

PANORAMA

The challenge of e-learning in small enterprises

Issues for policy and practice in Europe

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in small enterprises
Issues for policy and practice in Europe

Graham Attwell

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Foreword

Small and medium sized enterprises (SMEs) play a central role in the European Union; they account for over 99 % of all businesses and provide employment for more than 74 million people. SMEs are the main source of jobs and a key driver for innovation, employment and social integration. The coming enlargement of the EU will further increase their importance.

The transition to the knowledge economy, globalisation, and omnipresence of information and communication technologies (ICT) require a permanent updating of the skills and competences of our workforce. The effective implementation of lifelong learning throughout Europe is a main requirement in this context, a particularly challenging task for SMEs.

E-learning, through the flexibility and facility of access it offers, is seen as an important enabler of lifelong learning. However, whereas we can observe an increased use and impact of e-learning in large companies (up to 60 % of the training needs of key players in the ICT sector is now provided by e-learning) the uptake of e-learning in SMEs is very slow and does not meet initial hopes and expectations.

Therefore, it is crucial to get a better understanding of the key issues related to the development and use of e-learning in SMEs.

This report is a first step in this direction; it is the result of a small research project that has been conducted by members of the Cedra ICT research network (CiRN) on behalf of Cedefop and the European Commission.

The objectives of the project were to undertake a series of case studies and a summary study on the development and use of e-learning in SMEs in different countries and to identify good practices and issues in the development and implementation of models for the use of e-learning.

Given the limited size of the project, the results are surprisingly rich. The report identifies a number of important issues in relation to the use of e-learning in SMEs, including: a missing training culture in SMEs; 'e-learning divide' between white and blue-collar workers; poor content; linguistic issues; costs; and missing support structures.

In addition, the report points to several interesting options in addressing the identified issues and supporting the development and use of e-learning in SMEs. These include possible changes in work organisation; the use of e-learning to support informal learning; development of effective pedagogies and strategies for e-learning in SMEs; and the important role of regions, networks and partnerships.

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Preface

There has been much talk about the potential of e-learning in addressing the learning needs of enterprises – in particular small and medium sized enterprises. But, firstly the issue of devising the most effective way to implement e-learning strategies in small enterprises has to be addressed. This is a question both for public authorities and private small enterprises.

Basically there are two ways in which e-learning resources can be used in small enterprises. The first way is to provide ready-made training programmes as stand-alone e-learning solutions for those working in SMEs – this is to view learning as a formal structured activity. The second way is to provide effective information and communication tools (e-learning resources) that support workers' everyday efforts to devise better ways to do their collective work and to improve their levels of knowledge and competence. The second approach views learning as an interactive informal but at the same time substantial activity that is embedded in everyday work processes.

This small study looked at the emerging practice of the use of e-learning resources in SMEs in a number of European countries. It concludes that the potential of e-learning, seen either as a formal structured activity or as supporting informal learning, can only be exploited if in the first place, learning is aligned with the business needs of the enterprise and is supported by an appropriate working and learning environment. When the search for information and know-how is seen as business-related while at the same time offers employees the possibility of personal and career development, then the proper conditions for learning at work are in place. These conditions are a prerequisite for the effective utilisation of e-learning resources.

This report also raises the question of the need for regional or umbrella agencies – both public and private – to support small enterprises in their e-learning activities. This is best done if an umbrella agency assists companies to work on business, technological development and learning issues in an integrated way. The establishment of networks of SMEs on a local basis can also be a way for SMEs to learn from each other in an informal and pragmatic way about best practices in e-learning.

This report, which is based on a joint project of the European Commission and Cedefop in the context of the Cedefop research arena (Cedra), cannot be seen as more than taking a tiny step in tackling the issue of e-learning in SMEs. However, the small network assembled to undertake this task has provided us with a valuable service in identifying key points that need to be placed on the agenda for future work in this important area.

Stavros Stavrou

Deputy Director

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Project Manager

Executive summary

This report presents the results of a small research project, jointly undertaken by Cedefop and the European Commission DG Education and Culture, to identify key issues related to the use of e-learning in small and medium sized enterprises (SMEs). The report draws on the results of case studies in Austria, Italy, Poland, Spain, and the UK.

One of the conclusions of the report is that for the effective utilisation of e-learning solutions in SMEs an underlying learning culture and infrastructure needs to be in place. In this regard the role of managers of SMEs in implementing e-learning in a coherent way, is a key factor. While a number of technological issues such as access to bandwidth emerge in most of the country case-studies, it is pointed out that the provision of bandwidth on its own does not address the issue. Bandwidth without suitable and appropriate learning materials is not of much use. Even with suitable learning materials, unless the business organisation supports the integration of e-learning, take-up will be limited.

