

Commission of inquiry into the future for lifelong learning

Expert seminar on lifelong learning and technological change

A paper by Becta

Becta works with schools, colleges, training providers and universities to help them apply technology innovatively and effectively in teaching, learning, management and administration. The evidence shows clearly that, used properly, technology can have a huge impact. Becta's aim is to ensure that, through technology, students of all ages and abilities enjoy a stimulating and rewarding experience and succeed in their ambitions. The government has asked Becta to update 'Harnessing Technology' (the national e-strategy for learning and children's services) and the plan is to consult and then publish a series of delivery plans later this year. As part of this, Becta expects to publish an implementation plan for further education, skills and regeneration very shortly.

Introduction

1. This paper aims to prompt discussion rather than to undertake a rigorous examination of evidence. It briefly sets out the current situation and raises some of the major issues to be considered in the use of technology in education¹.

2. Becta welcomes the Commission of Inquiry established by NIACE. It is undertaking an important piece of work at a key time. In the last decade or so we have seen the growth of global markets, the spread of technology, changing societies and, most recently, the shifting of economic power. In all that time the call has been long and loud for the skilled, knowledgeable and motivated people who will be able to operate effectively in these fast-developing conditions. The acquisition of skills and knowledge is also universally agreed to benefit individuals in terms of their personal development and fulfilment, health etc and thus, by extension, to benefit their families and the wider community. As David Blunkett wrote in his influential foreword to the 1998 Green Paper, *The Learning Age*:

We stand on the brink of a new age. Familiar certainties and old ways of doing things are disappearing. Jobs are changing and with them the skills needed for the world of tomorrow. In our hearts we know we have no choice but to prepare for this new age, in which the key to success will be the education, knowledge and skills of our people. Learning is the key to prosperity - for each of us as individuals, as well as for the nation as a whole.

3. There is another, rather different, reason why this Commission, which seeks answers to fundamental questions about the delivery of lifelong learning, is timely. The further education system on which very large numbers of people rely for both vocational and personal learning has been experiencing considerable change since at least 1993 (from incorporation through changes in funding regimes and major initiatives such as 14-19) and this is likely to continue with the introduction of the demand-led environment, the machinery of government changes and of course the current – and very welcome – government consultation on the future of informal

¹ The term 'education' is used here generically, to cover all types of institution from early years to university, from the public to the private sector. Similarly, the word 'provider' is variously used, according to context, to refer to schools, colleges, adult learning and work-based providers, universities etc.

adult learning². It is worth noting at this point that during the period in question standards and performance have on the whole risen considerably (from in some cases relatively low baselines) – a tribute to providers of all types.

4. The choice of technology as one of the factors to be investigated by the Commission is also welcomed by Becta. Technology is transforming every aspect of our lives, with mobiles, broadband, digital kit becoming cheaper and easier to use and more powerful in application. We increasingly rely on it in the home, in business and industry and in public services. The transformation we are experiencing will not slow down anytime soon - indeed, the pace of change will probably increase with nanotechnology, Web 2.0 and other developments all coming up fast. (It is important, of course, not to over-estimate the contribution of technology but it is generally agreed that in the right circumstances it does have huge potential to make the lives of millions of people better.)

The growth and spread of technology

5. In the UK, we have made particularly good progress in adopting technology in recent years (although we are not by any means unique in this and indeed other countries remain ahead of us). In 1999, only one in ten households had internet access and this access was reckoned to be one of the most expensive in the world. Internet users were predominantly young, male and rich. Our broadband market was virtually non-existent (with take-up of 0.1 per cent, putting us in 24th place out of the 32 OECD countries). The UK was sixth among the G7 countries for business use of technology. But this has changed dramatically in the new millennium. 61 per cent of all households now have an internet connection (with an increase of 7 per cent in the last year). Google, Wikipedia and YouTube have entered the language and each of them has between six and seven million users in the UK. Business usage of the internet and broadband now compares favourably with other OECD countries (for example, in 2006 over 90 per cent of UK business³ had internet access, almost 80 per cent had broadband and the same percentage had their own websites. This compares well with other OECD members).

