RESEARCH INTO THE USE OF ICT AND E-LEARNING FOR WORK-BASED LEARNING IN THE SKILLS SECTOR

Final report

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Acknowledgements

CONTENTS

Executive summary

Context

1. In a progressively more competitive global economy where there is continuous technological change and rising customer expectations, 'sustaining a competitive, productive economy which delivers prosperity for all requires an ever-growing proportion of skilled, qualified people' (DfES, 2003b).

2. Government, employers and training providers are increasingly recognising that e-learning has a potentially important role to play in developing and maintaining the skills required by the workforce. This research has been commissioned by Becta (funded by the LSC) to provide an evidence-based overview of the current use and effectiveness of work-based e-learning and its integration with more traditional learning methods. The aim is to inform future policy and the activities of Becta and its partners. The specific objectives of the research are to:

- investigate the known impact of ICT and e-learning on the skills sector
- establish and describe the ways in which ICT and e-learning can support key workforce development issues such as addressing skills gaps and achieving sustainability in training and development
- report how ICT and e-learning can and is helping particular industry sectors
- identify gaps in provision
- identify where further work is needed to promote and embed the effective use of ICT and e-learning.

3. We have defined the scope of the research by adapting the Pollard and Hillage (2001) definition of e-learning. By 'work-based e-learning', we mean: 'The delivery and administration of learning opportunities and support via computer, networked and web-based technology to help individual performance and development, undertaken in or linked to the workplace.'

4. This report presents the findings of the first phase of a three-phase research project. Phase 1 has involved:

- a literature review covering more than 200 source documents
- desk research and follow-up interviews with key stakeholders and work-based e-learning providers identified in the literature review
- five in-depth case studies of established work-based e-learning projects.

Main findings

5. Our review of the strategic framework for skills development and e-learning suggests that the potential for e-learning to make a positive contribution to work-based learning has been recognised. In addition, a number of changes in public policy will provide the opportunity for e-learning to prove its value. These include:

- better co-ordination of post-16 e-learning policy and implementation and its integration into existing activity. This will help to ensure that the value of e-learning in the workplace is understood and that any e-learning developed is sustainable.
- a greater focus on demand-led, publicly funded, work-based learning provision. This new focus is likely not only to lead to an increase in the demand for work-based learning, but also an increase in demand for short-term, focused, flexibly delivered learning provision. This is the type of learning that many commentators believe can be delivered effectively through e-learning.

- the introduction of a credit-based qualifications framework. This will make it easier for short-term, employer-focused, flexible learning to be recognised as part of a qualification and, as such, will make it easier for the public sector to prioritise and fund it.
- the introduction of e-assessment could reduce some of the barriers to learning by allowing assessment to be undertaken at a time and place to suit the learner. It can also provide more immediate feedback and provide alternative assessment opportunities.

6. In general, industry commentators agree that there is an increasing take-up of e-learning, particularly among larger employers, but that growth has not been as great as expected over the last few years. It is important to highlight that this view is based on fragmented and patchy evidence; there is little unbiased, consistent data to illustrate the extent of this take-up or recent growth. However, analysis of the summer 2004 Labour Force Survey (Office of National Statistics, 2003–04) shows that 12 per cent of employees who had received training in the previous four weeks had received training that included e-learning.

7. While there is some disagreement over its extent, it is likely that e-learning uptake will continue to grow. For example, a survey of 150 large companies by Skillsoft (Anon., 2004b) found that 96 per cent agreed that their use of e-learning would increase over the next two to three years. Particular trends identified by our research include:

- the use of new technologies as they become available and as new methods of delivering e-learning are identified. A Chartered Institute of Personnel and Development (CIPD) survey (2004) found that 58 per cent of respondents feel that the current generation of e-learning products does not demonstrate what the future will look like.
- the wider use of simulations and other learning methods such as games, in work-based e-learning. The International Data Corporation (2004) estimates that 8–10 per cent of the US corporate e-learning market uses technology-based simulations and predicts that this will rise to 40 per cent by 2008.
- the increasing integration of technology-supported learning with more traditional learning methods, sometimes described as 'blended learning'. Research with 300 American and UK companies (Balance Learning, 2004) predicts that blended learning will comprise nearly one third of corporate training by 2006.
- greater customisation of e-learning to meet the needs of specific sectors, occupations or businesses. A CIPD survey (2004) found that 54 per cent of respondents were developing customised e-learning modules rather than buying off-the-shelf packages.
- an increasing focus on using e-learning to improve the effectiveness of learning rather than on reducing costs. Larger employers are increasingly taking into account reduced costs as a result of better-trained employees and improved performance as well as any potential to reduce training delivery costs.

8. We found little literature summarising the use of work-based e-learning and its impact other than that reported in the corporate sector, but we did identify a great deal of reporting of individual work-based e-learning projects. This suggests that a large number of different learning providers are delivering different types of work-based e-learning in diverse settings.

9. We are unclear to what extent these activities are mainly small-scale pilots or large-scale and long-term implementations. Our view is that many are the former. Work-based e-learning is still relatively young, and providers and employers are still trying to identify how it can be used most effectively to increase the value of learning in the workplace.

10. We identified a number of challenges in relation to the implementation of work-based e-learning. These include:

- the lack among employers, particularly SMEs, of an awareness and engagement with e-learning. There is a need to link it to the specific requirements of the business and to understand the drivers of business change. For example, an evaluation of the

learndirect Northern Ireland Small Firms Growth Plan found that one of the main motivations for the micro-businesses participating in the pilot was to make the link between business growth and the agreed training plan.

- the need to engage employees. The literature suggests that there are many barriers to employees undertaking e-learning, but where e-learning is linked very closely to day-to-day tasks, it is more successful.
- the availability and access to ICT. In sectors where there is low computer penetration, this is a key barrier. Computers in the workplace are also often not linked to the internet, which can create connectivity barriers. For example, a consultation on the NHS e-learning strategy (NHSU, 2004) found that two fifths of respondents saw a limited IT infrastructure and lack of access as the main barriers to the development of e-learning. Our review identified a number of potential responses to these barriers, including:
    - ensuring that learning materials do not use unnecessary graphical content that may create accessibility barriers to learners
    - engaging the workforce so that colleagues are flexible enough to provide access to computers for learners
    - ensuring that learning can be undertaken at home
    - providing laptops for the use of employees in the workplace
    - establishing learning centres in the workplace.
- a lack of ICT skills. E-learning appears to have more penetration in sectors where employees use computers as part of their work, though some project-based evidence suggests that learners can effectively use e-learning with very little ICT knowledge. Research undertaken with larger firms using e-learning (Hill and Kappler, 2004) found that 42 per cent thought that overcoming users' objections to e-learning, was the greatest challenge to its successful implementation.
- the lack of skills and knowledge to implement e-learning. This can include employers' knowledge of the availability of e-learning materials, skills among employers to establish and implement e-learning activity and the skills among learning providers to establish, implement and support e-learning in the workplace. The CIPD survey (2004) found that 69 per cent of e-learning practitioners felt that e-learning demands an entirely new skill set for people involved in training and development.
- the upfront costs of developing e-learning materials can be a barrier to developing the employer-focused, work-based e-learning that employers want, particularly in SMEs. Our review uncovered a number of projects that consider themselves to be self-sustaining, but in at least two cases, this did not take into account the cost of developing the e-learning material.

11. We also identified a number of trends in the successful implementation of e-learning in the workplace. These include:

- the provision of tutor support for e-learning. The evidence suggests that the learning experience is better and completion rates are greater where there is tutor support either face to face, online or over the telephone.
- the increasing integration of e-learning with more traditional forms of learning. The CIPD survey (2004) found that 80 per cent of companies think that e-learning is more successful when combined with more traditional forms of learning.
- changes in technology further enhancing the e-learning experience. However, some project evidence warns against focusing too much on the technological aspects of the learning materials and not enough on the learning itself.

12. Our most striking conclusion from the review was the lack of objective published evidence relating to the effectiveness or impact of work-based e-learning, outside the corporate sector. Given that work-based e-learning is still a relatively young and evolving concept, we believe that greater formal sharing of experience and evidence of the use, effectiveness and impact of work-based e-learning activities is essential.

13. A major consideration for the remaining phases of the project is how we define work-based e-learning in relation to blended learning activity and therefore identify the issues associated with the 'e' aspect of the learning.

14. The implications for future activity in relation to work-based learning will be investigated further in Phases 2 and 3. Below, we present an initial indication of the issues identified in this review and some areas of action for partners to consider.

- *Issue 1*: The changes in the context of public policy have the potential to remove many of the barriers to the development and take-up of publicly funded, work-based e-learning. The challenges for partners are to:
    - ensure that implementation of these policies does remove the barriers and does not create new ones
    - encourage and support work-based learning providers and employers to take advantage of the changing policy context to develop and use more e-learning where it is appropriate.

- *Issue 2*: A key barrier to the take-up of e-learning among SMEs is the lack of engagement with learning, partly because they find it difficult to identify learning needs and relate them to business needs. Some of the evidence suggests that business assessment tools based on e-learning may help overcome these barriers. Partners should consider:
    - developing e-learning models for encouraging business engagement and the identification of business and skill needs
    - encouraging and supporting the development of business assessment and skills assessment tools, including the sharing of good practice.

- *Issue 3*: Access to computers and the internet can be a further barrier to the take-up of e-learning in the workplace. Partners should consider:
    - sharing best practice in terms of supporting access to ICT in the workplace
    - encourage and support ICT provision in the workplace where appropriate.

- *Issue 4*: Many work-based learning providers and employers lack the skills and knowledge to implement and deliver e-learning. Partners should consider how to support the development of:
    - the skills and knowledge of business managers to identify, develop and implement e-learning in their workplaces, particularly within SMEs
    - the skills and knowledge of the staff of work-based learning providers
    - models of sustainable work-based e-learning development, particularly in SMEs
    - context-specific e-learning materials including simulations, particularly among SMEs
    - more formal evaluations of e-learning and the sharing of evidence between providers and employers
    - mechanisms to share best practice and experiences of work-based e-learning activity.

1 Introduction

Context

1.1   In a progressively more competitive global economy where there is continuous technological change and rising customer expectations, 'sustaining a competitive, productive economy which delivers prosperity for all requires an ever-growing proportion of skilled, qualified people' (DfES, 2003b).

1.2   Government, employers and training providers are increasingly recognising that e-learning has a potentially important role to play in developing and maintaining the skills required by the workforce. Many large corporate organisations have been developing and using e-learning applications for a number of years, but the use of e-learning is more embryonic when used to support publicly funded skills provision and skills development in small and medium-sized enterprises (SMEs) and to fill specific skills gaps in the workforce.

1.3   This research, funded by the Learning and Skills Council (LSC), has been commissioned by the British Educational Communications and Technology Agency (Becta) to provide an objective, evidence-based overview of the current use and effectiveness of work-based e-learning and its integration with more traditional learning methods. It is primarily focused on activities related to publicly funded work-based training, SMEs and occupations that typically undertake less than average training activity. Our interest in larger organisations is limited to identifying how the lessons learned from their activity might be translated to these environments.

1.4   By 'e-learning', we mean: 'The delivery and administration of learning opportunities and support via computer, networked and web-based technology to help individual performance and development' (Pollard and Hillage, 2001).

1.5   By 'work-based learning', we mean 'learning that is undertaken in or linked to the workplace'.

Aims and objectives

1.6   The overall aim of the project is to inform the future policy and activities of Becta and its partners. The specific objectives of the research are to:

- investigate the known impact of ICT and e-learning on the skills sector
- establish and describe the ways in which ICT and e-learning can support key workforce development issues, such as addressing skills gaps and achieving sustainability in training and development
- report how ICT and e-learning can and are helping particular industry sectors
- identify gaps in provision
- identify where further work is needed to promote and embed the effective use of ICT and e-learning.

