach. This will include the benchmarking of appropriate aspects of L&T, including C&IT skills, in each subject area.

In 1999 the Teaching, Learning and Information Group of the UK's Universities and Colleges Information Systems Association (UCISA) focused a national survey on the support given to teachers to achieve pedagogically effective integration of technology to support L&T (Armitage et al,1999). Over 90% of responses were from IT services or similar functions within Information Services. Four models emerged:

- **Integrated:** (44%) Specific post/s exist within Computer Service with some collaboration with other departments (eg Staff Development).
- **Collaborative:** (40%) a specific unit outside Computer Service has responsibility.
- **Integral:** (12%) No formally identified support. Support is only provided as an integral part of Computer Service work.
- **Consultative:** (4%) Little liaison or collaborative activity with a specific support unit. Responsibility lies outside the Computer Service and is seen as separate.

In many respects, this model is very similar to that outlined by Hughes et al, as detailed earlier. Of particular interest is the predominance of the Integrated and Collaborative/ Distributed modes. This section has identified the key drivers which have influenced the development of LT within the HE sector and provided a chronological review of their development.

The University of Bristol Solution: A Case Study

The University of Bristol is a traditional, research-based university of international standing, organising its academic affairs into six Faculties consisting of 60 departments and 15 research centres. These in turn host around 10,000 undergraduate and 2,000 post-graduate students. Entrance standards for Bristol are extremely high with 40% of its students coming from independent (private) schools.

Research in British universities is graded by the Funding Councils. The University of Bristol is assessed in 43 areas. In these same areas only the University of Cambridge gained higher ratings. At Bristol, research has always taken priority over teaching (research brings in money, teaching doesn't!). However, this does not mean that teaching is completely overlooked. As stated in the University Plan, its L&T aims are to: offer students the best possible learning experience in a research environment; ensure that the quality of L&T is a corporate concern; identify, encourage and reward good teaching practice across the University; monitor quality and demonstrate that appropriate quality assurance mechanisms are in place; ensure realistic workloads for students on all courses; produce graduates who are well fitted for their chosen careers. In support of its L&T Strategy the University has developed Guidelines which outline policy, procedures and good practice. These are supported by Faculty Quality Assurance Teams, who are supported by Faculty Teams and Departmental Advisers. The provision of LT support to all these now comes from the Learning Technology Support Service.

The Learning Technology Support Service (LTSS)

With continued encouragement from the government, all UK HEIs have, over the past ten years, seen a steady rise in student numbers. In many faculties and departments insufficient funding to cope with the increase has left teachers struggling with increased workloads. The University of Bristol, seeing the emergence of the new technology tools for L&T offered by the CTI Centres, took the wise decision, in 1991, to establish its own Educational Technology Service. In 1996 this service was renamed the Learning Technology Support Service (LTSS) and relocated on campus within the Institute for Learning and Research Technology (ILRT). The ILRT is a national centre of excellence in the development and use of Information and Communication Technology to support learning and research. At any one time it is host to 35-40 projects and services and 60-70 members of staff. Thus, the LTSS has a powerful and readily available source of expertise and resource to enhance its services to staff within the University.

As Bristol soon discovered, having an effective LT support service within its campus didn't automatically transform its teachers into users of technology. Indeed in some disciplines LT was not appropriate and the service was quick to recognise this. Despite the many LT enthusiasts within the University, there still remained a hard core of 'disbelievers', who to the LTSS became known as the 'if it ain't broke, don't fix it' brigade. Indeed, in some departments using LT was actively and rigorously discouraged. This was compounded by the fact that many departmental heads saw no reason to change when: Bristol's high calibre students would still attain a good degree, whatever the quality of teaching given to them; there was no problem recruiting teachers who wished to continue to use traditional teaching methods; there were no rewards for staff who implemented LT into their teaching practices; there were no acknowledgements for promotion; there was still not a lot of concrete evidence to prove that LT was as good as, if not better than, traditional teaching (and what there was could not be used generically).

With the recent introduction of student fees, students are increasingly expecting and demanding high quality and high technology lectures. We are now, at last, seeing a lot of these problems being addressed. Implementation of a University-funding mechanism, the Teaching Quality Enhancement Fund, has initiated an expansion of the University of Bristol's 1995 L&T Strategy. It now contains evaluation systems to

provide the Funding Council with evidence that its strategies and targets have been reached.