6. Like everywhere else, the world of education has adopted technology. The days of copying notes by hand from blackboards and gazing at hand-drawn overhead transparencies are long gone. Technology is routinely used by all types of provider. In 1999, there was on average one computer for every eight full-time learners in a college; by 2007 nine out of ten full-time learners said that it was 'always' or 'usually' possible to get on an internet-enabled computer in college. Technology makes possible management and administration; and it offers a means of rapid communication and an information resource across an institution. It has also opened up teaching and learning - allowing almost instant access to research, content and resources from across the world; enabling ongoing communication between teachers and learners, including real time reporting⁴; and facilitating personal study at a time and place chosen by learners. Internet and email, personal laptops and digital devices, simulators, Activboards, broadband and connectivity – all these and much more are commonly used.

7. The use of technology in education will of course continue to grow, as

² www.adultlearningconsultation.org.uk/

³ Businesses with 10+ employees. Taken from OECD science, technology and industry scoreboard, 2007

⁴ In parallel with this, Jim Knight announced in January 2007 that all parents would get regular electronic reports on their children's progress in future, with all secondary schools expected to have 'real-time' reporting by 2010 and all primary schools two years later.

industry develops more powerful yet relatively cheap and easy-to-use devices⁵. We can expect to see a very different education world in the near future: a world without barriers, where learners expect their own technology to interface easily with their provider's, where the lecture has given way to the podcast, where it is as easy to study online with a provider in the USA or India as at the local college.

8. Individual learners and businesses buying training are helping to secure the position of technology in education by expecting and even demanding better online delivery or resources. The majority of school pupils already voluntarily use technology at home and probably cannot imagine learning without it. Many learners aged 14 or over report learning through the internet; of those surveyed, 52 per cent go online to find out about opportunities to learn and 22 per cent use distance learning for an academic degree or job training. Employers favour online learning because it can be tailored to their needs and is seen as fast, flexible and cost-effective. In the current climate, we can expect these trends to continue.

The payback

9. The use of technology in education pays off. Becta's research⁶ shows that there is a 'technology premium'. Properly deployed, technology makes a real difference to the experience of learners and employers and the efficient operation of providers. In brief:

- Technology enables people to engage with their learning, motivating and encouraging them to stay the full course. One survey showed an increase in learner satisfaction from 50 per cent to 99 per cent, and tutors reporting that learners directed their learning trebled to 47 per cent.
- Technology accelerates and deepens learning and improves progression and attainment. We have large scale case study evidence showing that where technology supports pedagogy, subject understanding improves and learners increasingly use online resources to 'fast-track' through courses.
- Technology supports more efficient delivery, doing things better and offering learners more choice. The integration of information systems can reduce workloads and deliver cashable savings. Blended and online delivery can produce reductions in unit costs.
- Technology promotes more flexible learning. Employers cite increased flexibility as a key reason for adopting an approach based on technology.

The downside

10. If we stopped at this point, there would perhaps appear to be no problem. We might assume that we are living in a Utopia where technology meets the needs and wishes of all learners, their employers and their course providers. The truth is rather different. For all the 'switched on' individuals, businesses and providers, there are many who are not as fortunate. Technology is unusual among the environmental factors affecting education in that it presents both

⁵ Developments likely to impact on education include, for example, green technology (eg, in power usage and manufacturing hardware); virtual worlds (WEB 2.0) advancing social networking; exponential growth in the use of hand-held and mobile devices; grassroots video using inexpensive equipment and software; mobile devices which can access most internet content; collaboration webs (undertaking group work, holding online meetings etc - made easier by new, flexible equipment); connectivity with increased bandwidth; and multi-media and multi-modal content.

⁶ See Appendix A for a fuller examination.

solutions (eg, VfM; flexibility; inclusion; transition; accessibility; and personalisation) and challenges (eg, access; workforce skill levels; system interoperability and links; and procurement).