1.7   The research has three phases:

- a review of published and unpublished literature on the use, impact and effectiveness of work-based e-learning
- a survey of providers to develop a detailed baseline of publicly funded e-learning activity
- in-depth primary research to develop the evidence base on work-based e-learning and identify potential areas of action for Becta and its partners.

1.8 This report highlights the findings from Phase 1 of the research, which aims to provide an overview of the current knowledge and activities relating to work-based e-learning through:

- a review of the research literature related to the use of ICT and e-learning in the context of work-based learning in the skills sector and the approaches used in different sectors
- mapping of the structure of work-based learning provision and the relationships between stakeholders.

Methodology

1.9 The research in Phase 1 has three stages:

1. a literature review
2. desk research and interviews with stakeholders and providers
3. in-depth case studies.

Literature review

1.10 The major component of Phase 1 is a literature review of the use of ICT and e-learning in the workplace.

1.11 The review covers over 200 source documents including government strategic and research publications, research by the LSC and other agencies, academic journals, industry-related websites and publications, and specific project reports and evaluations. It seeks to inform Becta and its partners about the work-based e-learning strategic landscape as well as identify specific evidence on the use and impact of work-based e-learning. Our literature review is structured around four themes:

- the strategic and funding context for e-learning and work-based learning
- evidence of current and potential demand for e-learning in the work-based context
- a review of work-based e-learning activities delivered by different types of learning suppliers – for example, higher and further education, LSC-funded work-based learning providers, sector bodies, unions and large corporate employers
- a brief overview of the situation in other parts of the world, including the rest of Europe, North America and Australia.

1.12 The detailed findings of the literature review are available as a separate report.

Desk research

1.13 Our literature review was supplemented by desk research and interviews with 28 stakeholders and learning providers. The interviews were primarily undertaken with organisations identified during the literature review and aimed to identify additional or updated information on the project identified in the review. The organisations contacted are listed in Appendix A. This stage aimed to investigate the existence of relevant unpublished evidence and identify potential case studies for Stage 3.

1.14   We have also worked with researchers undertaking relevant projects alongside this one. These include research commissioned by:

- Becta: mapping e-learning activities being undertaken by local learning and skills councils (LLSCs), regional development agencies (RDAs) and government regional offices
- e-skills UK: mapping the e-learning activity and strategies of sector skills councils (SSCs).

1.15   Where timescales have allowed, we have not duplicated this activity, but integrated their findings in this report.

Case studies

1.16   The final stage of Phase 1 of the project is to present a small number of in-depth case studies that illustrate current work-based e-learning activity as well as highlight good practice and the challenges that need to be addressed.

1.17   We identified our case studies through our literature review and desk research. Our primary criterion was that projects had – or were able to help us identify – evidence of its success and challenges from a number of perspectives. We also sought to identify examples from different types of providers and in different contexts.

1.18   In some cases, the projects that were chosen as case studies had already undertaken a robust review and so were able to provide us with appropriate evidence. For others, we undertook a small number of additional interviews with stakeholders, employers and/or employees to get a wider perspective. Our case studies include:

- The Canary Wharf Construction Workers' Learning Centre, a partnership led by the Union of Construction and Allied Technical Trades and Lewisham College Trade Union Study Centre
- British Gas and their customer care training for gas service engineers
- the Certificate in Online Learning run by the Chartered Institute of Personnel and Development (CIPD)
- e-skills UK's 'e-skills into business'
- e-NVQs, an e-portfolio project to support apprenticeships.

1.19   We have included relevant extracts from case studies throughout the report. Detailed case study reports are presented in Appendix B, separate from this report.

Scope of the review

1.20   We have agreed that the scope of the review would be based on three aspects:

- the definition of work-based learning
- the definition of ICT and e-learning
- geographical coverage.

Work-based learning

1.21   This study is concerned about learning that takes place in, or is linked to, the workplace, primarily in SMEs. This includes activities such as:

- on-the-job learning
- college day release
- apprenticeships
- work placements for young people
- continuous professional development.

ICT and e-learning

1.22   The scope of our study is slightly narrower than that used in the Unified E-learning Strategy Consultation (DfES, 2003a). Our focus is how ICT can be used as a tool for managing and undertaking teaching and learning. Our study does not cover the generic use of ICT, although a great deal of e-learning is associated with learning ICT skills. We have used the Pollard and Hillage (2001) definition of e-learning as the basis for our research: 'The delivery and administration of learning opportunities and support via computer, networked and web-based technology to help individual performance and development.'

1.23   We recognise that the available literature is based on a wide range of different e-learning definitions, but this does not exclude its validity or relevance as long as significant differences are identified.

Geographical coverage

1.24   The majority of our strategic review has focused on the policy and funding framework as it applies to England. Since devolution, each nation has adopted slightly different strategic and funding contexts. Our detailed literature review provides an overview of the key strategies in the other three nations and in the nine English regions.

1.25   We have imposed no geographic boundaries on other aspects of our review, as it is important that lessons are learned from wherever activity is taking place. For this reason, we have also included a separate section in our literature review on the situation elsewhere in Europe, in North America and in Australia.

Structure of the report

1.26   In the remainder of the report, we summarise the findings of Phase 1 of the research in four further sections illustrating:

- the strategic and funding context. By their nature, strategies are forward looking; this, therefore, provides an indication of the future public-sector context in relation to workforce skills development and e-learning.
- work-based e-learning activities. In this section, we consider commentators' views on the uptake of work-based e-learning and provide an overview of the type and range of work-based e-learning activity that is being delivered by different providers in different sectors.
- common themes in the challenges to be faced in ensuring a wider uptake and effective use of work-based e-learning. We also discuss responses to some of these challenges.
- conclusions and implications for the further stages of the research.

2 Strategic and funding context

Introduction

2.1   This section sets out the strategic context for work-based learning and e-learning activity and discusses some of the funding issues. The Government has produced a number of recent strategies that impact on workforce development and e-learning, and as a result, the actions proposed are still being implemented. Our analysis, therefore, seeks to identify the factors that may impact on work-based e-learning in the near future. The key strategic documents are:

- *21st-century Skills: Realising our potential* (Skills Strategy White Paper) (DfES, 2003b)
- *Success for All: Reforming further and higher education and training* (DfES, 2002a)
- The consultation document *Towards a Unified e-Learning Strategy* (DfES, 2003a).
- *Report of the Learning and Skills Council's Distributed and Electronic Learning Group* (DELG, 2002)
- *Get On with IT: The Post-16 e-Learning Strategy Task Force report* (DfES, 2002b)
- *The Final Report of the Working Group on 14-19 Reform* (DfES, 2004).

2.2   It should be noted that, throughout this section, we focus on strategies and funding in an English context, and recognise there are some differences in emphasis and structure across the four parts of the UK.

2.3   This section considers some of the themes emerging from these strategies and how they may impact on work-based e-learning.

Training to meet employer needs

2.4   The DfES Skills Strategy aims to ensure that employers have greater information, choice and control over the publicly funded training that is available and how it is delivered. It is intended that this strategy will encourage a more demand-led publicly funded training system that meets the needs of employers. Examples of action include:

- removing the age cap on funding for apprentices
- evaluating and extending the employer training pilots that provide support, advice and funding for employers to train workers up to NVQ Level 2 equivalent. A new national Employer Training Programme based on these pilots will be launched in 2006 (HM Treasury, 2004).

2.5   The newly completed Skills for Business Network of the sector skills councils (SSCs), considered an important link between employers and learning provision, will ensure that publicly funded provision meets sector needs. Sector skills agreements are being developed that set out the skills and productivity issues that need to be addressed in each sector, plus areas for collaborative action.

2.6   Similarly, at a regional level, adult skills pilots are being trialled. These new partnerships between the Learning and Skills Council (LSC) and regional development agencies (RDAs) aim to increase employer demand for skills and the responsiveness of provision to business needs.

2.7 On the supply side, the Skills Strategy sets out the intention to:

- reform the funding arrangements for adult learning and skills, to encourage training providers to work with employers while reducing bureaucracy
- support colleges to offer a wider range of business support for local employers
- bring private providers who have something distinctive and high quality to offer within the scope of public funding.

2.8 Local learning and skills councils (LLSCs) are responsible for planning post-16 skills and training to ensure they meet both sectoral and local geographical needs. Each LLSC is currently undertaking a strategic area review (StAR) that is intended to be a comprehensive process covering every LSC-funded provider in every local area. The aim is to ensure that the needs of both learners and their communities are met by a mix of provision, responsive infrastructure and more choice of opportunities. All these reviews will be completed by the end of March 2005.

2.9 These activities could potentially raise the demand for work-based learning that will allow employers to use public funds to support more flexible training than is currently available, to meet specific employer and employee needs.

Greater focus and responsiveness for public funding

2.10 The Skills Strategy also sets out a more targeted use of funding. The LSC – responsible for funding post-16 learning – will now fund courses for:

- any adult without a full Level 2 NVQ equivalent qualification (representing the foundation skills for employability)
- 19–30-year-olds without a Level 3 NVQ equivalent qualification of any kind
- adults aged over 30 seeking a Level 3 NVQ equivalent qualification in sectoral or regional skill priority areas.

2.11 Regional Skills Partnerships are being established that will build on the existing Frameworks for Regional Employment and Skills Action (FRESAs) to identify regional skill priorities and to implement the Skills Strategy's proposals at regional level. These are being established by the RDAs with the LLSCs, the Small Business Service (SBS), Jobcentre Plus and the Skills for Business Network, supported by the relevant government office. SSCs will help identify sectoral skills priorities through their sector skills agreements.

2.12 The StARs being undertaken by each LSC will involve decisions on the funding allocations to providers by each LSC office. This year (2004/05) sees the implementation of a new funding system designed to make the relationship between funding, planning and strategic reviews more responsive to skills needs. The LSC will fund colleges on the basis of the provision that they have planned in their three-year development plans. These are agreed with their LSC in the light of national, regional, sectoral and local priorities (LSC, 2004a).

2.13 This new plan-led funding system is expected to include work-based learning from 2005-06. 'Success for All' promises the scrapping of the rules that designate lower funding for courses dedicated to a single employer, as this has artificially suppressed the supply of customised provision for employers.

2.14 The DELG report emphasises that the LSC's formula funding should not treat e-learning any differently from other forms of learning, but non-formula funding should build capacity, target resources where most effective, encourage e-learning development and fill gaps.

2.15 The post-16 E-Learning Policies and Programmes Board (EPPB), a joint LSC/DfES body, has recently been established to produce and implement e-learning strategies specifically in the skills sector. It is an attempt to bring coherence to the funding aspect of e-learning, as well as to the strategic vision, and will consider the funding of all of the services that its members control within a single budgeting process (Thompson, 2004). It is hoped that this will minimise overlap between service provision.

2.16 The funding of e-learning is still being finalised, but the EPPB's vision is that it will become less centrally directed and that 'over time … e-learning would no longer require special programmes or funding arrangements, with decisions about the place and role of e-learning being made by providers' (Thompson, 2004).

2.17 The DfES E-learning Strategy Consultation proposes to ensure the sustainability of e-learning by tackling the funding models that restrict innovation. It is expected that this will partly be achieved by establishing partnerships with local industry and SMEs – for example, through the Centres of Vocational Excellence (CoVEs) and Union Learning Fund projects.

Integration of e-learning into planning

2.18 The DfES is seeking to embed e-learning objectives across all of its skills and education strategies. It intends to make ICT and e-learning an integral part of delivering the skills and education needs of the country. For example, the Skills Strategy proposes that e-learning should have an important role in increasing the supply of post-16 skills because new technology 'can transform the way colleges and training providers deliver their services'. It makes a clear commitment to developing e-learning across the education/business spectrum.