Service provision

The LTSS is a small team, consisting of four full-time equivalent staff, including administration. Its broad aims are to support and encourage appropriate use of technology in support of L&T strategies. It does this by involvement with:

- **Information provision:** provision of a comprehensive website, Help Desk, consultancy service, newsletter and electronic mailing list.
- **University-wide projects:** LTSS staff are currently evaluating computer-assisted assessment systems and virtual learning environments that may be suitable for university-wide implementation.
- **Staff development:** a broad range of staff development activities is offered, these include workshops, seminars, subject based training and events (open days, exhibitions).
- **Departmental projects:** involvement with small, subject-based projects.

The LTSS also prides itself on keeping abreast of national (and international) developments in LT, for example, along with the ILRT, it has strong links with the Association for Learning Technology (the UK equivalent of ASCILITE) and the new LTSN centres.

The LTSS Learning Technology Survey

One of the resources now being used to support and strengthen University of Bristol strategies are the findings of the LTSS Learning Technology Survey. The survey questionnaire asks respondents to detail how they use C&IT, and LT in particular. The aims of the survey are to guide the LTSS to better meet the LT needs of Bristol staff, and to better exploit the use of new technologies in L&T. The survey is also a key feature in the University's L&T Strategy, and will be used as part of the audit on the extent and type of technology currently being used in L&T practice within academic departments. The findings of the full survey will be used to develop more explicit guidance on good practice in the integration of C&IT in learning, teaching and assessment. The preliminary results of the study indicate that there is considerable work to be done in this area.

The preliminary results produced a few surprises, most notably the finding of relatively low usage of technology for L&T, even amongst those who have access to the required facilities, who are sufficiently skilled, and claim to be enthusiasts of technology at work. The survey questionnaire was widely distributed to academics throughout the University. Just over a hundred replies were received, primarily from those with a teaching and research background (93%). Overwhelmingly respondents had favourable opinions or attitudes regarding the use of C&IT at the workplace

(therefore considered more likely to respond to the questionnaire and possibly skew the results more favourably). In fact, over 90% claimed that they were either enthusiasts of technology, or that they 'quite liked it', or found it useful at work. Only 6% described themselves as reluctant users with, interestingly, not one claiming technology had no relevance to their work.

Despite these 'pro-technology' characteristics of the sample, the survey found that the respondents' use of computing technology in L&T was somewhat disappointing. In fact, only 37% of respondents were found to use C&IT in the teaching process, with slightly fewer, at 33%, making use of technology for teaching-related activities such as administration. While these figures may not at first sight appear to be spectacularly low, it should be remembered that they refer to usage among *enthusiasts* and those with a *positive outlook* on C&IT. Had the sample been drawn to more closely mirror the composition of the University as a whole (i.e. with a high statistical probability of the inclusion of many more 'non-enthusiasts', and thus more *reluctant* users of technology) then we could expect these figures to be much, much lower. Furthermore, it seems that factors such as restricted access to facilities, or lack of technical know-how, are highly unlikely to have contributed to this result. Overall access to computing and Internet technology amongst the sample was found to be relatively high, as was the confidence in one's own computing abilities (84%), and in the equipment itself (63%). All those staff surveyed had access to a PC, with the vast majority of respondents (91%) having exclusive, rather than shared, use of a computer. Access to the Internet was also high, with 94% of the sample claiming to make use of an Internet enabled machine.

The three most popular uses of computers at work were cited as communicating with colleagues, accessing information, and finding information or resources (at 99%, 98% and 97% of the sample respectively). A slightly less frequent response was communicating with students (82%) followed by publishing or disseminating information (56%). The use of technology for teaching (which is, after all, the main activity of the sample here) was found to be much lower at 37%. The preliminary findings therefore paint a somewhat contradictory picture, of a technically confident and competent staff, with an interest or even an enthusiasm in technology, and with no problems of PC availability or Internet access, but who also, on the other hand, appear to be making little use of that technology to enhance or improve their main work activities – ie L&T.

The question which therefore next arises is why this should be the case; why should confident, able, technology-friendly staff not be using technologies which should improve their working effectiveness and may even make their working lives a little easier? The survey findings in this area suggest an interesting disparity – of a relationship with LT in *particular*, being somewhat different than that with technology in *general*. When questioned about the factors which may limit or restrict their effective use of LT, most of the sample responded in a way to suggest a lack of familiarity with LT – in marked contrast to their earlier stated relationship (ie knowledgeable and enthusiastic) with technology in general.

