Optimising work-based e-learning in small and medium-sized enterprises: contemporary challenges

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Abstract: This article explores practical and policy issues involved in engaging small and medium-sized enterprises (SMEs) in e-learning for work-based learning. It considers the organisational context for e-learning and explores ways of optimising the process of learning for different types of employee, then outlines the findings of an investigative study on work-based learning by universities in Wales, UK. The article also assesses four types of influences on learning in SMEs and the impact of e-communication, in addition to exploring the issue of sustainable provision and measures of success from a small firm perspective. Finally, the article reflects on European policy recommendations and concludes by proposing directions for a research agenda.

Keywords: work-based learning; e-learning; e-communications; optimisation; evaluation; small and medium-sized enterprises (SMEs)

E-learning benefits for enterprises

E-learning has apparent and potential benefits that make it an attractive application for firms in recessionary times. These potential benefits for managers and employees arise principally from greater flexibility, cost-effectiveness and accessibility, as learners can gain access from their work premises, at home or from off-site locations, at times of their choosing. It can also serve to reduce attendance costs, absences from the workplace. This article begins by examining the interpretations of e-learning, the methodology and the challenges of working with the SME (small and medium-sized enterprise) sector. This leads into considering the emerging themes on work-based learning in Wales, influences on learning, peer learning, issues of sustainability, measuring success and policy concerns. The article concludes by proposing a portfolio of contemporary research issues.

E-learning and informal learning

‘E-learning’ means different things to different people. The term has a degree of elasticity in its meaning and is a short-hand term for the ways people communicate and learn electronically. For some, the ‘e’ prefix stands for ‘everything’: e-commerce, e-business and e-learning (Katz & Oblinger, 2000). For Katz and Oliver, the Internet would fundamentally change the landscape of education so that e-learning would become all pervasive, ubiquitous and indispensable. In learning more specifically, the ‘e’ can infer engagement of the learner, enhancement of the learning experience, ease of use, empowerment of the
learner to control his or her learning schedule and pathway and execution of the learning program (Roffe, 2002). E-learning is, therefore, a term used interchangeably in a wide variety of contexts and from diverse perspectives. It infers improvement in human performance through technology-supported learning, and offers more personalised value than just the insertion and application of a computer into the processes of communication, data collection, database manipulation, information storage and presentation.

The organisational context essentially shapes the interpretation of e-learning. In the United States, one of the earliest definitions came from the American Society for Training and Development (ASTD, 2009), who define it as embracing a wide set of applications and processes, such as Web-based learning, computer-based learning, virtual classrooms and digital collaboration. The ASTD definition essentially considers anything that is electronic and involves learning to be e-learning, including, for example, delivery of content by satellite broadcast, CD-ROM or audio and video tape.

In universities, e-learning can define the mode of attendance as a form of distance education where the students study online and rarely, if ever, visit campus facilities. Blended learning is a variant – the combination of e-learning and classroom learning that aims to deploy the best features of both modes (Voci & Young, 2001) – and for many universities this is the predominant impact. E-learning, as a result, is now a core service provision for universities. As educational enterprises it provides them with a range of benefits, which include enriching the campus learning experience, managing learning experiences, as well as enabling new market development and extension through providing access to the concentration of university assets and expertise to new learners, such as employees undertaking work-based learning.

In corporate enterprises, e-learning refers to strategies and processes that make use of electronic or networked solutions to support the training of employees. E-learning can be applied to a range of work-based learning situations within an organisation, for example business tools, leadership, legal compliance training, sales training, staff induction and technical certification (Tai, 2007). The range of e-learning applications includes self-study, tutor-led, Internet-based training, knowledge management and electronic performance support systems (EPSS’s). The outcomes and experiences of applications in certain large-sized enterprises, however, should not be generalised to all enterprises or to all e-learning applications. Certainly, applications in small enterprises should not be extrapolated from the results and findings in large-sized enterprises. There are differences in objectives, size, scope, nature of business as well as e-learning applications.

What is recognised as 'learning' can also vary. Often universities tend not to value learning unless it can be evidenced, assessed and categorised with reference to the framework of academic disciplines that are recognised as knowledge (Coffield, 2000; Moss, 2001) or are able to clarify it (Sutherland, Facer, Furlong & Furlong, 2001). Yet there is a body of knowledge that is valued in the workplace and is acquired in different ways than in universities – through informal learning (Cross, 2007).

The European Commission (EC) definition of informal learning is “self-learning which is not part of either formal or non-formal education and training, by using different methods like books, computers, learning centres or educational broadcasting” (Kailis & Pilos, 2005, p. 1). Knowledge management initiatives are also germane. Such initiatives that allow connections between people to improve the performance of an organisation by providing knowledge creation and sharing can also provide a contribution to learning when it is part of the fabric of an organisation (Nonaka & Konno, 2005; Leibonitz, 1999). A direct link apparently exists between the transfer of explicit knowledge and organisational performance (Dhanaraj, Lyles, Steensma & Tihanyi, 2004). A definitional consensus of ‘learning’ is therefore emerging that emphasises access to knowledge and information, participation in a community of practice (CoP), learning reflection, communication and collaborative development of experience,
knowledge and understanding (Smith, 2006; Sefton-Green, 2004). Learning, therefore, possesses certain inherent complexities and variables.