2.19 In addition to the strategic coherence expected from the establishment of the post-16 E-Learning Policies and Programmes Board, each LSC has been asked specifically to address the role of e-learning as part of its strategic area review. The LSC StAR support notes (LSC, 2003c) do not require each LSC to produce a separate e-learning strategy, but suggest that each LSC:

- requires all work-based learning providers to assess the roles that e-learning can play in the delivery of their targets or the fulfilment of their objectives, and evaluate the benefits and risks of using e-learning
- identifies opportunities for wider exploitation of learndirect and National Learning Network materials in workforce development
- addresses the issues of continuity in e-learning transition from further education to work-based learning
- ensures that the implications of e-portfolios for workplace assessment are known and appreciated by work-based learning providers and incorporated into workforce development programmes and providers' e-learning strategies.

2.20 A number of RDAs have also taken this approach in relation to their FRESAs, by considering how e-learning can be used as a tool to address specific actions rather than developing a specific e-learning strategy.

Qualifications framework

2.21 The Skills Strategy sets out the intention to reform the qualifications framework, by increasing the level of unitisation in learning courses and by introducing a credits framework for adults. The aim of these changes is to provide greater flexibility for both learners and employers in packaging the learning programmes that best suit their needs.

2.22   The Qualifications and Curriculum Authority (QCA, 2004a) has developed a framework for consultation that aims to produce a simpler, more responsive, inclusive and diverse qualifications framework, one that is also less bureaucratic. It aims to:

- involve employers in the development of units within the framework
- offer individual units that relate to employer-based training programmes
- enable employees to receive credits towards a qualification for learning undertaken at work
- brand qualifications with a particular link to occupational standards.

2.23   In addition, the Working Group on 14–19 Reform (2004) proposes significant changes to the curriculum for 14- to 19-year-olds that will seek to address the historical lack of parity between vocational and academic learning. It proposes the creation of a coherent diploma framework with a stronger vocational provision developed with greater involvement of employers, higher education institutions and the business community. It recommends that the vocational aspects of the diploma should include:

- coherent delivery of the knowledge and skills needed by different employment sectors
- relevant, structured work placements.

E-assessment

2.24   The QCA (2004b) has developed a blueprint for the delivery of e-assessment. Over the next five years, it proposes that:

- all new qualifications should include assessment on-screen
- awarding bodies should be set up to accept and assess e-portfolios
- most examinations should be available optionally on-screen, where appropriate
- national curriculum tests should be available on-screen for those schools that want to use them
- the first on-demand GCSE examinations should start to be introduced
- 10 new qualifications should be specifically designed for electronic delivery and assessment.

2.25   In a presentation at a QCA conference, Martin Ripley (2004) described three ways in which technology can have an impact on assessment. It can:

- replicate paper tests, but allow learners to take them at a time and place they choose. This is currently the most prevalent form of e-assessment.
- allow limited modification to test design and content – for example, through the use of video clips or dragging-and-dropping technology
- allow for the radical redesign of testing and content – for example, using scenario- and games-based environments. This is currently the least prevalent form of assessment.

2.26   E-assessment does not only cover tests, but also other forms of assessment such as e-portfolios, which is of particular relevance to NVQs.

Co-ordination of post-16 e-learning

2.27   The National Learning Network (NLN) programme aims to embed e-learning into post-16 provision. Since its inception, the NLN has supported further education (FE) colleges, adult and community learning and specialist and sixth-form colleges, and is now starting to focus on work-based learning. As a result, it has established a work-based e-learning working group, consisting of a wide range of national partners,

to inform the development of an implementation strategy to embed e-learning into work-based learning and workforce development provision. The group is currently developing an action plan based around the themes of:

- communication
- primary and secondary research
- awareness raising
- capacity building
- evaluation.

2.28 Both the University for Industry (Ufi) and the Skills for Business Network are key partners in implementing both the skills and e-learning strategies. The Sector Skills Development Agency (SSDA) has agreed a protocol with Ufi (Ufi/SSDA, 2004) that agrees a close working relationship and outlines the ways in which they will work together to promote e-learning as part of the skills solution for each sector. The protocol states that:

- learndirect will be promoted as an effective business solution for the UK workforce
- Ufi will work closely with each SSC during its initial market assessment to help it assess and address the demand for e-learning within each sector
- good practice in learndirect engagement will be promulgated throughout the Skills for Business Network
- e-learning through learndirect will be a key way to help meet the skills needs identified by SSCs.

2.29 e-skills UK is taking the lead in relation to e-learning for the Skills for Business Network.

Conclusion

2.30 This section provides an overview of the strategic framework for skills development and e-learning. It suggests that the potential for e-learning to make a positive contribution to work-based learning has been recognised and that a number of changes in public policy will allow e-learning to prove its value. These include:

- the better co-ordination of post-16 e-learning policy and implementation and its integration into existing activity – for example, through the extension of the NLN programme and its integration into the LLSC StARs. This will help to ensure that the value of e-learning in the workplace is understood and that any e-learning developed is sustainable.
- a greater focus on demand-led, publicly funded, work-based learning provision. This new focus is likely not only to lead to an increase in the demand for work-based learning, but also an increase in demand for short-term, focused, flexibly delivered learning provision. It is this type of learning that many commentators believe can be delivered effectively through e-learning.
- the introduction of a credit-based qualifications framework. This will make it more likely that short-term, employer-focused, flexible learning will be recognised as part of a qualification and, as such, will make it easier for the public sector to prioritise and fund it.
- the introduction of e-assessment. This could reduce some of the barriers to learning by allowing assessment to be undertaken at a time and place to suit the learner. It can also provide more immediate feedback and provide alternative assessment opportunities.

3 Work-based e-learning activity

Introduction

3.1   In this section, we discuss the evidence relating to the uptake of work-based e-learning and its future growth. We also provide an overview of the type and range of work-based e-learning activity that is being delivered by different providers in different sectors. It is not our intention to provide a comprehensive picture, but to provide a flavour of the activities being undertaken.

Uptake of work-based e-learning

3.2   Our literature review identified that evidence of demand for e-learning is fragmented and patchy, particularly that emerging from SMEs themselves and it is therefore not clear to what extent e-learning is being used in the workplace.

3.3   A Department for Education and Employment study (George and Cooper, 2001) undertaken in 2000 surveyed a representative sample of 1,600 employers. It found that one fifth of these had used information learning technology (ILT) in the previous 12 months. However, these companies tended to be larger than the majority, based in the service sector and make greater use of computers in the workplace generally. It also reported that managers were more likely to receive ILT-based training than people in other occupations, but this was partly a reflection of the fact that they received more training generally.

3.4   Recent evidence is less objective. Much of the available literature comes from e-learning providers and developers who tend to report progress (almost invariably in large companies) to practitioner audiences via an online 'trade press'. Most of the surveys from these sources suggest that a large proportion of companies use e-learning for at least some of their staff. However, these surveys should be treated with caution as:

- they are nearly always surveys of large companies
- many have small sample sizes
- the samples are often statistically biased either because of the methodology (for example, online surveys will bias toward organisations with internet access) or the sample selection (for example, a sample drawn from an e-learning provider's database will be biased towards organisations that have shown some interest in e-learning).

3.5   The e-learning vendors are well placed to comment on the small business market. However, with their vested interest in promoting demand for e-learning, they are not completely unbiased sources.

3.6   Our literature review found that there is currently little balanced evidence in the academic literature to suggest a widespread independent move among UK businesses to adopt e-learning. Analysis of the summer 2004 Labour Force Survey (Office for National Statistics) shows that 12 per cent of employees who had received training in the previous four weeks had received some of it via e-learning. This suggests that the use of e-learning may not be as prevalent as most studies imply and that the growth in e-learning has not been as great as earlier literature has suggested. Lower-than-expected growth may be due to the reporting of previously unrealistic expectations during the 'dot-com' boom.

3.7   The literature does provide some indication of the nature of e-learning use:

- There is a reasonable degree of consistency across the literature that e-learning is used more widely in sectors of industry with a high computer penetration.
- There is some consistency of view that manual workers are the least likely to receive e-learning.
- There is some indication that 'hard skills' such as IT are more likely to be delivered via e-learning than 'softer' interpersonal ones.

3.8   It is also interesting to note trends highlighted by the industry, bearing in mind the reservations we identified earlier.

3.9   In a recent survey of practitioners in the public and private sectors (Clark and Hooley, 2003), the Epic Group e-learning company compiled a list of trends in e-learning that were anticipated across a wide spread of industries and sectors. The survey forecast that the greatest growth of e-learning should be expected in further education (FE), for which sector the National Learning Network has already made a significant contribution in opening up access. Further education providers were closely followed by large corporations and then public sector employers, with e-learning already piloted in such government departments as the Cabinet Office, Department for Work and Pensions, Inland Revenue and the Environment Agency. The survey concluded that lifelong learning currently remains the least buoyant market for e-learning in the UK.

3.10   SkillSoft, another e-learning provider, recently conducted a practitioner survey of 150 human resource and training professionals in large companies, regarding their views of e-learning (Anon., 2004b). Nearly all of the staff (96 per cent) from well-known organisations surveyed – including Xerox, Reuters, Sainsburys, Shell, O2, Deloitte, Nestle Purina and Marconi – agreed that the use of e-learning in overall training delivery would increase during the next two to three years. Of those who expected to increase their e-learning provision, 58 per cent said that more than quarter of their training would be delivered by e-learning, and a large majority expected that a sizeable proportion of their IT training would be online.

3.11   The extent of e-learning penetration in the workplace and its speed of growth may still not be totally known, but there can be no doubt that e-learning is being used and that this will increase.

Examples of e-learning delivery

3.12   Although we found little literature outside the corporate sector summarising the use of work-based e-learning and its impact, we did identify a great deal of reporting of individual work-based e-learning projects. This suggests that there are a large number of different learning providers delivering different types of work-based e-learning in diverse settings. Examples include:

- the acquisition of higher-level skills, such as the Biopharm project run until 2002 by the University of Greenwich for pharmaceutical and biotechnology companies based in Kent Thames-side. This included six online delivery courses, covering registry and regulatory affairs, skills in biotechnology, the drug development process, bio-informatics and pharmaceutical analysis.
- business analysis and needs assessment, such as e-skills into business (ESiB), an online business improvement program for SMEs. The program is designed to help businesses become more competitive and improve their 'bottom line' performances through the development and effective use of IT, e-business and management skills in-house. It includes online business analysis and skills analysis toolkits as well as over 200 online courses.
- the delivery of soft skills, such as the National Nursing Leadership Programme.

This provides e-learning courses in leadership, management and personal development. Each section is made up of 16 units, each of which represents three to four hours of training time.

- the learning of basic skills in the workplace, such as the Surrey Flagship Project. This helps facilitate a tailor-made learning programme for employees making use of e-learning packages offered by learndirect and the nine further education colleges in Surrey.
- the use of e-portfolios to support NVQ evidence collection. For example, Somerset County Council has introduced e-portfolios on an NVQ programme that it runs, to try to reduce drop-out rates and bureaucracy.
- the assessment of key skills on-screen. By April 2004, 43,000 basic and key skills tests had been assessed on-screen.
- the use of simulations in training. For example, Jobcentre Plus has used a simulation-driven program in which learners practise questioning skills interactively with eight realistic 'virtual' customers. The aim is to improve the interviewing skills of junior-grade frontline staff dealing with customers claiming to have lost or not received social security payments.

3.13   It is important to note that we cannot tell from the literature how many of these activities are still being undertaken or to what extent they are small pilots. There is also little evidence on the effectiveness of many of these projects. The literature tends to be limited to reports that the projects are taking place or being developed: it does not often review success or, just as importantly, describe any lessons learned. We discuss some of these issues further in Chapter 4.