11. Within society as a whole, we have a digital divide – there are technology ‘haves’ and ‘have-nots’. Age, income, social class, geography and literacy levels have a real impact on access, familiarity, skills and thus expectations in relation to technology. For example:

- The ownership of technology is linked to socio-economic status, with more computers per household found amongst families in social groups AB than in DE.
- Home internet access is more common amongst higher-income groups, with children from middle class families (88 per cent) being much more likely than working class pupils (61 per cent) to have accessed the internet at home.
- Families without a home computer often cite cost or fear as barriers.
- In 2007 two English regions, Yorkshire and Humber and the North East, still had 48 per cent of households with no internet access at all, compared to only 31 per cent of households in the London and South East regions.

12. We know too that technology is not always used as well as it might be in education. Research tells us that in the further education system colleges and providers are gradually growing more confident and sophisticated in their use of technology but that overall the system lacks capacity and capability⁷. We know that around 25 per cent of colleges are ‘e-enabled’ and some 50 per cent are developing their capacity and capability. But the remaining 25 per cent are ‘ambivalent’ or ‘late adopters’. In work-based learning, 22 per cent of providers have embedded e-learning and some 60 per cent describe themselves as ‘novices’ or ‘developing’ users of e-learning. Most adult learning providers are described as ‘on the lower rungs of the e-maturity ladder’, although NIACE evidence shows that the majority are now monitoring their progress.

13. Typical problems include: providers using systems which are not interoperable; no systematic approach to procurement; and low skill levels among the workforce. Broadly speaking, these problems can lead to: poor VfM and lack of sustainability; poor communication and interface across organisations; poor learner services; inflexibility and inaccessibility; inefficiency; inconsistent data collection and analysis; and teaching and learning which is narrower in range than it need be.

14. If, for example, we look at the PCDL [personal and community development learning] part of the further education system in more detail, we find:

- skills in teaching and facilitating online are limited
- off-site provision for learners is variable
- the use of personalised learning space is limited.

⁷ The situation is discussed briefly in paras 11-13 and in greater detail in Appendix B. The assessment is not meant as a criticism of the further education system as a whole or of any part of it. There have been great strides forward, but as with any complex and fast-changing situation, there is much to be done and doing it is challenging.

- staff report that their own development is the ‘most fundamental’ issue

15. Technological advances (such as WEB 2.0, shared and open source content, virtualisation, environmentally-friendly practices and the increase in hand-held devices) will have some impact on both the digital divide and on the use of technology in education. Similarly, the reductions in cost etc as devices become cheaper to produce and more common will be influential. However, these factors are unlikely by themselves completely to remedy the situation.

16. It is important of course to remember balance in all this. The use of technology is not an end in itself. Nor is it an all-encompassing approach meaning that more traditional techniques should be abandoned. Technology should be seen as an enabler, as one ingredient in a complex mix.

Where to go from here?

17. It is clear from the discussion above that technology could make a significant contribution to participation and achievement and thus to economic growth, social cohesion and personal development and prosperity. Indeed, technology has already proved effective. In addition, it is widely available, is developing (almost too) fast and is in demand. However, for often understandable reasons, it is not always deployed as effectively or creatively as it might be. Commitment and expertise have to develop and time and resources have to be invested. Organisational practices, processes and structures and how they interact with staff and learners have to be tackled. We have yet to find answers to questions like:

- how can providers of all types capitalise on the potential, ensuring that technology delivers real gains for every single learner?
- how can we ensure that the impact of technology is positive, not negative and that providers and their staff do not fall behind their learners’ expectations?
- how can staff engage with learners, manage resources and design the curriculum in a world where today’s geographical, physical, temporal and cultural boundaries are no more?

18. Becta wants to see:

- providers understanding technology and making strategic investments
- staff who are confident and skilled in deploying technology
- discriminating learners and employers choosing what, where, when and how to learn in a safe and secure environment⁸
- teaching and learning supported by fit-for-purpose technology
- intelligent buildings and transformed learning spaces
- business systems made effective and efficient through technology.

⁸ The recent publication of *Safer Children in a Digital World* by Dr Tanya Byron (<http://www.dfes.gov.uk/byronreview/>) examines online safety issues. Becta welcomes the call for safe and secure environments for both children and adults (including particularly those who are vulnerable).