Many variables also affect learning in an SME, making this a market segment with its own complexities. Optimising learning is the process of modifying learning to make it more efficient or so that it uses fewer resources. This is a particular challenge for SME managers and advisers; the challenges include self-diagnosis of skill needs and the appropriate quality, timing and location of learning (Roffe, 2004). There also appears to be a continuum of learning extending from formal learning, to informal learning and ‘e-learning 1.0’ methods (in which technology is used to imitate an instructor-led program and content used to guide a learner). In light of the above, an investigation into what influences e-learning adoption in the SME workplace, learning optimisation and the criteria for sustainable delivery, leading to inferences for a research agenda, was conducted through performance consultancies with enterprises in Wales.

**Methodology**

The methodology adopted for the investigation involved a multiple case study design comprising nine SME owner-managers in west Wales. Yin (1994) describes a case study as “an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (p. 13). As a research instrument, its ability to measure and record behaviour at close range is valuable. It allows the researcher and participants to interpret the reality of their experiences and build up a grounded understanding of how that behaviour has taken place (Chetty, 1996). The method allows similarities and differences to be examined across a group of cases, with fine discrimination between these cases possible. The case study method is considered a more appropriate strategy where the research question is seeking answers to how and why and where control of events is not possible and/or essential.

The selection of cases was made from a population of entrepreneur-led SMEs who engaged with a performance development program conducted by the University of Wales, Lampeter aimed at assisting them to manage growth in their companies. The selection of cases was based on three criteria. First, all the entrepreneurs were experiencing rapid change in their firms due to the impact of technology. Second, the entrepreneurs had worked closely with the researcher which developed trust and this allowed greater opportunities for close examination of their business activities. Third, all the cases were attempting to grow and located in the same geographical area.

In engaging in the performance consultancies, the researcher set out to capture a wide set of business information, including business goals and performance indicators, as well as perceptions of e-learning for human resource development (HRD). Performance consulting analysis can provide strategic and operational benefits for a firm as well as reveal strategic and operational business drivers. Interviews were carried out in the SMEs’ premises with the entrepreneur directing the business, functional managers and other relevant employees suggested by management. The data was analysed by looking for key ideas and concepts in strategies, influences and links with value chain operations, especially the applications of e-learning for HRD. Quantitative and qualitative data was derived from firms over the past five years, although the data considered in the present article is limited to the last three years. The qualitative data reflects experiences that go beyond the period, however, and projects future plans and activities. Information on various other cases is also presented and referenced to illuminate additional qualitative features.

**Optimising learning for SMEs**

SMEs are widely seen as a vital component for economic competitiveness. Addressing their development needs effectively is, therefore, crucial for wealth creation in a region. There is
no single definition of an SME, although the UK Department for Business, Innovation & Skills (BIS, 2009) defines SMEs as businesses with fewer than 250 employees. Other commonly used definitions also take turnover and balance sheet information into account. The EC (2009), for example, determines an SME to be an enterprise with fewer than 250 employees, turnover of 50 million Euros or less, or a balance sheet total of 43 million Euros or less. The notion of a generic enterprise based on size might be beguiling, but is still profoundly misleading. It is convenient to classify enterprises by the number of employees and size of turnover, but companies that make up the group of SME firms are in reality very heterogeneous. Companies are drawn from every industrial sector and at all stages of an enterprise life cycle. Indeed, the only common denominator is size and the accompanying resource limitations this brings. Hence, it is difficult to generalise results.

The economic importance attached to SMEs seems justified, because they are the backbone of wealth creation in most countries and regions. SMEs contribute about 40% to the UK Gross Domestic Product (GDP), employ over 13.5 million people and comprise 99.9% of UK businesses (BERR, 2008). They are a large and important source of employment, while the taxes paid by them and their employees provide vital financial support for government policies. Even in regions where employment is dominated by large-sized enterprises, SMEs still play a crucial role as suppliers, subcontractors or retail enterprises. Their limited internal resources and capacity mean that they often need external services to help with economic and technological change. Their size, though, mean that they can be more adaptable.

Work-based learning is a key approach in SMEs. It “is much more focused on learning in the workplace [than work-related learning], … [and is] derived from work undertaken for or by an employer (i.e. in paid or unpaid work). It involves the gaining of competencies and knowledge in the workplace” (Connor, 2004, p. 2). Formal and informal learning are both important methods of workforce development. While companies may invest in formal learning activities such as training courses and seminars, employees also engage in informal learning in the course of participating in everyday work tasks to meet organisational and individual goals (Watkins & Marsick, 1992). Activities for developing the workforce in SMEs are often informal in the sense that they might be in-company activities provided by personnel of the enterprise itself. Indeed, SMEs often only resort to the training market when they need to obtain specific skills that are not available within the company. Many studies on SMEs reveal a considerable degree of unplanned, unsystematic, reactive and informal training, where there is unlikely to be a personnel officer involved (Gibb, 1997; Metcalf, Walling & Fogarty, 1994).