Activities by types of provider

3.14   The previous examples show that a diverse range of providers is delivering work-based e-learning. We discuss below some of the typical types of work-based e-learning being delivered by various provider types.

University for Industry (Ufi)

3.15   Ufi is a major provider of work-based e-learning. Part of its original rationale was to increase the number of companies (particularly SMEs) providing learning opportunities to employees. Ufi's draft 2005–2010 strategic plan (Ufi, 2004a) reports that it has engaged with over 100,000 SMEs and delivered 250,000 courses. However, a strategic evaluation of Ufi (Tamkin *et al*, 2003) found that learndirect has tended to focus on:

- the individual rather than the needs of the business
- foundation-level provision.

According to the evaluation, demand for learndirect in the workplace is strongest for ICT training.

3.16   The new draft strategic plan is seeking to address this and proposes to quadruple its engagement with SMEs over the next five years. It proposes to provide three services:

- courses for essential skills for work, delivered to people without Level 2 NVQ equivalent qualifications or with 'skills for life' (i.e. basic skills) needs
- business training for small and medium-sized businesses, predominantly online
- impartial advice on all learning and career opportunities nationally.

3.17   As part of its provision for SMEs, Ufi plans to develop through a distributor's network a

full range of employee development services for those working in SMEs. It intends to provide material that meets the most urgent training needs of employers, either repackaging existing content or creating new material. This will be sold at the market rate either on the web or through resellers. Only employers with fewer than 250 employees will be targeted by Ufi.

Higher education

3.18 The Higher Education Funding Council for England (HEFCE) produced a draft e-learning strategy for consultation in July 2003. Responses were published in May 2004, although a revised strategy has yet to be produced. Although the draft strategy is mainly concerned with university-based learning, it does propose several objectives in relation to workplace e-learning. These, however, are mostly preparatory in nature:

- to research the needs of employers and the effectiveness of e-learning
- to develop a concordat between the HE Academy, Universities UK/Standing College of Principals (UUK/SCOP) and SSCs to 'assist in articulating employer perspectives on e-learning needs in the curriculum'.

3.19 This contrasts with the more action-based proposals outlined for the rest of the higher education (HE) sector. This disparity has been picked up in the consultation process, with suggestions that more action is taken for work-based e-learning under Strand 3 of the strategy: Curriculum Design, Development and Pedagogy, and Human Resources.

3.20 Many universities have developed virtual campuses – websites hosting various learning resources, ranging from electronic versions of course notes to fully online courses. Our literature review identified a number of areas where individual HE institutions were delivering work-based e-learning. In addition to the University of Greenwich example mentioned earlier, we identified:

- online MBAs, such as:
  - Oxford Brookes University MBA, which comprises e-learning seminars and tutorials, a virtual library giving access to journals and full-text articles, and a mailbox with a confidential link to tutors
  - Herriot Watt University's MBA, which offers the choice of studying entirely on campus, entirely online or a combination of the two
  - two projects at the University of Luton, funded by the European Social Fund (ESF): 'Enterprise development for SME managers', which ran from 2002 to 2004; and a current project, the 'MBA for owners and managers in developing businesses'.
- the use of technology to support student work placements. In a survey of higher education institutions (HEIs), students and placement providers to determine the current approaches to the delivery of work-based learning programmes (Vickerman et al, 2003), it was found that HEIs prepared students for work-based learning in a wide variety of ways. Paper-based handbooks were the most favoured method used to disseminate information to students and placement providers, but there was some use of CD-ROMs and the web. In fact, the project's final output was a CD-ROM that acted as an interactive learning aid to evidence knowledge and skill developments prior, during, and following work-based learning experiences.
- support for continuous professional development. For example, the UK Healthcare Education Partnership seeks to provide inter-professional and highly patient-centred online learning modules for post-registration healthcare professionals. Students have access to a Virtual Learning Environment (VLE) and can log on and study wherever they have access to the internet. Each learner is assigned to an e-tutor and tutorial group, and the learning approach includes digital learning games, virtual presentations and access to online journals. The modules offered are all at Level 3 NVQ equivalent and include 'Clinical governance matters', 'Health informatics' and 'Research methodologies for practice'.

Further education

3.21 A survey of further education (FE) colleges on behalf of the Learning and Skills Council (2004c) found that learndirect accounts for the majority of colleges' remote learning, with two thirds delivering learndirect courses. However, just over half of colleges conduct some remote learning that is not delivered via learndirect. Remote learning is widespread in only 10 per cent of colleges. The survey does not identify how much of this learning is work-based. In 1999, the Association of Colleges estimated that the average college works with 250–300 local SMEs (AoC, 1999).

3.22 Engagement with SMEs is likely to be greater in Centres of Vocational Excellence (CoVEs). One of the aims of the CoVE approach is to make FE provision more responsive to the needs of employers, and a recent survey suggests that 30 per cent of employers engaging with CoVEs employ 10 or fewer members of staff (GHK, 2004). Employer satisfaction with CoVE provision is also high, with 82 per cent of those surveyed rating the training as excellent or good.

3.23 Case studies of some existing CoVEs show that the use of e-learning to meet these goals has already begun (LSC, 2004a). At both Barnfield College and Truro College – CoVEs for the care sector and motor vehicle engineering, respectively – they see the development of e-learning as a key next step, with Barnfield intending to target SMEs in particular. Truro recognises the importance of CoVE funding. It has allowed some staff development work to go ahead, the effect of which has been the ability to deliver distance learning.

3.24 Hull College has a construction CoVE and has started using online delivery to meet the industry's demand for flexibility in provision. This is also the main reason why ITS Felixstowe, a trade and logistics CoVE, uses e-learning extensively. Learning content is provided on CD-ROMs, and the Electronic NVQ Remote Online Learning (ENROL) system has been developed to deliver courses over the internet. There are plans to roll out the system in several other sectors. It is clear that CoVE funding has allowed the necessary investment in IT for these e-learning developments.

LSC-funded work-based learning (WBL) providers

3.25 Work-based learning (WBL) providers primarily cover apprenticeship, entry to employment and other work-based NVQ-related training. As part of their strategic area reviews (StARs), a small number of LLSCs have undertaken evaluations of e-learning activity among WBL providers. A review undertaken for South Yorkshire LSC (Shaw Associates, 2003) of 36 WBL providers found that 25 per cent used e-learning in some form, while 28 per cent intended to start using it within a year. However, 42 per cent had no plans to make use of e-learning, and one provider sub-contracts all e-learning to the local college.

3.26 Of the WBL providers surveyed, half of the e-learning that was taking place involved using the internet for researching life skills and key skills. Only five organisations were using it for structured training, although employing it to deliver key skills assessment was common.

3.27   A study for the Milton Keynes, Oxfordshire and Buckinghamshire (MKOB) LSC (Mackinnon Partnership, 2004a) found that the use of e-learning in WBL providers is largely dependent on size and sector. Local branches of national providers are more likely to have taken the decision to invest in establishing e-learning, while some providers specialising in specific occupational areas, such as hairdressing, have made a specific decision *not* to investigate e-learning. Some of the smaller providers felt that they did not have the resources to pilot e-learning and were waiting for a lead from the Learning and Skills Council. The study found that some WBL providers were:

- experimenting with e-NVQs, a system whereby learners are able to keep an electronic portfolio of work. This also allows learners (and their managers) to get a clear sense of their progress as the system shows clearly how much they have completed.
- using email to keep in touch with learners
- using CD-ROMs to transfer paper-based materials on to CD for despatch in order to reduce costs.

Adult and community learning

3.28   The National Learning Network's adult and community learning (ACL) information learning technology strategy (National Learning Network, 2003) covers all aspects of ACL. It makes clear that, although workplace learning was traditionally separated from ACL, there is a need to use workplaces where appropriate to deliver learning.

3.29   The MKOB LSC e-learning review (*see* 3.27) identified that adult learning providers are largely committed to developing e-learning through libraries and UK Online centres. However, Buckinghamshire Adult Education has tried a different approach with its Strengthening Business Links programmes, which have since spread to Milton Keynes and Oxfordshire. Funded by the LSC and ESF, they involve the delivery of training courses in the workplace. Buckinghamshire is targeting SMEs, while Milton Keynes and Oxfordshire are concerned with voluntary and community organisations. Courses on offer include basic IT skills, newsletter writing, website design, internet and email use, financial management, volunteer management and desk-top publishing.

Trade unions

3.30   The Trades Unions Congress (TUC) has entered into a practical partnership with Ufi and established the Trade Union Hub, setting up a network of 70 new Trade Union Study Centres in colleges, union offices and workplaces. These centres offer hundreds of mostly online courses, providing both short tasters and longer programmes. They mainly offer IT and other essential skills for work, including report writing and communication.

3.31   There has been a sharp increase in the number of union members signing up for courses in Hub centres, rising from 324 in 2001/02 to over 6,000 in 2003/04, and most of them have done more than one course. What marks out learning centres supported by the Trade Union Hub (as opposed to other hubs) is the unique role played by union learning representatives. Since they have the trust of their members, they are best able to promote the centres to them, help identify their learning needs and enrol them on to courses (TUC, 2004b).

3.32   One example is the Graphical, Paper and Media Union's CMS Learning Centre in Manchester, which opened in 2002. The most popular courses are in IT, but there is a clear demand for Skills for Life courses as well. The centre has developed strong links with the large printing company SunChemical. It gives CMS members (all white-collar staff) four hours in work time for this training, which they have to match with four hours from their own time. The centre is currently discussing with management and union learning representatives how to extend the scheme to include blue-collar workers.

National Health Service (NHS)

3.33   The NHS has recently announced the creation of the NHS Institute for Learning, Skills and Innovation. This will integrate the NHS University (NHSU) with the NHS Modernisation Agency and the Leadership Centre, and will take forward the activities of the NHSU to provide training to employees at all levels within the health service. The NHSU is currently establishing an online 'virtual campus' to complement and enhance traditional learning methods. Access to the campus will be through any computer linked to the internet – at work, in a library, at college or at home. In future, it is hoped that learners will also be able to access the campus via mobile devices such as personal digital assistants (PDAs) or mobile phones, and through interactive digital TV.

3.34   For learners, the campus is designed to offer high-quality learning programmes and services alongside short 'bite size' learning modules that do not require formal enrolment. There will also be information and guidance about learning opportunities: online and telephone support services, including e-tutoring and e-mentoring; learning centres; and learning kiosks. Users will also be able to access research and development through links with electronic libraries and other information resources, skills assessment tools and access to curriculum pathways.

3.35   The NHS has already set up a database listing all the e-learning activity currently being undertaken across the service. It allows users to search for existing courses, giving details of each one, such as geographical coverage, the training provider responsible and the main aims. There are currently nearly 200 individual entries. Examples include:

- Clinical Coding E-learning Module – to train coders in the four-step clinical coding process. Can be distributed on or offline, and involves about 1.5 hours of learning time.
- NVQ Level 2 Social Care Induction Programme – a blended course combining electronic delivery and assessment with tutor/facilitated activity, all managed via an intranet.
- European Computer Driving Licence (ECDL), which aims to deliver basic IT skills to enable the increased use of specific systems as well as improved communication. It is particularly focused on supporting clinical staff in areas where new system rollouts will be taking place – e.g. the National Care Record Service.

Prisons

3.36   The learndirect prisons pilot acknowledged the value of the prison education regime in delivering key skills to prepare prisoners for work. Linking education with employability not only improves learning outcomes inside the prison environment, but also stimulates prisoners' interest in external education and job opportunities once released.

3.37   The pilot ran in five prisons from March to December 2002, and is now being rolled out to other prisons around the country. The use of flexible technologies to encourage self-paced learning is significant in reaching a wider target audience of prisoners, particularly younger offenders with recent negative experiences of formal education. The review confirmed how well learndirect attracts prisoners whose previous education has been bypassed, and who would not normally choose to pursue education within the prison regime.