All this will lead to better outcomes and services for learners and employers through a mixture of face-to-face, blended and online learning and – not to be forgotten - efficient ‘backroom’ operations. Our strategy will embrace the power of technology to change the ways that people can learn independently and providing a ‘next generation’ of skills and training for all. So whether people are taking a full-time course leading to a vocational qualification, doing some non-accredited learning in the workplace (which is on the increase these days) or learning at home out of love for a particular subject, technology will make their experience a richer and more rewarding one.

19. Becta’s updated ‘Harnessing Technology’ strategy - to cover the period 2008-2014 - and the related technology strategy for the further education system will enable providers to address these issues. The further education strategy will help colleges move from ‘e-enablement’ (ie, equipped with technology) to ‘e-maturity’ (ie, technology embedded in delivery and process) and on to ‘e-confidence’ (ie, technology delivering better outcomes). For example, the strategy will include⁹:

- a systematic national professional development programme and regional support for workforce and leaders in the effective use of technology
- learning opportunities through technology for the ‘digitally excluded’, for disadvantaged learners and for small businesses
- system-wide National Digital Infrastructure including interoperable business and management systems
- a focus on high quality content to drive up the standards of digital resources and to increase their range and access
- professional workforce standards.

Becta is building on the experience and expertise of the further education system to develop a technology strategy and working with providers and national agencies such as the Learning and Skills Council and Quality Improvement Agency.

20. Finance is an important issue not previously discussed. Some £300 million has been invested by the government since 1999 to embed technology in the further education system and this figure has been quadrupled by providers’ own investment. These types of investment are likely to continue while there is evidence of payback and government priorities remain broadly the same. However, it is certainly the case that some providers do not invest on the scale necessary, or that their money is not well-spent. There is also a question about individual investment. For the technology ‘have-nots’, cost is an obstacle and it may be that national intervention (such as some form of targeted support) is required.

Interested?

21. If you want to read more, visit www.becta.org.uk or www.futurelab.org.uk If you want to know more about Becta’s strategy for FE, email feskills@becta.org.uk

Becta
Further Education, Skills and Regeneration Directorate
April 2008

⁹ Appendix C lists the key priorities for the strategy.

Appendix A: The technology premium

There is a growing body of evidence which strongly supports the case for further building of technology capacity and capability across the further education system. Benefits include:

Improved engagement and retention of learners

- In the ICT Test Bed¹⁰ student satisfaction with learning rose from 50 per cent to 99 per cent, and tutors who reported that students took a leading role in directing their learning trebled to 47 per cent. Key reasons cited were use of online individual learning plans and portfolios, increased quality and accessibility of learning resources, and better lesson pace and presentation. Nationally, in colleges where achievement and retention have improved, 54 per cent of tutors reported that ICT and e-learning contributed to improved achievement, and 41 per cent to improved retention¹¹.

Acceleration of learning and improved progression

- Large scale case study research found that, where technology was deployed in a pedagogically-informed way to support learning¹², subject understanding was improved across the further education system. In addition, in these contexts students increasingly use online resources to 'fast track' through courses. Some ICT Test Bed students used online resources from home to enable them to complete learning activities early. Pupils studying Key Stage 2 maths, science and English in schools making the best use of technology improved at twice the national average.

Efficiencies in delivery, in terms of:

- Differentiation of experience to support varied learner needs without increased cost. Where relatively sophisticated approaches to technology-supported learning are embedded, practitioners are increasingly adapting commercially-provided subject software and other online resources to create individual work plans for students¹³. Also, particularly in 14-19, schools and colleges are working together to offer a broader curriculum through a mix of classroom-based and online modules (for example the Open University¹⁴).
- Workload reduction and cashable savings through integrated information systems. US evaluations in schools suggest time savings of between one and eight hours per student per year, depending on context, regional/state role and range of tasks¹⁵. Becta found time spent in colleges recording and analysing student achievement could be reduced by half by using integrated systems¹⁶, saving an estimated 1880 hours per college year.
- Reduction in unit cost per learner through blended and online delivery. A key benefit of online learning, which commonly incorporates a significant element of resource-based learning, is that it is scalable, affording capacity to meet increased student demand. Employers recognise this potential, with 49 per cent reporting implementing e-learning in order to reduce training costs¹⁷, and there is an increasing body of corporate sector case studies demonstrating return on investment from e-learning¹⁸. In education, a

¹⁰ Somekh et al (2007) Evaluation of 2003-6 ICT Test Bed programme to develop e-maturity in 3 FE colleges and 28 schools across LAs in 3 disadvantaged areas

¹¹ Golden et al (2006) Impact of e-learning in FE: study of scale and breadth

¹² Findlayson et al (2006) e-Learning in FE: the impact on student intermediate and end-point outcomes

¹³ Somekh et al (2007) and ICT Test Bed evaluation case studies.