In a study of influences on e-learning in entrepreneur-led SMEs, employees are seen to use a range of technology applications for resource investigation, collaboration and communications (Roffe, 2007). The business managers studied recognised that Internet technology, in its different forms, offered great potential or application in value chain activities, from improving production processes, through to reaching customers. E-communication in its different forms is a key operational requirement that provides a strong learning infrastructure. According to Roffe (2007), in many cases in SMEs the use of such e-communications has precedence over e-training and formal learning. Tensions exist, though, between the perception of some SME managers that Internet use is a leisure activity for employees, and its practical use by knowledge workers as a channel for communication and informal learning.

Whereas direct control on site is preferred by some SME managers, other managers from enterprises of all sizes more generally see the potential that information and communication technologies (ICTs), for example the flexibility it affords in terms of where work is carried out. This flexibility gives rise to the phenomenon of ‘e-work’, which now applies both to employees within an organisation and to outsourcing work. E-work is a term that has emerged to describe any work that is carried out away from an establishment, and whose receipt and delivery is managed from that establishment using ICTs (Huws & O’Regan, 2001). This means that the processing of information can be located wherever the infrastructure exists and
workers can be found with the right skills. Huws and O’Regan (2001) report that e-work is taking place on a significant scale in Europe, with the most likely functions carried out remotely being software development and support; creative functions (e.g., design, research and development); management, training and human resource management; and customer services.

Optimising learning is a key challenge for SME managers. Individuals, teams, business units and the enterprise as a whole need to continuously learn about new approaches and new opportunities to meet business needs. Learning methods in the organisation include research, design, experimentation, problem-solving, collaboration, and are not simply restricted to conventional formal learning. Quinn (2009) maintains that most formal learning essentially addresses novices, giving them motivation, foundation and a critical skill set for the workplace. Practitioners, he argues, can then do with less formal learning methods and only need access to performance support tools, information updates and mentoring. Experts then, at the top of the competence spectrum, need individuals to collaborate with and gain most value from informal learning methods. Getting the balance right is crucial. Assuming that all employees are autonomous learners capable and motivated to engage with e-learning could be as much a mistake as would supposing that only formal learning is valid. Supporting individual employee development is necessary, as is ensuring that this is reflected in the culture of the enterprise. Several steps are needed to achieve this, according to Quinn. First, organisations need to deepen their understanding of formal learning. Second, organisations need to make performance support measures accessible to users by applying information to design a portal around goals, tasks and roles that provide a coherent view for the employee user. Third, communication and collaboration tools need to be in place to support the search for appropriate collaborators and solutions.

Wales study on work-based learning

A recent investigation sought to identify the current pedagogic, policy, organisational and sectoral challenges facing the promotion of effective employer engagement in work-based learning that is delivered in partnership with Welsh higher education institutions (Treadwell & Kennard, 2009). The investigation involved both large-sized enterprises as well as SMEs, and was split into three phases: (a) demand analysis, (b) current supply provision and (c) potential infrastructure requirements. The demand analysis was undertaken through a combination of case studies and desk research. The business drivers for interest in work-based learning amongst firms of all sizes were found to be: firstly, rising expectations across all markets; secondly a reduced tolerance of poor performance; and thirdly, statutory requirements for certain respondents. Indeed, as part of this study all the firms interviewed appeared to be undertaking learning in the workplace, although this was primarily informal.

Amidst the themes emerging from this work-based learning study were that SMEs are often isolated from similar enterprises in the same sector of the business world due to competitive rivalry, and often do not gain the critical mass necessary to express demand. As a result, relatively low demand presents itself to universities and this is costly for them to service. Other demand-side issues included cost, time and ability to commit their staff. Few of the SME leaders saw Welsh universities as places to up-skill their key staff or saw the university campus as the key venue for professional development training. Only a few institutions were perceived to be offering their own university space to jointly develop new businesses. The inferences for universities are that they need to demonstrate to businesses, managers and employees that work-based learning and e-learning opportunities offer relevant, accessible and worthwhile solutions that cater to their needs.