Sector skills councils

3.38   The Skills for Business Network of SSCs is focused on sector-based workforce development. Many SSCs are beginning to use e-learning to meet these goals. E-skills UK – the SSC for IT, telecoms and contact centres – is taking the lead on e-learning for the network and has recently commissioned a mapping of SSCs' e-learning activity and strategies. This is yet to be published, but our research identified a number of well-regarded e-learning activities being undertaken.

3.39   Many SSCs have set up learndirect learning hubs. For example, the Science, Engineering and Manufacturing Technologies Alliance (SEMTA) has set up a sector learning hub that helps to deliver training in a flexible way to employees in the engineering sector. The courses can be accessed through:

- Open learning centres, which are attached to engineering training centres
- remotely via the hub virtual learning centre
- a company's own learning resource centre.

3.40   Other examples include:
- e-skills UK's 'e-skills into business' (ESiB), an online business improvement program for SMEs (*see* p 26). This is designed to help businesses become more competitive and improve their 'bottom line' performance through the development and effective use of IT, e-business and management skills in-house. It includes:
  – the Business Analysis Toolkit, a company business diagnostic that gives a business owner/manager a comprehensive business analysis report
  – the Skills Assessment Toolkit, skills assessment for employees that identifies any gaps between their current skills and those required to do their job
  – online learning: an e-learning library of over 200 courses.
- Learnplastics.com from Polymer Training (now part of Cogent), which aims to provide underpinning knowledge to learners working in injection moulding, and which now leads to a vocationally related qualification.

The corporate sector

3.41   The evidence that derives from large corporate implementation of e-learning clusters around three key drivers of change reported by companies: the rapid growth in information that knowledge workers need to handle, the rapid rate of change in knowledge and skills, and the promise of savings in training costs (Levis, 2002b). Early adopters include the IT and telecommunications sector, banking and financial services and the consulting industry: the services sector is more likely to adopt e-learning than manufacturers. The early adopting industries include those with:

- a large dispersed field workforce
- rapid rates of new product launches and frequent updates
- substantial automation in customer service operations
- systematic management of knowledge and intellectual capital.

3.42   Looking across industry sectors, Levis (2002b) confirms a mixed pattern of adoption of e-learning, and concludes that the market drivers for adoption of e-learning vary significantly in intensity between different market segments. He identifies two distinct forms of adoption:

- a radical, systematic approach, favoured by a few early adopters. These link to systematic, strategic shifts in corporate thinking about learning and knowledge, where:
    − information technology is mission-critical, and is used as a strategic weapon
    − knowledge sharing is critical to competitive success
    − large numbers of people need frequent briefings on new products and processes.
- a more tactical approach typical of the vast majority. These tend introduce e-learning to solve specific problems related to operations or the delivery of training.

3.43   Our research has identified examples where large corporates implemented e-learning:

- British Airways (BA) has a corporate training department responsible for all training except that concerning the flight crew and engineering. They need large volumes of tracked training and wanted to reduce costs by 30 per cent. BA now has a range of e-learning materials including 400 courses on its intranet, 30 Quest Open Learning Centres with full multimedia connectivity, and learner support and access to the current range of 23 bespoke courses (including ones on dangerous goods and fire training). BA also makes use of its website, which hosts a learning directory and learning resources. By January 2002, BA estimated that 400 courses had been accessed 1,354 times, representing 710 delivery days (Socitm Insight, 2002).

- In November 2001, 70 per cent of British Telecom's courses were instructor led and 30 per cent were online. BT sought to reverse this take-up by holding e-learning 'road shows' to increase awareness of what was available and what it could do for individual employees. Staff also received CD-ROMs that contained either relevant courses or an overview of the courses available online. In less than a year, BT doubled the use of online courses, and training costs have declined. Course completions have risen from just over 3,000 to over 6,000 (Bersin and Associates, 2004).

Conclusion

3.44   There is little objective evidence that shows the uptake of e-learning in the workplace or the extent to which the market has grown. The general view from the literature is that the e-learning market has not grown as significantly as expected. Nevertheless, our review shows that there is a great deal of e-learning taking place and that it is delivering many different types of work-based e-learning in many contexts. It is also generally considered that the use of work-based e-learning will continue to increase.

3.45   The lack of any overall review of activity means that it is difficult to identify to what extent the work-based e-learning activities we have identified are ongoing or simply small pilots. Our research has identified many work-based e-learning projects in different contexts, but there is a lack of evidence of the volume of these. Much of the e-learning being undertaken is related to IT and hard technical skills.

3.46   There is also less evidence of the effectiveness of many of these projects. Literature tends to be limited to reporting that the projects are taking place or are being developed. It does not often report their relative success or failure.

3.47   Much of the literature reports what is planned, which suggests that work-based e-learning activity is continuing to be implemented. However, it is less clear to what extent this is building on past lessons.

4 Common themes

Introduction

4.1 In this chapter, we discuss some of the common themes that we identified in relation to the challenges to be faced in ensuring a wider uptake and effective use of work-based e-learning. We also discuss how some of these challenges may be addressed, either through the continuation of current trends in e-learning or by identifying examples of individual project's responses to similar challenges.

Employer engagement

4.2 The most significant barrier identified by our research is the engagement of employers in e-learning, particularly SMEs. Between August 2003 and July 2004, the Small Firms Enterprise Development Initiative ran a series of workshops to gather the views of small businesses on e-learning (SFEDI, 2004). Respondents cited three main problems they have with e-learning:

- a lack of awareness about what provision is available to small businesses
- the financial and opportunity costs linked to training activities, including time spent away from work
- continuing limited access to broadband for many small firms.

Drivers of e-learning take-up

4.3 As we discussed earlier, most literature is from e-learning providers and developers, who tend to assume that, all other issues being equal, SMEs will be prepared to adopt technology-based learning. Most of these commentators state that change will be the primary driver of e-learning in organisations, at both strategic and tactical levels (Clark and Hooley, 2003), and that e-learning will be seen as a business strategy used for increasing sales effectiveness, improving organisational competency and building richer customer relationships (Finn, 2004).

4.4 Some direct evidence supports this view. In recent research for Ufi (Hill and Kappler, 2004), the self-assessed perceptions of 503 large companies of the impact of e-learning on their organisations were analysed. All respondents were actively using e-learning or planning to do so in the future. Participants considered that top among the key drivers for e-learning was the desire to exploit new technology available within the company, followed by organisational change and new IT systems, processes, regulations and products.

4.5 Learndirect in Northern Ireland has piloted the Small Firms Growth Plan initiative with 502 micro-businesses. Involving over 644 owner/managers and their employees, this ran for more than six months up to August 2003. The model provided funding of up to £300 per employee for e-learning business courses, to be accessed from the workplace or home, running over networks and on CD-ROMs. The offer included use by employers of the learndirect Business Snapshot, an interactive diagnostic tool provided by learndirect's Premier Business Centres. In an evaluation (Lestas Consulting, 2004), owner/managers reported that their main motivation for involvement with the pilot project was to develop their business through employee training, and to be able to make a direct connection between business growth and the agreed training plan.

4.6   The evaluation concluded that the Small Firms Growth Plan model was uniquely tailored to the needs of micro-businesses that had no other appropriate type of support available to:

- examine the needs of the business in relation to its overall growth
- address individual employee skills development
- offer an approach that was flexible and provided value for money, thus making it attractive to owner/managers.

A business development solution

4.7   The University for Industry and the Association of Colleges conducted a study into factors affecting the uptake of e-learning by small businesses (AoC/Ufi, 2001). The following factors were seen as key challenges for local learning providers in engaging the SME market:

- understanding, analysing and meeting SME needs
- interesting and engaging SMEs and their employees
- making the most of management information
- developing and maintaining an effective relationship with SMEs
- developing provider staff to meet the challenge of the SME market
- identifying SME training needs and sourcing appropriate provision
- responding to time constraints within SMEs
- positioning learning as a business solution
- avoiding 'qualification led' provision
- developing a suitable curriculum for SMEs
- making learning a practical possibility
- demonstrating the return on investment.

4.8   The learndirect Northern Ireland pilot appears to have addressed many of these issues, and its experience provides a potential solution to the engagement of SMEs in e-learning. Owner/managers consulted as part of the evaluation thought that the business diagnostic tool – by ensuring a standard approach to assessing training needs and developing the subsequent training plan – was fundamental to the development of the relationship between themselves and the business advisers. Over 40 per cent of the owner/managers surveyed stated that the main reason that they had offered training to their employees was due to an identification of training needs through the tool.

e-skills into business (ESiB)

Targeted at SMEs (1–250 employees), ESiB aims to improve businesses' competitiveness and 'bottom line' performance by engaging them in e-learning and helping them to see the benefits of using ICT. The learning involves three online tools:

• **BAT** (Business Analysis Toolkit). This diagnostic tool enables firms to work out where they stand in relation to ICT and business development, and where they want to be. It includes an individualised company action plan detailing how to engage in ICT to benefit their business.
• **SAT** (Skills Assessment Toolkit). This helps firms to identify their existing skills and to identify the skills they need. It also provides a recommended e-learning training programme to deliver these needs.
• **LMS** (Learning Management System). This is a bank of over 200 online courses – in IT, e-business and management – from which companies can choose those that meet the needs identified in the SAT.

By September 2002, ESiB had reached 2,000 users, and they aimed to have reached 20,000 SMEs for the BAT and 10,000 individual users for the e-learning by the end of 2004. During the pilot study in 2001, 48 per cent of its customers were SMEs that had not previously undertaken any form of IT training.

A 2002 evaluation of the impact that ESiB had had on businesses (Turner, 2002) found:

• 78% of businesses thought that the ESiB process would add value to the way they worked
• 65% of the SAT users said that their organisation would adopt the training outcomes identified
• 58% of the BAT users said that the toolkit had had no impact on their business to date (with only 19% saying it had already had had an impact). However, many businesses said that the impact of the ESiB process would take another year to be fully experienced.

ESIB found that support was needed for the practical implementation of the process after the BAT and SAT. This is especially true where the culture of the business is a barrier to implementing e-learning and ICT solutions. Such firms need support in restructuring their businesses to make it work. Business Link plays an important role here.

Engaging employees

4.9   One case study reflected common problems associated with learning in SMEs, particularly with regard to time and workload pressures (Brink *et al*, 2002). This involved 50 employees in a medium-sized engineering firm in Scotland, who were offered a work-based online module of a certificate in SME management. Their experience demonstrated the importance, when designing learning courses of any kind for employees, of ensuring that their relevancy is seen by staff so that the latter are then able to perform their jobs more effectively. Organisational culture and working environment can also shape the motivation and interests of employees.

4.10   PricewaterhouseCoopers Consulting has used a business-to-extended-enterprise portal to develop external programmes for suppliers and business partners, and to create an e-learning advisory service for clients. It has found that the most successful learning programmes are those that are tied directly to an individual's work. If the learning tool is well designed and the content is critical to helping someone prepare for an assignment or to do a specific task, the learning exercise is usually considered successful regardless of the format.

4.11   In response to this, many larger companies are seeking to ensure that work-based e-learning is customised to the workplace. A Chartered Institute of Personnel and Development (CIPD) survey (2004) found that 57 per cent of respondents were developing customised modules tailor-made for their organisations' business needs, rather than relying on generic, off-the-shelf, packages.

Canary Wharf Construction Workers' Learning Centre

The Construction Industry Training Board established an e-learning network (CILN) that sought to deliver generic learndirect courses to the construction industry and develop its own e-learning. The industry showed a general lack of interest in the latter, but it did have a major focus on health and safety.

The Canary Wharf Construction Workers' Learning Centre in London provides learning targeted at construction workers in the Canary Wharf area and beyond. The aim was to widen participation to a group of workers traditionally excluded from learning, especially about health and safety in the industry. There was no structured training for even the most basic aspects of health and safety, despite a legal requirement – most employers took workers through a 15-minute verbal introduction on their first day. Now the centre can take over 250 learners through an entire course in a week.