One of the reasons for the slow up-take of e-learning is that the present definition of e-learning is too narrow. In fact, e-learning in SMEs may be most powerful when it is integrated in company business processes through networks and systems for commerce and business development. The tools or software systems used in learning will often (or usually) not be dedicated e-learning platforms but everyday business systems and software. Many workers in SMEs use e-mail every day as part of their work to exchange information about work processes. In this way, e-mail may be the most prevalent learning tool for sharing information within the workplace, leading to knowledge creation. Many workers, especially those involved in skilled technical work, use Internet search engines and discussion groups to access technical information and for problem solving. The learning materials of the future in SMEs may not be bought in or prepared by e-learning specialists, software houses or multimedia publishers, but may be the products of employees' documented and shared enquiry into their own practice. Thus, the idea of e-resources in place of e-learning materials in representing far wider applications of learning in the workplace, is put forward.

Learning infrastructures are not just about computers and networks. Learning infrastructures include the ability to assess training needs, to respond to those needs and to develop training plans and strategies for human resource development. There is little evidence, apart from isolated knowledge-rich companies, to suggest that SMEs are able to provide this kind of infrastructure. Providing access to advanced technologies for e-learning without a basic learning infrastructure will not work. In the short term it seems unrealistic to expect that SMEs will develop the necessary learning cultures and accompanying infrastructures. These responsibilities will have to be assumed by networks or regional or sectoral bodies which can bring a wider perspective on learning and greater expertise than exists in most SMEs. At present where networks or regional bodies are undertaking this role, expertise in education and learning tends to be separated from expertise in the provision of computer based

infrastructures. These different kind of expertise must be brought together to unlock the potential of e-learning for SMEs.

E-learning cannot be merely tacked on to training cultures characterised by poor organisation and planning. That SMEs lack a quality training culture has been a matter of policy concern for some time. E-learning has been seen as a way of overcoming this lack of training. This is based on the premise that the major barriers to training in SMEs are the lack of time to release employees for conventional continuing training courses and the cost of training provision. Whilst this may be true, the use of e-learning, by itself, does not overcome these problems. Managers may be prepared to sign up to the idea of e-learning in the workplace, but the case-studies suggest that they are not reducing employees' workload or putting aside realistic time for employees to engage in learning activities. E-learning at work, said one employee, means learning in your own time outside the workplace. Neither is there significant evidence that the cost of e-learning is substantially less than more traditional methods of learning.

There was also evidence to suggest that where e-learning was taking place, it was generally limited to white collar, technical and professional employees and, in particular, to those using new technologies in the workplace. This finding is extremely problematic. The introduction of e-learning has been associated with the move towards lifelong learning and to a more inclusive approach to widening participation in continuing learning. But we found e-learning was almost exclusively the preserve of those groups who are already participating in continuing professional development programmes either at the request of the company or on their own private initiatives.

A final point concerning the general lack of learning culture within SMEs relates to the pedagogies of e-learning. Educational institutions, and especially larger companies and e-learning providers, have recently adopted the phrase 'blended learning'. This means that e-learning needs to be supported by face-to-face activities and requires moderation by tutors and trainers within planned and coherent learning programmes. This is a fundamental issue for SMEs.

1. Introduction

This report outlines the results of a small research project, jointly undertaken by Cedefop and the European Commission DG Education and Culture, to identify key issues related to the use of e-learning to promote learning objectives in small and medium sized enterprises (SMEs).

The objectives of the project were:

- (a) to undertake a series of case studies on the development and use of e-learning to support learning in small enterprises in different countries;
- (b) to identify good practices and issues in the development and implementation of models for the use of e-learning to support learning in small enterprises.

Case studies, in Austria, Italy, Poland, Spain, and the UK, contributed to this synthesis report. The case study findings are summarised in Annex 1.

The issues explored in the case studies included:

- (a) models of learning and knowledge development in small enterprises;
- (b) problems and barriers in the use of e-learning in small enterprises;
- (c) support for learning and partnerships for e-learning applications in small enterprises.

We do not pretend, neither did we set out, to have definitive answers to the issues raised. What we aimed to produce is an extended agenda for further development by researchers, policy makers and planners.

Despite the limited size of the studies, the wealth of findings is surprisingly rich. Yet it is hard to find clear patterns from the case studies and observations. What perhaps emerges most clearly is a somewhat chaotic picture. This could be ascribed to the limited sample size. However, our hypothesis is that this is a true picture of the state of the use of ICT for learning in SMEs in Europe and will be replicated by larger scale studies. The reason for such a chaotic picture lies in the failure of any organised, planned or coherent take up of e-learning by SMEs. Many SMEs lack a basic learning culture or organised training plans and infrastructure. The individual motivation of managers emerges as one of the major factors driving the adoption or otherwise of e-learning. A number of issues recur in most of the case studies. Access to bandwidth may be a barrier but provision of bandwidth on its own fails to address the problem. Bandwidth without suitable and appropriate learning materials is fairly useless. Even with suitable learning materials, unless the business organisation supports the integration of e-learning, take-up will be limited.