In Wales, as elsewhere in the UK (and probably other parts of the world), an existing provider base of public and private trainers and assessors operate government-supported work-based learning at low-to-medium skill levels. This complex pattern of providers includes private companies, local authority training units, specialised further education (FE, i.e., vocational
education) college departments, as well as voluntary and not-for-profit organisations. They vary in size from small specialist providers (10 to 15 staff) that operate within a defined sector and geographical area, to large-scale national or international companies that are multi-sector, cross-region providers employing several hundred staff. There is great competition between providers at this level, although the FE colleges are probably the largest sector (Treadwell & Kennard, 2009). In essence, FE managers have moved with alacrity to ensure that work-based practice is recognised at the Certificate and Foundation Degree levels. The range of application across employment sectors shows some variation, but it has made significant impact where statutory requirements for training exist, such as in the care sector. The FE sector has also strongly supported leamdirect (www.learndirect.co.uk), a government initiative on flexible delivery through technology-supported learning that also has business and commercial applications.

Another clear theme emerging from the study in Wales was that work-based learning support for enterprises involves radical change for a university. It requires shifts in regulations and curriculum, reconfiguration of learning relationships and the introduction of new practices. Fixed curricula do not suffice; indeed, employers prefer ‘shell’ modules within which learning content can be tailored or negotiated. The predominant knowledge source is within the enterprise as opposed to within the academy. Universities, therefore, to optimise their response to SMEs, need an interface that is responsive to client demands, with an adaptive structure to give them the ability to regulate diverse demands and client needs. Furthermore, they must find ways to differentiate themselves from other education and training providers.

The outcomes of this study led the co-ordinators to explore further how technology can enhance the delivery and quality of work-based learning, by using a reflective journal as a part of an e-portfolio approach for the support of second-year undergraduates through employment-based mentors. A major goal is to provide a greater understanding of how the learning content generated can be used as open learning content with good practice exemplars through the support of Joint Information Systems Committee (JISC at www.jisc.ac.uk).

As learning is now closely linked to technology, JISC has been working to find and resource efficient and cost-effective ways of engaging with SMEs that are genuinely mutually beneficial and where the reward matches the effort (see JISC, 2009b). To this end, it is supporting work packages that aim to deliver good practice and publish exemplars for institutions in SME engagement through enhanced processes and innovative technology use. This is intended to enable institutions to engage with businesses more efficiently and effectively, and to fruitfully enhance the institutional offer to SMEs to provide mutual benefit for them and universities in the UK. Three current schemes are particularly relevant. First is a project involving efficient systems for SME engagement (JISC, 2009d), which aims to provide a comprehensive study designed to identify and disseminate best practice in resource-efficient, technology-enabled engagement, drawing on regional models, international examples and brokerage models. Second, a project called e-empowering seeks to develop the institutional offering of advice, guidance and models for SMEs that wish to capitalise on Web technologies and e-commerce. It will analyse and synthesise needs and demands as well as institutional capability, and contribute to the development and sharing of good practice and exemplars. Last but not least is a project called MyPlan, which aims to contribute to the development, deployment and evaluation of new techniques and tools that facilitate personalised planning for lifelong learning.

**E-communication and learning influences**

Work-based and e-learning in firms is not a ‘green field’ site ripe for exploitation by universities, as many providers already exist and vie for influence on managers and decision-makers in small firms. The suite of business influences on an SME manager that affect workforce learning...
can be visualised as arising from four directions of influence, as shown in Figure 1. These groups of influences are:

- **Top-down** on a manager, where the influencers come from the direct business environment. Examples are client responses, competitive strategy as well as the demands of other businesses in the supply chain.

- **Bottom-up** influences from individuals or groups of employees who need the appropriate knowledge to do a job effectively or for career development.

- **Side-on** influences from peer business sources, business networks, trade practice and business support agencies, which include advice and support from technology counsellors and higher education business support officers that provide access to a range of networks. Entrepreneurs in the aforementioned University of Wales, Lampeter study seemed to prefer to acquire knowledge through external advice, networking and the exchange of experiences with other managers, rather than through formal training.

- **Side-on** from community organisations that surround an SME, where there are inter-relationships between the firm and its employees in the exercise of corporate responsibility.

![Figure 1: Four learning influences on an SME entrepreneur model (adapted from Beevers, 2000)]
e-dialogue. Learning and its outcomes and artefacts can then be captured, stored, shared and/or mined. Conversations in business networks can provide information on development opportunities, with e-communications providing greater availability and accessibility to information, knowledge and skills. Even geographically-dispersed organisations can benefit, and this can be particularly helpful to SMEs based in rural or regional areas. The many kinds of informal knowledge transfer that can occur through these channels include but are not limited to:

- instant messaging
- phone calls to someone with information that is needed
- real-time chat (in an Internet or intranet-based chat room)
- Web-based meeting with a real-time agenda
- conversations through a Voice over Internet Protocol (VoIP) application such as Skype (www.skype.com), possibly enhanced by video through the use of Web cameras (webcams)
- online collaboration tools (both synchronous – eg shared whiteboards and collaborative Web browsers – as well as asynchronous – eg file repositories, discussion boards)
- file transfer.

The uses that can be made of these channels are even more diverse and would not be possible to list exhaustively. However, examples of two diverse uses would be a sales presentation meeting introducing a new product and a technician reviewing a repair process.