The learners we spoke to gave examples of how their health and safety knowledge had changed their practice in the workplace. One learner helped a team of scaffolders to persuade their manager that a 'method statement' – a key piece of health and safety documentation – needed to be produced before the team could resume work, and then helped the team to write one, something he would not have had the confidence or knowledge to have done before.

Access to IT infrastructure

4.12   The Clark and Hooley survey of trends in e-learning found that internet connectivity is a primary requirement for new learning media. However, the CIPD points out that the proportion of staff that regularly uses a computer at work is a critical factor in the design of any e-learning initiative. The sophistication of these computers and any restrictions on their use must also be taken into consideration. There is evidence from a number of sources that access to ICT is still a barrier to work-based e-learning take-up. For example:

- A survey of adult and community learning and work-based learning providers (Lockitt, 2004) identified four main barriers to e-learning in these sectors, including the access to physical resources such as computer- and ICT-based resources and connectivity.
- A consultation on the NHS e-learning strategy briefing paper held in 2004 received 88 responses from a variety of stakeholders including strategic health authorities, NHSU staff from regional offices, NHS trusts, the education sector and commercial education providers. Two fifths of those who responded to this consultation saw the limited IT infrastructure and lack of access as the main barriers to e-learning developments.
- A South Yorkshire LSC survey (Shaw Associates, 2003) of 36 work-based learning providers found that providers intending to use e-learning believed that the barriers were: a lack of awareness of e-learning, poor levels of access for learners, financial restrictions and a lack of staff experience.

- A review of e-learning for MKOB LSC (Mackinnon Partnership, 2004a) found that work-based learning providers rely particularly on commitment from employers to enable e-learning to take place, and in some cases, providers have reported difficulties persuading employers of the benefits of allowing learners to access IT equipment. WBL providers often have to overcome the problem of slow learning software because an employer's equipment is old. Many tutors take laptops with them to the workplace for learners to use instead.
- Hampshire and Isle of Wight LSC's e-learning review revealed that most WBL providers use very little e-learning. The reasons for this largely mirror the examples in both MKOB and South Yorkshire and include a lack of equipment onsite (especially in sectors such as construction and hair and beauty).

4.13   The evaluation of the Polymer On-line Learning Pilot (Mackinnon Partnership, 2002) also identified difficulties for some companies in providing access to computers to shop-floor-based injection-moulding machine operators. The companies were concerned about security or the computers were simply not available to use. The pilot showed that responses to this challenge varied depending on the circumstances. For example:

- The learning materials were redesigned with fewer graphics when it became clear that employers either had slow machines or slow internet connections.
- Commitment from employers and, in particular, line managers ensured computer accessibility to learners in the pilot, many of whom did not normally have day-to-day access to one. Commonly, employers identified set times when a computer in an office was not in use, either because the normal user was in a meeting or not at work.
- Commitment from employees meant that, when computers were not available in the workplace, some learners undertook their learning at home.
- Access to the learning materials was most straightforward when the company had a learning centre with computers. However, not all of these computers were internet connected, and the centre might not be accessible when the learner was at work or had time to undertake the learning – for example, during a night shift.

Canary Wharf Construction Workers' Learning Centre

The construction industry has a transient workforce, composed of a fairly high number of non-British workers, and no traditional learning culture, and most workers are spread over many sites and employers and are not office-based.

This project consists of a learning centre located on site in a portable building, where a range of courses are on offer. Although, much of the learning takes place on a less structured basis – for instance, people come to the centre to update their knowledge of health and safety legislation by doing internet-based research, and to look for jobs online.

The existence of a physical learning centre provides a focus for learning activity, and the attention of both employers and employees has been directed towards learning issues in the sector. The portable building is also a Union of Construction and Allied Technical Trades (UCATT) office. Having it in the learning centre sparks initial and continued interest in e-learning among workers because they have increased awareness of what's on offer and spend more time in a learning-focused environment. The e-learning also acts as a hook for foreign workers, especially where visual computer aids can help overcome language barriers.

The project also runs laptop 'taster sessions' in construction workers' canteens during lunchtime. These provide short introductions to basic skills and ICT and demonstrations of other e-learning materials used in courses, such as the 'Body Mapping' exercise (where learners match labels describing injuries and risks to a map of the body). These tend to stimulate interest in further learning.

ICT skills

4.14   According to the Department of Trade and Industry (DTI), 'basic computers and technology skills are now regarded as essential for the majority of jobs.' e-skills UK also considers that the pervasiveness of computer-based applications is currently the main driver of new skills acquisition. This goes some way to explaining our conclusion that e-learning is more common in ICT and hard technical skills than in softer skills.

4.15   The continued uptake of computers is due in part to the revolution in access spearheaded by remote working, but is equally fuelled by new users who view technology as part of the norm. This new attitude typifies young people in the UK, a large majority of whom would be unfamiliar with a world stripped of its technological backdrop. The age divide in adoption of computers is reflected in low usage levels among the 55–64 age group recorded by the Office for National Statistics (2004), who tend to be among the 42 per cent of the UK public who have not accessed the internet.

4.16   The DTI continues: 'Computer-based education and e-learning are vital as they help to develop a broader skills base for all employees, not just those with regular access at work.' Much of the literature suggests that e-learning take-up is increased in workplaces where there is greater use of and access to computers. In addition, some of the evidence suggests that a lack of ICT skills can be a barrier to e-learning take-up. CIPD believes that appropriate strategies must be developed for employees who do not have the necessary skills to use computers, such as promoting the European Computer Driving Licence (ECDL). For example, Warwickshire County Council has sought to create a virtual college for employees. While this was being established, the project manager acted to bridge the gap in employees' ICT skills by securing old council PCs for them to take home free of charge.

JHP Training Leeds: e-NVQs

JHP Training Leeds delivers e-NVQs targeted at call centre operatives in large companies and SMEs. Candidates submit electronic copies of 'evidence' towards their NVQ portfolios (sometimes scanning in paper-based evidence), which are then held online. This is done on using the software supplied by e-NVQ Ltd. As well as the Information Technology Qualification (ITQ), NVQs are being undertaken in administration, management, team leading, customer service, and call handling.

JHP Training Leeds now has over 200 learners taking part in e-learning. This is a very successful uptake in comparison to other areas of the country, where uptake has been rather less. Since the NVQ delivery structure was already in place, any barriers faced in implementing e-NVQs have tended to be directly related to the electronic nature of the learning:

• The type of organisation is a very important factor in determining the success of e-NVQs. They have only really taken off in office-based environments where learners have constant access to computers. Therefore, they have been less successful in retailing and warehousing (except for managers who have constant computer access) and very successful in call centres.
• Familiarity and confidence with ICT, in both learners and assessors, has also been vital for the e-NVQs' success. Again, this explains why workers in call centres have rather seamlessly taken up e-learning. Younger learners have tended to express more interest in it than older ones.
• IT security was one of the initial concerns of a call centre taking up the e-NVQ software.

4.17   While the e-NVQ experience and other literature suggest that there is a need for ICT skills to access e-learning, other projects show that the required level of such skills is not great. For example:

- The Polymer On-line Learning Pilot evaluation found no evidence that a lack of ICT skills acted as a barrier to learning. For example, an older worker with no previous computer experience undertook the e-learning after just a basic introduction (how to switch on the computer and access the internet).
- The project manager at the Canary Wharf Construction Workers' Learning Centre believes that the first half hour, as they get used to using the computer, is critical in terms of engaging learners.

4.18   Either way, in recent years the sheer pervasiveness of computerised technology, even in the smallest business, requires at least one member of staff to possess a minimum level of ICT skills. At the same time, the spread of e-commerce and e-government in the UK has combined with EU legislation to create ever more requirements for the workplace to come to grips with computerisation. We may, therefore, expect the pressure on firms to upgrade and refresh their ICT skills to continue to grow and create a more favourable environment for e-learning to become embedded in UK businesses.

4.19   In addition, the range of initiatives in place to encourage and support employees' IT skills acquisition, such as the e-skills UK IT Passport and the recognition of ICT as a basic skill, will further encourage e-learning take-up.

Learner support

4.20   The Clark and Hooley survey of trends in e-learning found that learner support was cited as nearly as important as the support of senior management to embed e-learning in enterprise training. Availability of both e-tutoring and face-to-face mentoring was also a key success criterion. The sensitive 'blending' of learning and support to harmonise human and technical aspects of e-learning to meet individuals' needs was thought to be especially significant.

4.21   Similarly, an article on the professional development experiences of web-based e-learning by general practitioners in health and social care (Jamieson, 2004) noted that 'the single issue which stands out in relation to the distance learning that the interviewees have undertaken is the importance of either the presence or the absence of support, most of it online where it exists.' Available support, either by a peer group of learners or a tutor, confirmed for learners that they are getting the best from the courses they are doing.

4.22   A current trade union guide to supporting e-learning in the workplace (TUC, 2004a) highlights the need for adequate, tailored learner support that draws on differential levels and types of support skills, depending on course content and learners' familiarity with ICT. Help needed by learners can include support when working through the course itself, understanding the course concepts, hints for improving performance and discussing learning points with others, including online communication skills.

4.23 Many of the projects we have identified include tutor support of some kind. This includes:

- courses embedded with online tutor and peer support, as in the case of the Certificate in Online Learning
- a tutor who works with the employer to identify basic skill needs of the workforce and then helps tailor and deliver the support, as in the Surrey Flagship Project
- primarily technical support aimed at supporting access to the learning materials. For example, the Polymer On-line Learning Pilot provided online and telephone tutor support, but found that it was little used except to address technical problems and to help remind learners of deadlines.

British Gas Real World Environment for Service Engineers

Targetting British Gas service engineers and modern apprentices, this project aims to upgrade and enhance their skills relating to fault diagnosis, through multimedia software that creates a 3D simulation of a typical customer's home.

The learning is delivered to engineers in groups of four to six, with a technical trainer in a training centre or other facility. The group is taken through the initial tutorial together, although the level of interaction between them is low as they are all work separately and wear earphones. The trainer's role is to address any technical problems with the software and to assist, where necessary, with the tutorials.

The 2005 target is to provide four hours of training using this system for each of British Gas's 8,000 service engineers.

ESiB

The learning offered by e-skills into business (ESiB) is generally accessed in the workplace, but this is complemented by a system of telephone tutor support during office hours. When the project was piloted, course content tutor support was provided, but there was little demand for it, so the support system is now mainly occupied in answering technical and navigational queries.

4.24 It is important to recognise that learner support can be gained from people other than tutors and fellow learners. Workplace colleagues and line managers can be an extra source of support, particularly where the learning is directly related to an employee's day-to-day activity. This can sometimes reduce the need for subject-focused tutor support, although external support can be vital where the workplace does not possess the appropriate knowledge.

CIPD Certificate in Online Learning (COL)

CIPD developed the COL course in partnership with Sheffield College and the South Yorkshire Further Education Consortium. The course has been delivered entirely online since 2001 and is aimed at anyone interested in setting up online learning within the workplace.

Since 2001, the course has been taken annually by three cohorts of learners, typically consisting of about 20 learners who are divided into smaller groups or 'learning sets' of five or six. The learning draws on extensive tutor and peer support, with two experts in online mentoring available to each student. Support from peers as well as tutors is embedded into the course design. The COL encourages peer collaboration through the use of the small, interactive learning sets that promote team working and lead to the development of enhanced online communication skills, with alumni networks in place for continued contact after course completion.

The COL is intended to be accessible to people with all levels of IT literacy. It is accredited by the Open College Network, based on course and activity completion, evidence of collaborative working and portfolio submission.