¹⁴ Monkseaton case study Schemeta/Becta (forthcoming) ICT and 14-19 Curriculum Choice

¹⁵ NC district enrolment and registration system for student system student cards, library & cafeteria; Wyoming state reporting system data provided by SIMS

¹⁶ PwC (2005) Impact of ICT on productive time

¹⁷ e-Skills UK (2007) Towards Maturity: insights for employers and training providers

¹⁸ e-Skills UK employer stories

strategic US programme to implement e-learning in 30 higher education courses reduced delivery costs by between 20 and 80 per cent¹⁹. Differing approaches were adopted, ranging from using technology purely to support out-of class activities to full online learning, but the common feature was planned and co-ordinated redesign of courses with quality improvement and cost savings as objectives.

Flexibility in learning, for example, for work-based learners and supporting 'just in time' learning

- 73 per cent of employers using e-learning report that increasing flexibility in providing training is a key reason²⁰. Employer case studies universally cite the value of e-learning in terms of flexibility of delivery and associated benefit in terms of business delivery. An increasing number of cases recognise the value of a 'just in time' capability enabled by online learning²¹.

¹⁹ Twigg (2005) Evaluation of PEW e-learning programme

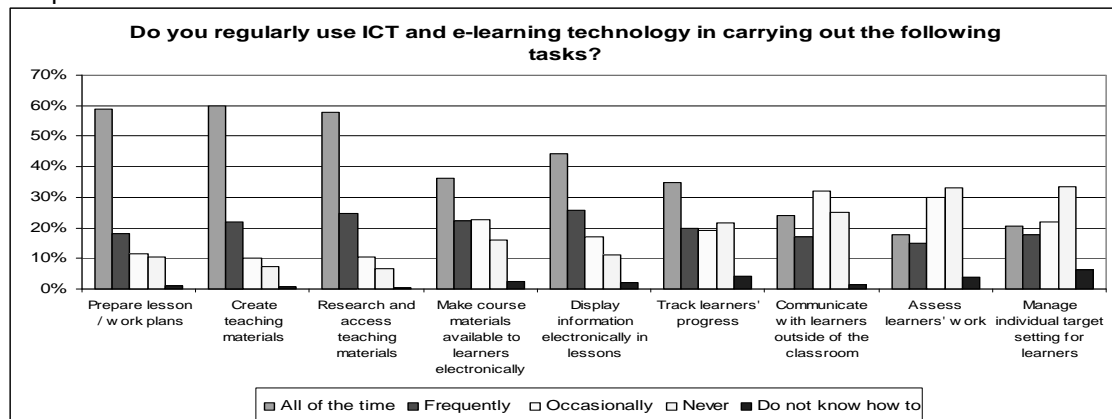
²⁰ e-Skills UK (2007) Towards Maturity: insights for employers and training providers

²¹ e-Skills UK employer stories

Appendix B: The use of technology in the further education system

- Further education is characterised by positive developments in technological capacity. For example 64 per cent of providers describe their network as 'fast and reliable, allowing users to access relevant off site resource'.
- Research into learner attitudes and perception also suggests the use of technology for learning now features in the experience of most learners.
- However, the research evidence suggests it is too early to say that e-learning is fully integrated into teaching and learning processes. The more advanced use of technology (eg, computer based assessment) is less widespread, with only 11 per cent of learners using technology all the time to support collaborative work with other learners, face-to-face or online.
- The level of equipment in colleges is generally good: a total of 89 per cent practitioners think their provider's technology effectively meets requirements for management and administration.
- However, practitioner research findings show 57 per cent of respondents thought that the capacity of the technology infrastructure to meet learner demand for computers was lacking.
- The potential for using technology in more interactive and advanced ways is currently under exploited (see below Graph 1 FE College practitioners).
- Target setting, assessing work, communicating with learners outside the classroom and tracking learner progress are less effectively utilised than the more standard features of researching and accessing teaching materials and creating teaching materials.