Most formal learning is based on models that are designed for efficiency. The ultimate goal of learning in the workplace is to boost performance – both individual and organisational. There are many tools for improving performance, and these appear to be most effective when integrated with work activities. What these processes can bring to the SME workplace is speed in the delivery and/or transfer of information. It can also raise the expectation of a speedy response on the part of customers and collaborators. From a business perspective, this ties in with operations and in delivering the business proposition; hence there is a rational argument to shift investment into performance support tools. The issue that can arise is largely a matter of terminology. The term ‘social network activity’ falls close to a leisure activity in the perception of some SME managers. It can be more persuasive to express this as ‘e-communications’ to such managers, with the business aim of becoming a smarter and nimbler enterprise.

A network of professionals/technologists who engage in e-communications to work together for collective benefits is often called a community of practice (CoP) (Wenger, 1998). A CoP is an environment, usually for people with a common interest, to communicate, learn and build knowledge needed to solve problems and accomplish work. CoPs are most successful and effective where they involve sharing experience through interacting with other partners, as well as learning from one another. A network’s strength in a particular service area depends on how actively its partners exchange information with one another, reciprocate in organised or informal forums, or receive news bulletins and invitations to events of interest on topics relevant to a field of business. As a result, CoPs create knowledge as much as they transfer it, and they foster informal learning focused on specific problem areas. The key benefit of networking is sharing new ideas and learning from the experiences of other businesses. The content that is shared depends on both the kind of business and the type of networking. For a start-up or small business, networking can provide a lifeline of support and assistance in gathering new leads. Networks can also be a key source of information and support, supplying avenues to discuss issues of common interest and/or concern (eg legal and regulatory developments), as well as to develop and share ideas, innovation and knowledge of best practice. Notwithstanding the benefits, involvement with online collaboration can have a downside with SME staff if team roles are not taken into account, as such activities can impose additional stress on an employee (Allan & Lawless, 2005).
A cost-effective means of fostering communication with peers is to install a social media infrastructure, such as Ning (www.ning.com), which requires no technical skill to build an online community. Even if the organisation is not geographically distributed, there are benefits to technology enablement. A new generation of employees is emerging who are immersed in social networking Web sites such as Facebook (www.facebook.com) and MySpace (www.myspace.com). These social network services, in general, focus on building online communities of people who share interests and activities, and who explore one another’s activities. There are potential consequences of this social phenomenon – when these employees casually post accounts of their lives for their friends and the world to see, there are accompanying issues of security. Few social network users realise that posting social information, when combined with new technologies for gathering and compiling data, can create a distinctive pattern of behaviour. This information provides opportunities not only for legitimate business purposes, but also for e-crime through identity theft and other predations. For this reason, JISC (2009a) is supporting a project called Institutional facilitation and establishment of Warning, Advice and Reporting Points (WARPs) for SMEs, which aims to establish CoPs focused on institution-SME ICT security. WARPs, which have been used successfully in local government, are a model created and promoted by the UK Government’s Centre for the Protection of National Infrastructure (CPNI) to build communities that can receive information about ICT security relevant to their particular needs and, in time, develop sufficient mutual trust to become self-supporting by sharing their own knowledge of ICT security problems and solutions (for more information, see www.warp.gov.uk).

E-learning 2.0 refers to new ways of thinking about e-learning, which is built around collaboration and social networking. E-learning 2.0 is not simply a set of applications such as wikis, blogs, mash-ups and so on – it is about users adopting practices that leverage these applications to support work and learning in new and powerful ways. Two examples have emerged from a government initiative intended to support a number of university actions that contribute to the economic recovery of businesses (UUK, 2008).

The first example is called ProfitNet and is based at the University of Brighton (www.brighton.ac.uk/profitnet). It provides practical support to help SMEs identify problems early. The scheme offers practical and hands-on advice for start-ups and established businesses, through monthly sessions targeted at specific business sectors. It has attracted 500 companies across Sussex, and helped in the creation of supply chains, the development of new processes and the exploration of joint venture opportunities. ProfitNet works by creating facilitated ‘learning networks’, whereby groups of 15 to 20 businesses meet on a regular basis for knowledge exchange and sharing of best practice in business planning, strategy and innovation. These are excellent examples of successful communities of interest.