Learner feedback on quality has been uniformly excellent, and retention rates are consistently high at well over 80 per cent. The course offers several entry points throughout the academic year, and recruits from a mix of (mainly large) public- and private-sector employers. In response to learner demand, an Advanced Certificate in Online Learning (ACOL) course has now also been developed to offer progression for successful learners.

Course fees (upwards of £1,200 for non-CIPD members) provide an ongoing income stream that is self-sustaining.

Integrating e-learning

4.25   Much of the literature – including the Distributed and Electronic Learning Group (DELG) report and the Unified E-Learning Strategy Consultation – focuses on the benefits of integrating e-learning with other delivery methods. This is known as 'blended learning'. The CIPD acknowledges a common message: that the best way forward is to seek out blended learning solutions that include varying levels of e-learning adapted to suit different learning contexts.

4.26   A recent survey (Balance Learning/American Society for Training and Development, 2004) of nearly 300 US and UK companies projected that blended learning will comprise nearly one third of all corporate training by 2006, compared with instructor-led training, which is expected to fall to 38 per cent over the same period. The survey defined 'blended learning' as learning programmes that include multiple methods of delivery, such as instructor-led classes, online instruction, on-the-job activities, and supplemental reading. In the US, it was seen as the most effective and cost-efficient form of e-learning by nearly 80 per cent of responding businesses. In the UK, it was preferred by 55 per cent of companies, and ranks as the fourth most effective training approach (after instructor led-training, on-the-job training and coaching) and the third most efficient training method (after on-the-job training and coaching).

Table 4.1 Comparison of predicted 'blended learning' use in the UK and US

	UK	US
Use of blended learning	55%	77%
Of which:		
Management and leadership training	67%	44%
Customer service training	41%	46%
Interpersonal skill training	52%	40%

Source: Balance Learning/American Society of Training and Development, 2004

4.27 The survey into e-learning recently conducted by the CIPD (2004) confirms that many of the issues highlighted in the Balance Learning/ASTD report also apply in the UK. The CIPD survey found that over 80 per cent of companies believe that e-learning is more effective when combined/blended with more traditional forms of learning. The CIPD has also expressed the view, based on feedback from members, that blended learning is seen by many as a process in which appropriate e-learning modules are a precursor to a training session in the classroom (Sloman and Rolph, 2003).

4.28 The recent mapping of regional and local e-learning activity (Hale Consulting, 2004) found that e-learning activity has increasingly been integrated into other learning as opposed to being seen as a separate activity. While this reflects the trends already identified, it makes it much more difficult to identify e-learning activity and to track trends and establish best practice.

Canary Wharf Construction Workers' Learning Centre

The aim is to widen participation to a group of workers traditionally excluded from learning. Many of these potential learners have never used computers before and are intimidated by the prospect.

The introduction to learning is done very gradually by slowly increasing familiarity with learning. Its blended nature has been important in initiating and sustaining learners' confidence. Every course on offer (except ESOL) has a computer-based element, but the type of e-learning varies from 100 per cent online testing for the health and safety one-day course, to electronic diagrams for the body mapping exercise, and to internet research and word processing as part of completing assignments for the health and safety representative courses. Paper-based manuals are also included with many of the courses.

Implementing and delivering e-learning

4.29 A significant difference between work-based e-learning and other types of e-learning is that it is businesses rather than learning providers that implement its delivery. Respondents to the CIPD survey (2004) believed that more attention should be paid to the implementation of e-learning programmes, including support from line managers and developing a structure that met the needs of both employees and the organisation itself. In contrast, the survey of practitioners by Clark and Hooley concludes that e-learning will happen *despite* rather than *because* of top management in large organisations. They concluded that, although senior management support is important, particularly in small firms, it is the 'learning champions' and line managers who drive change in larger organisations.

4.30   The Hill and Kappler (2004) research with large firms reported that 42 per cent of those already using e-learning felt that the greatest challenge in successful implementation of e-learning was overcoming users' objections to cultural change. The CIPD survey reported that 69 per cent of respondents believe that e-learning demands an entirely new skill set for people involved in training and development.

4.31   The SFEDI/Ufi research to gather small businesses' views on e-learning (SFEDI, 2004) reported that SMEs identified two resources that, they felt, would greatly support investigating e-learning options. These were:

- a vetted directory of useful sites and resources with embedded quality assurance
- a knowledge base of shared owner/manager experiences of e-learning that addressed common problems in appropriate language.

4.32   These comments reinforce the view that SMEs feel that they lack knowledge about e-learning.

4.33   Although work-based learning delivery is just part of the activity of FE colleges, the *ILT Monitoring Survey* (LSC, 2004c) shows that nearly all colleges (87%) offer development programmes to support staff who wish to develop or adapt electronic learning materials. This can take a number of forms:

- support from ILT champions (75%)
- support from technical staff (74%)
- other support, including support from other members of staff, either one-to-one or mentoring (32%).

4.34   Several colleges also mention the deployment of a dedicated materials development team. Others offer some remission of time, loans of laptops or other equipment, and sometimes funding.

4.35   Reviews of LSC-funded work-based learning providers undertaken by South Yorkshire, MKOB, and Hampshire and Isle of Wight LLSCs agree that a lack of knowledge and skills to deliver e-learning are barriers to its wider use by providers.

Changes in technology

4.36   Technology is constantly evolving and this will continue to impact on work-based e-learning. The CIPD survey found that, while CD-ROMs remain the most popular method of e-learning delivery, with 73 per cent of respondents using them, 58 per cent feel that the current generation of e-learning products is not indicative of the future.

4.37   Future areas for development include investigating the potential of mobile technologies and the use of simulations and other new learning methodologies such as games, sometimes in combination. Fuel Group (Dineen, 2004) reported on developing e-learning applications for large company clients that have mobile field forces, such as BT, Cable & Wireless, Thus, Colt, NTL, Canon and BP. The convergence of mobile phone and PDA technologies has made it possible to think beyond laptops when developing new e-learning interfaces. Videophones and voice activation systems add further features to potentially powerful multimedia tools. At this stage of development, provision of innovative content is well placed to drive forward demand for equipment acquisition, as was demonstrated by the uptake of satellite television.

4.38   A recent business briefing (FEDS Business Forum on Lifelong Learning, 2004) highlighted new directions for online courses in corporate training. These are beginning to adopt some of the latest technologies from the world of games. The research firm IDC estimates that 8–10 per cent of the US corporate e-learning market uses technology-based simulations, and predicts this to rise to 40 per cent by 2008. A literature review of the use of computer games in learning, undertaken by Ultralab and the Learning and Skills Development Agency (Mitchel and Savill-Smith, 2004), found that 'in the context of lifelong learning, simulation games afford a realistic framework to use technologies as a means to an end and so can prepare learners for the world of work.'

4.39   There are two common types of games based on e-learning: branching, where users are presented with information and then engage in a simple game of matching question and answer; and simulations, which offer a 3D experience that resembles a video game. Training simulations, which can be customised for different groups, have been enthusiastically embraced by the health market. Interest is demonstrated by such events as the Games for Health 2004 Conference: the first meeting of developers, researchers and health professionals in the area of training games.

British Gas Real World Environment for Service Engineers

Multimedia software is used to create a 3D simulation of a typical customer's home and to develop a scenario where the engineer must interact with a customer and repair a fault in the boiler. There are eight available scenarios: four each involving two different kinds of boilers. Each scenario includes different random events, plus artificially intelligent actions and consequences arising from the engineer's actions. The program runs on the laptops issued to the engineers, which they use as an integral part of their work, and in national training centres for the modern apprenticeships.

Once the tutorial is completed, each individual engineer can chose which of the scenarios to complete next. From this point, the training experience can be very different for each person involved. The aim is to complete any four (or more) of the eight scenarios on the same day. The engineers are free to complete any additional scenarios in their own time, as the software will remain available on their laptops.

The training has been well received by engineers and by the trainers involved in delivering it. One trainer we spoke to described it as a 'great concept', and others expressed a desire to see it maintained and further developed. The engineers found the 'Real World Environment' to be practical, real and enjoyable.

4.40   In the literature, there are warnings about learning becoming too technology focused. A number of commentators argue that e-learning should be driven by training and not by technology. Jamieson's research (2004) with general practitioners in health and social care revealed that not all enthusiastic computer users preferred using the computer screen for all tasks; for some, the advantages of handling paper still outweighed the power and flexibility of the computer interface.

4.41   Our review provides some examples of the danger of focusing too much on the use of new technology. For example, an e-learning project initiated by Hertford Regional College in association with the Construction Industry Training Board (CITB) aimed to deliver NVQ-level training in subjects such as brickwork, carpentry and joinery, and painting and decorating. It was envisaged that this training would be delivered through various forms of technology such as personal digital assistants (PDAs) and WAP (wireless application protocol) on mobile phones. For various reasons, such as poor battery life and durability, simple PDAs and WAP were discounted. The delivery method that was eventually settled on combined the functions of a PDA with those of a pocket PC notebook. This allowed users to connect to the internet, receive email and download files.

4.42   Crucially, those involved in the project discovered that, in wrestling with the IT issues to make the systems work, they lost sight of the fact that the e-learning approach was adding nothing but inconvenience to the learner's experience. This prompted a change in approach and the college turned to the CD-ROM route. They discarded the hardware they were using to deliver the training and adopted the more traditional PC notebook, and they bought construction skills and key skills materials from a local software company. In a final evaluation, it was clear that this approach was much favoured by the students and employers involved (Hertford Regional College, 2002).

Costs of e-learning

4.43   It is unclear from the literature whether work-based e-learning can be used to reduce learning costs or whether it is a tool for increasing the quality and effectiveness of training. The Clark and Hooley survey of practitioners found that the latter believed that greater flexibility and greater access to learning are the chief benefits that organisations will look to e-learning to provide, rather than simply reductions in cost. The CIPD agrees that e-learning should be seen as a change initiative rather than a way of making short-term savings.

4.44   The recent Hill and Kappler research with 503 large companies found that the most significant benefits of e-learning related to greater flexibility and accessibility of learning. However, the greatest successes of e-learning were thought by companies to be changing attitudes to learning and training and reducing the costs of training whilst increasing its use. Companies employed a range of methods to measure the effectiveness of e-learning – from quantitative measures, such as number of IT qualifications and examination passes, modules undertaken and completed and staff promoted, to qualitative measures that related to return on investment. In the latter, reduced travel costs, increased time spent at work and ease of delivery to a distributed workforce were all cited.

4.45   Factiva, a content provider and e-learning company owned by Dow Jones and Reuters, notes that all of the savings and business benefits that result from delivering learning quickly and accurately via e-learning platforms must be balanced against the cost of developing and implementing them. According to the American Society for Training and Development (Anderson, 2002), depending on the scale of the e-learning implementation, such costs can include:

- the courseware itself
- authoring software (if the courseware development is done in-house)
- learning management systems (for tracking enrolment, participation and completion rates)
- purchase/licensing of web-based software
- IT system enhancements or upgrades.

4.46   Many of the projects we identified in our review were pilots and have not been taken forward. We found a number of e-learning projects that consider themselves self-sustaining, but in at least two of these cases, this does not take into account the costs of developing the e-learning material, which were funded by the public sector. It is also too early to identify to what extent these projects are self sustaining in the long term, particularly if materials need updating or new materials have to be developed.

British Gas Real World Environment for Service Engineers

British Gas had previous experience with computer-based training, which was implemented in an attempt to reduce training costs. However, there were some problems with this, particularly in relation to quality. The goal with the Real World Environment (RWE) training is to provide better, not cheaper training. In fact, initially it is an expensive way of delivering training, because of the cost of the development and setting up of the hardware. This may make this sort of material unviable for less well-resourced companies without a large number of learners to target.