Graph 1



- Surveys have shown growing numbers of colleges with a VLE (over 80 per cent have a learning platform). However the use by learners is more limited – the technology exists but utilisation does not (only 27 per cent of learners said they were required to use a platform).
- There is also a disparity between learner and institution based perception of access. Learners feel access is less of an issue than the institution with only 7 per cent of learners saying it is difficult to get on to a computer at college.
- There is evidence to suggest that a significant proportion of learners are using computers at home, raising the question whether providers actually need the level of computers they perceive they require.

How is technology being used to support learning?

Colleges

- 46 per cent of colleges report that a virtual learning environment is the main

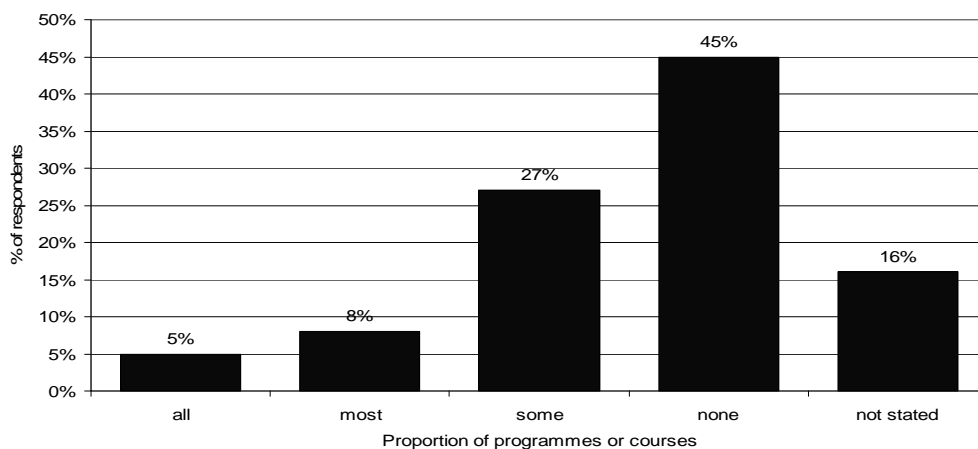
platform they use (with 32 per cent saying they use it frequently even though it isn't their main platform).

- Providers report some access issues, e.g. 32 per cent of colleges reported capacity does not always meet demand for computers, with 36 per cent saying that capacity does not always meet demand for teaching and learning.
- Staff capability is developing but has still some way to go. Most staff possess intermediate level skills (eg, 81 per cent of colleges felt that between 26 and 75 per cent of their staff held intermediate skills) but the comparable figure for advanced level skills is 13 per cent.
- 60 per cent of practitioners never use technology to assess learners work or only occasionally. Over half never or only occasionally use technology outside the classroom to communicate with learners.

Work-based learning

- In terms of infrastructure only 16 per cent have a VLE and 32 per cent a dedicated website to support work based learners. Only 14 per cent of providers use technology to assess employer needs.
- Only 26 per cent of providers use technology to help learners monitor their own progress, with only 23 per cent to support collaboration between groups and 19 per cent to support learner progression.
- 37 per cent of providers believe future income or cost savings will cover the cost of e-learning resources; 49 per cent don't know.

Graph 2: Approximately how many of your programmes include an online learning space allowing learners to learn when and where they choose? (WBL e-maturity research Becta 2008 - unpublished)



PCDL

- Skills in teaching and facilitating online are still limited, and off-site provision for learners is very variable, including technical support for learners when off-site. The development of personalised learning space is limited within the sector, and there is little tracking of learner progress using technology.
- Staff development is self-assessed as the most fundamental problem despite recent investments and policy interventions. At the root of this are high numbers of part-time staff, high staff turnover, uncertain funding and the nature of employment contracts.