A second example is the Kingston University Business Interaction with SMEs (Kubis) initiative (www.kubis.org.uk). Here, a foundation degree in Business Process Development is aimed at employees working in SMEs. The course is designed for people with valuable work experience but who lack formal qualifications. The foundation degree addresses the specific business objectives of the company and the professional development needs of the employee. It develops broad understanding of business processes, business knowledge, concepts and techniques, as well as building critical awareness of current issues. The program is a practical, online, interactive, work-based learning course. Work-related student projects are supported by a custom built social networking environment, KubiSpace, which uses Web-based tools such as forums, chat, blogs and wikis to share ideas and bring knowledge from relevant professional communities back into a business. Employees have a personalised online portfolio within which to create work, modify its contents and share it with others. KubiSpace also brings work mentors, university tutors and other contacts together online. Up to 70% of the course can be completed by independent work-based projects. The scheme provides evidence that formal learning is changing. The integration of collaborative tools is creating new, blended models for providing structured support for e-learning, taking it from an e-learning 1.0 model to e-learning 2.0, and the value and importance of learning in the workplace is gaining more recognition.
Sustainable provision

Making such learning provision sustainable, in the sense that it is able to develop, survive and be affordable for small firms, is a continuing issue for providers and e-learning managers alike. It appears that almost every UK university initiative for SMEs has the support of central government. This is acknowledgement that as a client group, SMEs merit special support from public sources. In the university, the university-business interface with SMEs is typically managed by an industrial liaison office concerned with a broad range of knowledge transfer matters, rather than a mainstream academic department whose focus is on research, teaching and learning. This ‘fuzziness’ of interaction can give rise to an underestimation of costs. The direct costs, overheads and capital employed can make the full economic cost of delivering work-based learning comparatively expensive. The addition of e-learning support can provide certain efficiencies, but on the other hand may also add another layer of delivery and resource costs. Curriculum development and validation arrangements can further escalate the cost of formal learning.

In higher education, academic staff are responsible for designing new courses, which undergo a rigorous process of academic validation before they are accepted as leading to academic award. The curriculum life cycle has become much shorter, with courses being revised and new courses validated at a much faster rate than in the past. The speeding up of the curriculum development process has been in response to a number of factors: employer demands, rapid developments in science and technology, the development of many professions and some sectors of economic life. Moreover, there have been increasing expectations from government, employers and students that a university degree will provide the most up-to-date knowledge and understanding in any particular discipline. Changes in the curriculum and in the assessment of student learning have also been essential to respond to the much larger, more diverse student population. The result is that the cost of curriculum development has become much higher as a consequence of the increased pace of renewal of courses and materials, and the greater resource-intensiveness of quality assurance and validation processes now required (UUK, 2009).

The search for sustainable university provision to SMEs has not seemingly yielded a ‘killer application’ thus far. One avenue for exploring sustainable solutions at the author’s university, the University of Wales, Lampeter, has been the development of online tools such as online dictionary and grammar that are supported by EPSS’s and by credit-based modules. The tools themselves are very successful in drawing users – typically a quarter-of-million hits a month in total for every category of user. Converting the SME user to progress to complete assessment tasks for academic credit, however, has required personal intervention, encouragement and support rather than relying solely on employee motivation.

The university model for program delivery is based on mass education and this model is supported by established quality assurance procedures. How can this system be adapted for optimising learning in SMEs? Chunking learning programs up into small elements is one strategy that has been adopted by providers. In the UK, learndirect adopts a ‘bite size’ approach to learning by breaking learning content down into small packages, conveyed by ICT, and in addition offers credit assessment. Another approach can be seen at the Association of Chartered Certified Accountants (ACCA at www.accaglobal.com), where continuing professional development (CPD) programs are offered to members to enable them to earn credit points required for retaining their professional accreditation. ACCA members read articles and respond to questions by mobile phone or via the Internet; their responses are automatically assessed and the appropriate CPD points applied to the member’s records.

A new approach to a labour-intensive bottleneck in work-based learning is taken by a JISC-supported project led by the University of Derby, the e-Accreditation of Prior Experiential Learning (e-APeL) project (see www.derby.ac.uk/e-apel and JISC, 2009c). The process of
Accreditation of Prior Experiential Learning (APEL, variously referred to in different countries as Recognition of Prior Learning [RPL], Assessment of Prior Learning [APL], Recognition of Current Competency [RCC] and Prior Learning Assessment and Recognition [PLAR]) is an intensive, expensive and difficult one, both for employees and the academic staff who operate it. The e-APEL project hopes to enhance the efficiency and effectiveness of APEL by developing online services that use e-assessment technology to allow potential students to self-assess their prior experiential learning and receive an indication of the credit they might be able to claim. The system will also gather information from potential students so as to enable a well-informed discussion to take place with an APEL academic advisor, and to guide applicants in the compilation of their APEL claim using an e-portfolio facility based on PebblePad (www.pebblelearning.co.uk).

**Measures of e-learning success**

Decision makers in SMEs appear to prefer on-the-job training and informal learning, where there is a direct link between cost and benefit (Lange, Ottens & Taylor, 2000). In spite of this, it is argued by Hardaker, Dockery and Sabki (2007) that many employees and managers in small and micro firms are being excluded from e-learning provision because of pedagogic inequity and the lack of learning styles support in work-based learning practice. For a company, the process of engaging in a work-based e-learning program demands time, effort and resources. With such effort expended, it makes sense for managers in the firm to monitor the results to justify the initial investment. Evaluation as a process can produce evidence that can assist with decisions that enhance the quality and perceived value of e-learning. Hence, a clear rationale is needed that directly connects to the aims of and challenges faced by business owners and managers.