The training is intended to result in measurable changes in a series of performance indicators. Although British Gas wishes to keep these figures confidential, we are able to report that there have been clear improvements in all the indicators, including:

• first-time fix
• job recall rate
• part usage/cost
• customer complaints
• volume of calls to the National Technical Helpdesk
• joint visits with appliances manufacturers.

ESiB

The ESiB evaluation (Turner, 2002) found that users identified the following long-term business benefits of using the ESiB process:

• cost savings
• greater awareness of potential business opportunities
• greater awareness of what's actually happening in the business
• greater customer focus
• clear strategic direction
• production of a skilled, adaptable workforce
• enhanced performance using IT
• increased staff motivation.

Interestingly, perceived value was positively related to the cost to the user. Those who paid for the product perceived it to be more useful than those who had received it free of charge.

Evaluation

4.47   It is important to note that our review identified a great deal of literature and evidence describing projects that were using e-learning in the workplace, but with the exception of some case studies with large corporations and the two Ufi studies noted here, there was very little unbiased published evidence evaluating the effectiveness and impact of e-learning. We are, therefore, not sure what has happened to many of the projects we have identified, many of which were pilots. Without this evidence, it is very difficult to identify the benefits of e-learning and learn what works in what circumstances. This is likely to be made even more difficult with the increase in blended learning. It is unclear whether this lack of evidence is because evaluation and impact assessment is:

- being undertaken, but not published
- not being undertaken because it is not included in project plans
- not being undertaken because it is perceived as too difficult to undertake.

4.48   Our own experience suggests that evidence of e-learning benefits and efficacy is collected, although it is not necessarily being published or separated out from other learning aspects. This evidence tends to be in terms of learner satisfaction with learning and the completion of learning. Very rarely is any evidence collected on the impact of learning on behaviour or on an organisation. This partly reflects the difficulty of measuring the impact of any learning. Where such evaluation does happen, it is often done in a qualitative way and undertaken quite soon after the learning has taken place. As result, longer-term impacts are not being identified.

5 Conclusions

5.1   Our research has reviewed the available evidence on work-based e-learning in terms of:

- trends in the work-based e-learning market
- the public policy context
- examples of work-based e-learning implementation
- challenges identified and examples of responses.

5.2   We conclude that there is general agreement among industry commentators that the take-up of e-learning is increasing, particularly among larger employers, but that growth over the last few years has not been as great as expected. This may be because of the reporting of previously unrealistic expectations during the 'dot-com' boom. It is important to highlight that this view is based on fragmented and patchy evidence; there is little unbiased, consistent evidence to illustrate the extent of this take-up or recent growth. Similarly, while there is some disagreement over its extent, it is likely that e-learning uptake will continue to grow. Particular trends include:

- the use of new technologies as they become available and as new methods of delivering e-learning are identified
- the wider use in work-based e-learning of simulations and other learning methods such as games
- the increasing integration of technology-supported learning with more traditional learning methods, sometimes described as 'blended learning'
- greater customisation of e-learning to meet the needs of specific sectors, occupations and businesses
- an increasing focus on using e-learning to increase the effectiveness of learning rather than to reduce costs. Larger employers are increasingly taking into account the benefits of e-learning that arise from better trained employees and improved performance as well as any potential to reduce training delivery costs.

5.3   The public policy landscape is changing, now including:

- a greater focus on demand-led, publicly funded, work-based learning provision. This new focus is likely to lead not only to an increase in the demand for work-based learning, but also to an increase in demand for short-term, focused, flexibly delivered learning provision. This is the type of learning that many commentators believe can be delivered effectively through e-learning.
- the introduction of a credit-based qualifications framework. This will make it easier for short-term, employer-focused, flexible learning units to be recognised as parts of qualifications and, as such, will make it easier for the public sector to prioritise and fund them.
- the introduction of e-assessment could reduce some of the barriers to learning by allowing assessment to be undertaken at a time and place to suit the learner. It can also provide more immediate feedback and provide alternative assessment opportunities such as the identification of the skills needs of both businesses and employees.
- the better co-ordination of post-16 e-learning policy and implementation and its integration into existing activity – for example, through the extension of the National Learning Network programme and its integration into the LLSC strategic area reviews. This will help to ensure that the value of e-learning in the workplace is understood and that any e-learning developed is sustainable.

5.4   These changes could potentially raise the demand for work-based learning. In addition, they could allow employers to use public funds to support more flexible training that meets specific employer and employee needs than is currently available. They may also provide a more supportive framework in which work-based e-learning can thrive and prove its value.

5.5   There is great variety in the type of work-based e-learning being implemented, in the context that it is being undertaken and in the types of providers delivering it. We are unclear to what extent these activities are small-scale pilots or large-scale, long-term implementations. Our view is that many are the former. Work-based e-learning is still relatively young, and providers and employers are still trying to identify how it can be used most effectively to improve the effectiveness of learning in the workplace.

5.6   Our review identified a number of challenges in relation to the implementation of work-based e-learning. These include:

- the lack of awareness of and engagement with e-learning among employers, particularly among SMEs. There is a need to link e-learning to the specific needs of a business and to understand the drivers of business change. Projects in which learning materials have been developed in close partnership with specific employers or which include a form of business diagnostic service appear to be successful in engaging employers. One project we identified seems to be using an online diagnostic service successfully.
- the need to engage employees. The literature suggests that there are many barriers to employees undertaking e-learning. However, where e-learning is linked very closely to day-to-day tasks, it is more successful.
- the availability and access to ICT. This is identified as a key barrier to workplace e-learning, particularly in sectors where there is low computer penetration or where learners do not use computers on a daily basis. In addition, many workplace computers are not linked to the internet, which can create connectivity barriers. The potential responses include:
  - ensuring that learning materials do not use unnecessary graphical content, which may create accessibility barriers to learners
  - engaging the workforce so that colleagues are flexible enough to provide access to computers for learners
  - ensuring that learning can be undertaken from home
  - providing laptops for use by employees in the workplace
  - establishing workplace learning centres.
- a lack of ICT skills. There is mixed evidence on the extent to which a lack of ICT skills can be a barrier for workplace e-learning. E-learning appears to have more penetration in sectors where employees use computers as part of their work. However, some project-based evidence suggests that learners can effectively use e-learning with very little ICT knowledge. The key appears to be to provide support for learners in the initial stages.
- the lack of skills and knowledge to implement e-learning. This can include employers' knowledge of the availability of e-learning materials, the skills of employers to establish and implement e-learning activity, and the skills of learning providers to establish, implement and support e-learning in the workplace.
- the high upfront costs of developing e-learning materials can be a barrier to developing the employer-focused, work-based e-learning that employers want. Large companies can invest in the development of tailor-made learning materials as they have the size of workforce to make the return viable, particularly if they take into account the increase in employees' performance. Smaller companies are limited to off-the-shelf learning materials unless they develop them in partnership with other employers.

5.7   Our review also identified a number of trends in the successful implementation of e-learning in the workplace. These include:

- the provision of tutor support for e-learning. The evidence suggests that the learning experience is better and completion rates are greater where there is tutor support: face to face, online or over the telephone. However, some project evidence suggests that the support required is often limited to technical ICT-related issues and maintaining progression. This may be because of peer support available in the workplace or such support built into the learning.
- the increasing integration of e-learning with traditional forms of learning. The evidence suggests that many employers believe that e-learning is most successful when combined with other forms of learning.
- changes in technology that can further enhance the e-learning experience. For example, it is thought that mobile technology can increase access, while games software techniques will be increasingly used in simulation-style learning materials. However, some project evidence warns against focusing too much on the technological aspects of the learning materials and not enough on the learning itself.

5.8   Our most striking conclusion from the review is the lack of objective published evidence relating to the effectiveness or impact of work-based e-learning. The trends identified in this review suggest that specific employer- and employee-focused e-learning appears to be the most effective, and therefore there may be limitations in the ability of projects to share good practice. However, the current information vacuum means that there is very little understanding, even in specific contexts, of what has been tried and what works or not.

5.9   Given that work-based e-learning is still a relatively young and evolving concept, we believe that it is essential that there is greater formal sharing of experience with and evidence of the use, effectiveness and impact of work-based e-learning activities. The increasing integration of e-learning with other forms of learning will make this more complicated, as it will be difficult to isolate the issues relating to the 'e' aspect of the learning.

Implications for Phases 2 and 3 research

5.10   This research provides an overview of the current evidence in relation to work-based e-learning and provides the foundation for further primary research. The review suggests that key areas of investigation should include:

- an increase in the knowledge base in relation to the scale and type of work-based e-learning activity being undertaken. For example, the following questions should be answered:
    - What is the level of public-sector e-learning activity being undertaken, particularly in terms of its size and sustainability? Is all the activity being undertaken through small pilots or are there a large number of sustainable e-learning projects?
    - What is e-learning being used for? Our review identified a wide range of activity, but there was little evidence of the extent to which it is being used in each area.
    - What e-learning activity is planned?
    - What overall evidence is there for the effectiveness or usefulness of e-learning? In particular, which projects, if any, are collecting this evidence?
    - Which models, if any, are being used to investigate the effectiveness of e-learning?
- a more extensive investigation of some of the barriers to and challenges of work-based e-learning take-up that have been identified in this review and some of the activities that can be undertaken to address these barriers
- an identification of what the findings mean for Becta and its partners.

5.11   A major consideration for the remaining phase of the project is how we define work-based e-learning in relation to other learning activities and, therefore, identify the issues associated with the 'e' aspect of e-learning.

Implications for future activity

5.12   The implications for future activity in relation to work-based learning will be investigated further in Phases 2 and 3. We present some initial indication of the issues identified in this review and some areas of action for partners to consider.

- *Issue 1*: The changing public policy context potentially removes many of the barriers to the development and take-up of publicly funded work-based e-learning. The challenges for partners are to:
    - ensure that implementation of these policies does remove barriers and does not create new ones
    - encourage and support work-based learning providers and employers to take advantage of the changing policy context to develop and use more e-learning where it is appropriate.
- *Issue 2*: A key barrier to take-up of e-learning among SMEs is the lack of engagement with learning, partly because SMEs find it difficult to identify learning needs and relate them to business needs. Some of the evidence suggests that e-learning-based business-assessment tools may help overcome these barriers. Partners should consider:
    - developing e-learning models for encouraging business engagement and business and skills need identification
    - encouraging and supporting the development of business-assessment and skills-assessment tools, including the sharing of good practice.
- *Issue 3*: Access to computers and the internet can be a further barrier to the take-up of e-learning in the workplace. Partners should consider:
    - sharing best practice in terms of supporting access to ICT in the workplace
    - encouraging and supporting ICT provision in the workplace where appropriate.
- *Issue 4*: Many work-based learning providers and employers lack the skills and knowledge to implement and deliver e-learning. Partners should consider how to support the development of:
    - the skills and knowledge of business managers to identify, develop and implement e-learning in their workplaces, particularly within SMEs
    - the skills and knowledge of the staff of work-based learning providers
    - models of sustainable work-based e-learning development, particularly in SMEs
    - context-specific e-learning materials including simulations, particularly among SMEs
    - more formal evaluations of e-learning and the sharing of evidence between providers and employers
    - mechanisms to share best practice and experiences of work-based e-learning activity.

Appendix A: Organisations contacted

• Adult Learning Inspectorate
• Association of Learning Providers
• Barnfield College
• British Gas
• CITB
• Cogent
• Energy and Utility Skills
• e-NVQ Ltd
• e-skills UK
• Financial Services Sector Skills Council
• Goskills
• Improve
• JHP Training
• Learning and Skills council
• Lewisham College
• Logicom
• PARD, University of Warwick
• People 1st
• Proskills
• SEMTA
• Skills for Logistics
• Skillset
• Sun Microsystems
• TUC
• UCATT
• UK Healthcare Education Partnership
• University for Industry
• West Nottinghamshire College