OLASS

- In one survey a large number of respondents said that internet (66 per cent)

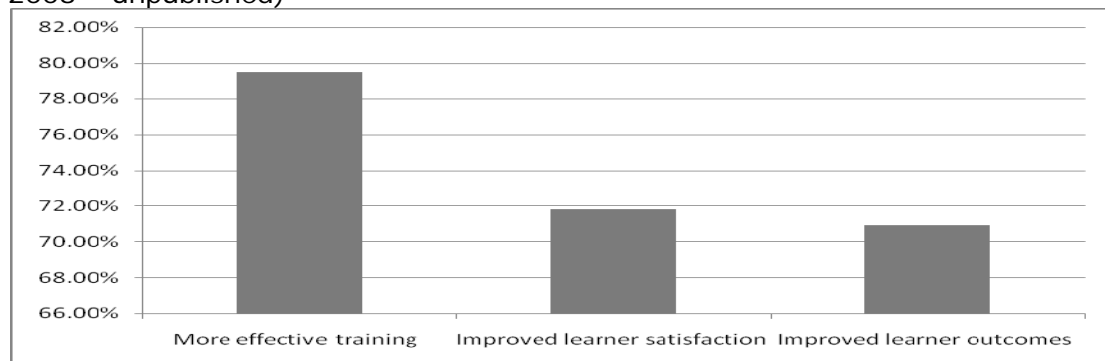
and VLE (58 per cent) were not available but that they would use them if they were. Most significantly, 85 per cent of respondents thought current access to internet was inadequate for requirements, and 45 per cent thought computer resources inadequate.

- As for staff development, 46 per cent of respondents rated their basic technology skills as 'advanced', and a further 42 per cent thought intermediate.
- Approximately 18 per cent said they never used technology for teaching and learning. Some 40 per cent never used it to 'manage their workload'.

How successful is the use of technology?

- There is considerable evidence for significant impact from e-learning initiatives, including learner motivation, satisfaction and retention:

Graph 3: Impact of ICT and e-learning at colleges: (College e-maturity research 2008 – unpublished)



- Learner feedback research shows 75 per cent of learners as either confident or very confident about using computers, with learners on full time courses more confident than learners on part-time courses. At least 40 per cent consider themselves expert in communicating with other people and finding information on the internet, with approximately 25 per cent saying they were experts in word processing.
- 84 per cent of learners had access to a computer at home that they used for their college course, with 94 per cent saying they had internet access.
- Approximately 63 per cent of learners agreed that it was essential to use a computer to learn, but about the same proportion said they used computers because they had been directed to do so by their tutors.
- VLE usage was low (27 per cent), with even fewer required to use e-portfolios. But those using them found them helpful.
- Feedback suggests 65 per cent of learners did better in assessments as a result of using computers. A similar proportion (66 per cent) said because of the way computers were used on their course they have more choices about where and when they can study.
- Only 53 per cent stated that using computers motivated them to study and a similar proportion (55 per cent) said they did not rely on computers to keep in touch with other learners on their course.

Employer perspectives

- Eight in ten employers said e-learning provides a uniquely accessible, flexible and cost-effective delivery method. It is used to support training in a wide range of skills, including communications, leadership and management, foreign language training, IT, health and safety and a wide range of company specific projects.

Appendix C: Becta's strategic priorities for further education

A further education system that is fully confident in the use of technology

- Systematic national professional development programme and regional support for workforce and leaders in the effective use of technology.
- A supported network of business leaders who will be advocates for flexible and online delivery.

Equity and social cohesion

- Learning opportunities through technology for the 'digitally excluded', for disadvantaged learners and for small businesses.
- A campaign (Next Generation Learning) to raise awareness of, and increase demand for, learning through technology.

Raising the quality of technology products and services

- A system-wide National Digital Infrastructure including interoperable business and management systems.
- Aggregation of procurement leading to better value for money, with cashable savings.
- A focus on effective use of high quality content to drive up the standards of digital resources and to increase their range and access.
- Reviewing the delivery chain for technology investment.

Accelerating quality improvement

- Considering how the effective use of technology might best be embedded in any revision to the inspection process.
- Initial scoping to see if the incentives are right for delivering technology-based services.
- Professional workforce standards for the skills needed by practitioners in the effective use of technology both in teaching and learning and for efficient business processes.