Less than half the sample felt that they knew how to identify LT relevant to their work, with over two thirds 69% claiming that they needed training to help themselves use LT. In addition to this relatively low LT awareness, the factors of access to both facilities and support appear to be an issue – only 40% felt that they had sufficient access to the right kind of facilities to use LT, and just 37% felt that they had sufficient educational support to use LT effectively. Again, these seem to run contrary to the earlier reported findings of very high access to technologies and facilities. The final limiting factor in LT usage appears to be that of time – with only 23% claiming to have the time to create content for LT, and an even smaller proportion (16%) stating that they had the time to learn how to use LT properly.

In summary, one of the first findings to emerge from the preliminary survey is the apparent disparity between willingness to use technology and actually putting technology to use for purposes of teaching; even though the sample consists of technology enthusiasts and those who are comfortable in its implementation, the use of LT for teaching is relatively low. Furthermore, there seems to be a contradiction between respondents relationship with technology and that with *learning* technology. Although the vast majority of the sample appear to be keen, willing and able to make full use of technology at work, this does not appear to be the case when technology is applied to teaching, the majority of the sample claiming to have relatively low levels of knowledge and awareness of how technology can be best applied to enhance the L&T process.

These initial findings indicate that subsequent research may be required to better understand the reasons for the above disparities, of why high levels of skills, confidence and access to technology do not appear to apply when

technology is used for L&T. Moreover, the findings relating to limiting factors indicate that an increase in LT usage may be related to an accompanying increase in the amount of time allowed for learning to use, and how to create content for, LT. They also suggest that increased LT use may be encouraged by providing an increased level of support for its implementation, or by raising the awareness that such support already exists within the University. The Bristol LT survey was based on a national Scottish survey executed by TALiSMAN, a staff development initiative funded by the Scottish HE Funding Council. Results from this survey were used to analyse the training needs of academic and research staff in Scottish HE during 1997 (Tomes and Higginson, 1998). It is interesting to compare similarities in the data between the Bristol survey, carried out this year (2000) and based on data collected from 102 pro-technology respondents, to those of the TALiSMAN survey, conducted three years earlier (1997) and based on data taken from 627 respondents across Scottish HEIs (see Figure 1), especially those indicating using LT to teach (27% and 37%) and time being a barrier in the uptake of LT (78% and 77%).

Data topic	Bristol	TALiSMAN
Respondents with teaching or research background	93	84
Access to PC	100	99
Access to PC and network	94	70
Communicate with colleagues, gather info, find resources	98	85
Communicate with students	82	55
Use LT to teach	37	27
Use LT for teaching-related administration	33	27
Confident in using LT	84	80
Need for basic training in the use of LT	69	54
Time is a barrier to the uptake of LT	77	78

Figure 1. Comparison of the University of Bristol and TALiSMAN surveys

The Joint Information Systems Committee has recently commissioned a national audit of the dissemination, roles and functions of LT across the UK. The results of this are due to be published in Autumn 2000. A summary of these will be presented, along with this paper, at ASCILITE 2000.

The Way Forward

Tools such as the LT Survey help to inform and develop LTSS's own strategy when planning their support activities.

Top-level: The LTSS needs to have a strong input into institutional strategies that can affect constraints faced by teaching staff, ie lack of technical facilities for teaching, little or no reward for developing innovative and appropriate LT approaches to teaching, no time for training in this area. To this end the service has recently set up an Advisory Group, comprising academics and key stakeholders, that reports directly to the University's L&T Group; a University working group that is responsible for the L&T Strategy. The service is also seeking representation on other key committees, eg the University Information Systems Committee.

More effective use of resources: As a small team, the LTSS is limited to the amount of support it can give. Targeting of certain key groups for focused training and support could help to improve the level and consistency of support. In particular Departmental L&T Advisers and Computing Support Officers, who often find themselves at the forefront of LT support and implementation. Strong links with national initiatives, such as the LTSN centres and other educational institutions, can also improve support, providing more specialist subject input and a broader range of expertise.

Convincing research: Comments from both enthusiasts and reluctant users at the University call for more convincing research to prove LT is 'better' or enhances L&T. In order for the University to move forward at all levels (from convincing senior management to individuals), solid research results need to be presented to add weight to LT's case. LTSS is actively involved in evaluating and sharing LT project results throughout the University (and beyond) but will also seek external funding to become further involved in research, especially in a traditional campus-based environment.

Conclusion

As this paper demonstrates there have been many changes in learning technology over the past ten years. Many of these have presented teachers with challenges and demands that have fundamentally changed their established teaching practices and roles. As a university service, the LTSS has had to support these teachers and encourage them to implement these changes. Today, national drivers and initiatives continue to assist us to embed these new approaches into standard university learning and teaching. Who knows what changes the next ten years may bring!

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