Evaluation is an activity that professionals engage in constantly, comparing the actual and real, with the predicted or promised (Geis & Smith, 1992). The reason for doing this is to determine the effectiveness, efficiency and/or appropriateness of a particular course of action. The intention is to highlight good or bad practice, detect errors and correct mistakes, assess risk, enable optimum investment to be achieved and also allow individuals and organisations to learn. The outcomes of the evaluation process can tell people what they have done wrong or that they are about to fail. The problem is that no evaluation tool possesses the qualities that make it applicable to every situation.

Early e-learning development efforts tended to focus on using the Internet to deliver an instructional program within which content was designed to guide the learner through a pre-planned or pre-determined learning sequence. Classic evaluation techniques can be easily applied to determine and measure the success of such formulaic e-learning. With e-learning 2.0 built around collaboration, however, there is a presumption that knowledge is socially constructed through conversations and other interpersonal interactions concerning problems and solutions; this presents a different challenge for evaluators.

A small number of classic evaluation models are widely used by training and development (T&D) practitioners. The most common is the Kirkpatrick (1994) model, which defines a specific emphasis for each of four levels. Other structured, level-based approaches exist, for example one based on performance analysis (Brinkerhoff, 1987), and another that contains a fifth level used for translating the worth of training into monetary value (Phillips, 1991). These methods all share a common focus at their highest levels on determining and expressing the worth of training at an overall business level. It has always been recognised that it is difficult to isolate and measure the results of training in order to identify a causal link between one or more given training interventions and performance improvement. The long-established Kirkpatrick model is still the blueprint for evaluation by many T&D professionals, even though the return on investment (ROI) assessment at Level 4 is seldom achieved due to the difficulties in identifying causal links and because of the sheer cost of conducting ROI evaluations, which can exceed the cost of the training itself.
For firms, the success of an e-learning program is tied to the ability of the program to meet the learning needs of the organisation. A primary reason for providing education and training for managers and employees is to address a gap between existing knowledge/skills and the level of knowledge/skills necessary for current or future work functions. Evaluation is therefore a core step in the instructional process as it entails measuring the extent to which participants have satisfied the program’s objectives in acquiring the required knowledge/skills and bridging the identified performance gap(s). It also provides a means of demonstrating to managers the business value of a learning program.

A key aspect of evaluation in terms of business impact involves consideration of ROI. The returns for the SME can be both financial and non-financial; non-financial benefits can be manifested, for instance, through the acquisition of critical skills, problem solving or customer satisfaction. The investment in an e-learning program includes not only the costs and fees of developing and delivering the program, but also the direct employee time costs, overhead costs, capital investment costs and opportunity costs that arise from undertaking the program. For employee development to be positively regarded by an SME manager, a clear link with business performance and relevant indicators, such as motivation and staff turnover, must be made. As noted earlier, there are certain limitations in applying a classic evaluation approach to e-learning. The essence of the application of e-learning is speed, and by the time a detailed set of behavioural objectives has been specified, the business problem may have changed. In the process of perfecting a training/instructional or learning design a business opportunity might be missed. Difficulties can also arise from establishing a causal link between business performance and e-training. The problem, then, is not that the instructional model is poor, but rather that its limitations are not always fully acknowledged.

The question arises whether there are alternative ways of measuring e-learning success, especially considering the advent of e-learning 2.0, in which participants tend to be more fluid and personalised in their approach. The shift of emphasis to performance tools and e-communications appears to move the onus onto the SME manager to collect evidence of learning and transfer, for example, through direct observation and explicitly enquiring of employees how they performed a work task or obtained a given result. This is likely to come from an assessment of work performance, since the learning is likely to be embedded in a work process. This can emerge from operational questions such as, “How did you achieve this [ie a particular] output?” It could also arise from the application of a form of democratic dialogue that has been trialled in two public sector organisations (Kalliola, Nakari & Pesonen, 2006). The SME manager should consider this assessment as contributing to the broader evaluation of the financial return for investment by the firm. However, there is also a need for caution by the manager, since the speedy appearance of a report or appraisal from an employee may not necessarily indicate greater effectiveness or enhanced learning, but simply easier access to and replication of other people’s work. Nevertheless, the work of Dealtry (2008) suggests that regardless of the size of the firm in question, “to be successful in this turbulent era of intensive new learning management, there needs to be continuous commitment to engendering innovation diffusion in both strategic and tactically inspired new learning process management” (p. 71). In addition, according to him, there is also a need for serious reflection about the creative nature of learning leadership and also the application of relevant management styles.

**Policy options**

Work-based e-learning can be further developed with supportive policies that are relevant, effective and transferable, and that can help support, albeit indirectly, the optimisation of work-based learning and e-learning in SMEs. A recent forum for European networks in the field of innovation and ICT applied to education and training (Learnovation, 2009) contributed to the debate on lifelong learning and the applications of ICT for European education beyond
2010. It concluded by identifying ten imperatives, the majority of which are directly relevant to the subject of the present article. The recommendations proposed included the following:

- **Rescue research on education and lifelong learning from a marginal position.**
  Education and lifelong learning research needs a refreshed agenda to influence learning systems and their governance models.

- **Provide more evidence to policy marking, but choose indicators that are able to push creativity and innovation, not only conformance.**
  Developing indicators and benchmarks for policy makers is an important step, but more attention should be placed on innovative processes.

- **Bring informal learning into the policy spectrum.**
  Lifelong learning for all citizens can be accelerated due to new ways of ICT-supported and socially-networked informal learning; policies should recognise this potential and be supportive of its achievement.

- **Encourage all forms of learning at the workplace, since working and learning tend to overlap.**
  In a knowledge-based enterprise, the boundaries between working and learning are often blurred, but the development of a climate that is supportive of and conducive to open ways of learning should be encouraged in all organisational contexts.

- **Help teachers and trainers recognise and respect the value of informal learning.**
  Trainers and teachers should be supported in using the potential of informal learning to complement and enrich institutional teaching and learning processes, and in recommending to learners ways to learn autonomously.

- **Not all workers are stereotypical knowledge workers.**
  Those who do not fit the mould of the ‘knowledge worker’ should not be forgotten when optimistic positions are expressed on the potential of new (eg Web 2.0-based) forms and modalities of learning.

**Conclusions: contemporary research issues**

This article has considered various practical and theoretical issues relating to the application of e-learning to the optimisation of work-based learning in SMEs. Formal e-learning is changing and seeing the integration of new tools for collaboration. However, learning in the workplace often does not recognise performance support tools or the role of e-communications in SMEs. The experience of undertaking work-based e-learning appears to be dependent on and reflect the budget, the audience, the geographical coverage, the availability of trainees’ time, the shelf life of the e-learning solution, the product cycle and the nature of professional collaboration. In concluding, therefore, it is fitting to outline a number of current and future research and development questions that need to be answered, while at the same time recognising the considerable impact that new learning technologies are making on the work-based learning area.

**Costs and benefits**

What is the full economic cost of employing e-learning to support work-based learning in SMEs? How can technology and management processes be best adapted to provide effective support for employees and managers? Can the resource equation for university delivery be balanced through models that integrate learning into work processes, or will there be a continuing need for external support, virement or subsidy? Are there other benefits to be gained by the university from their interactions and dealings with SMEs, for example in terms of curriculum development/renewal, knowledge transfer, graduate employability, lifelong learning practice and entrepreneurship, and if so, how should these benefits be assessed?
Examples

Are there effective and accessible exemplars of ‘good practice’ and ‘best practice’ in work-based e-learning? How can these be leveraged to promote to SMEs effective practice for optimising learning? What are the most effective ways of raising awareness and interest? Do co-operative organisations provide answers, or are supply chain approaches superior?

Learning models

The traditional university model for program delivery is based on education for the masses, and this model is supported by established quality assurance procedures. How can this be adapted to appropriately recognise the value of informal learning? What are the best approaches and methods for integrating learning into work processes, and for conducting learner assessments? Are there cost-effective ways of helping to optimise learning in SMEs through the application of technology? Are university structures suitably organised or optimised to support SMEs? Do programs of study based on content defined by enterprises and/or based on ‘shell’ credit modules present a viable solution?

Pedagogy

With the rapid development of technology-based networking applications, pedagogy lags and is less well considered. A generation of free-agent learners has emerged who access the Internet and technology-enabled resources, and who possess an ability to determine what, when, with whom and how they want to learn. These individuals are not simply autodidacts as self-learners, but autogogics in the sense that they are self-determining their curriculum and leading the learning processes. How can pedagogic requirements shape the technological decisions and presentation of e-learning for the workplace? How should we go about developing and promoting wider pedagogies, such as andragogy, autodidaxy and collaborative learning?

Communities

The advent of networked approaches, multimedia programs and Web site delivery has aided the observability of the learning product. Many ‘observers’ will not convert into ‘customers’ by registering as students, but how are their experiences or motivations ‘captured’? Can peer engagement through CoPs, aided by electronic networks of professionals, help in the identification and development of new approaches to peer learning? How can practice be developed flexibly through Web services?

Evaluation

How can fairness, consistency and balance in the evaluation of work-based e-learning and its resulting benefits to the enterprise be promoted, given the need for professional judgements to be made swiftly, simply and on soft outputs?

Policy

What are the effective and transferable policy options pertaining to work-based e-learning that are available? Would a shift of support to stimulate demand from SMEs (such as in introducing innovation voucher schemes), rather than subsidising the supply-side, improve adoption? Will the promotion of workplace learning partnerships encourage the development and growth of CoPs? Should the focus of policy support be on specialist program providers, or on program delivery?
References


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