2. E-learning in small and medium sized enterprises

2.1. Digital technologies and the challenge of lifelong learning

Digital technologies have been a major driving force behind the profound changes in work organisation, production and society over the last twenty years. These changes have led to what economists characterise as the knowledge-based economy in which the knowledge held by individuals and organisations is critical to innovation and economic and social development. Whilst initial education and training were previously seen as providing the basic skills and knowledge required for work and for participation within society, the new social and work forms require continuous updating of personal and collective skills and knowledge – in other words, lifelong learning.

Lundvall and Borrás argue that the ‘learning economy’ is a more appropriate term than the ‘knowledge-based economy’ in articulating today’s agenda where specialised and codified knowledge has a very short life-span. Hence, it is the capability to learn how to create new knowledge and adapt to changing conditions that will increasingly determine the performance of individuals, firms, regions and countries (Lundvall and Borrás, 1997, p. 31).

Just as digital technologies have been a key force in driving economic and social demand for new knowledge, they have also been hailed as a potential means for developing a lifelong learning infrastructure. E-learning, the application of information and communication technologies to curriculum and pedagogy, has been seen as providing universal access to information and providing a new, flexible and ubiquitous learning environment open to all.

Despite spawning a whole new industry, not to say numerous government and European sponsored initiatives and programmes, the reality has been less than convincing. The development of e-learning has been dominated by the metaphors of the virtual classroom and the virtual university – an obsession with technologies and a focus on distance applications – rather than the diffusion of learning in wider societal activities and forms. The term e-learning has become devalued to the extent where it might be more properly seen as a marketing word rather than a description of pedagogic and learning practices. There has been very limited attention to vocational and occupational learning and the development of e-learning environments in less formal learning contexts. Research suggests that most learning – for good or for bad – takes place in everyday life and work social situations (Nyhan et al., 2003). In other words, most of our learning is informal learning taking place in a variety of social contexts. Furthermore, anecdotal observations lead to a belief that e-learning may be at its most powerful in less formal and more situated learning environments.

Work carried out in various social settings, and particularly in small and large organisations plays a very important part in people’s lives. Therefore, learning from an economic, human

and social point of view has to be embedded in the fabric of all work organisations. If e-learning is to make a contribution to changing the learning paradigm, it must be embedded in the work organisation. Many major companies have initiated programmes and environments for e-learning for continuous vocational training and to a lesser extent to support initial vocational education and training. However, e-learning has, until now, had limited application in small enterprises. It has tended to focus on providing networked access to virtual classroom type environments or to distance learning supported by computer based materials. At policy level European programmes and national programmes such as Go Digital have emphasised the importance of the Internet and of digital technologies for e-commerce and for business-to-business (B2B) applications but have paid only limited attention to the use of ICT for learning. What little research there is, points to very limited uptake of e-learning by SMEs.

2.2. What is an SME?

Our research project has raised fundamental problems in defining SMEs and e-learning. The original question of what constitutes an SME derives from the very broad definition of an SME in European policy terms. The needs of SMEs depend on a number of different factors of which one of the most important is size. The capacity for building the infrastructure and the capability to develop an appropriate learning culture to support e-learning is very different in micro enterprises (<10 employees) from larger SMEs. Similarly, there are differences between enterprises of around 50–100 employees and enterprises between 100 and 250 employees ⁽¹⁾. There are big differences in infrastructure, management structures, work systems and attitudes between larger SMEs and smaller SMEs let alone micro companies. In a country such as Greece nearly every enterprise can formally be classified as an SME. In this study we have tended to follow a rule of thumb, adopting a rather more restricted view of SMEs as companies with less than 100 employees. It is worth noting that in the high technologies sector and in knowledge rich companies the trend is towards smaller companies. Future research projects will need to differentiate SMEs in terms of size, organisation and structure. Policy frameworks and measures also need to take these factors into account. However, a more coherent framework for research and policy may be provided by not treating SMEs as individual entities in themselves, but by looking at the networks and broader structures – supply chains, clusters – in which they participate. The final section of this report provides a brief overview of research into the development of the learning region and innovation and learning networks. If research and policy development for e-learning in SMEs is viewed in this context then some of the problems in SMEs can be overcome.

(1) Officially a micro enterprise has less than 10 employees, a small enterprise from 10-49, and medium sized enterprises from 50-250 employees.

2.3. What is e-learning in SMEs?

The question of what comprises e-learning is even more troublesome. E-learning has tended to be seen as the use of digital media including CD-ROMs, the World Wide Web and intranets, for the delivery of structured e-learning materials and interaction. This definition is problematic.

A number of the SMEs that we studied made extensive use of digital media for accessing technical manuals and for web searches. We would challenge whether the use of ICT for information storage and retrieval necessarily constitutes learning. We would contend that for learning to take place, information has to be applied in such a way as to develop new mental models and schemas, be they tacit or explicit. For knowledge development to take place these new mental models have to be made explicit and shared. There are no doubts that CD-ROMs and the web are useful and convenient ways of storing and retrieving information but unless that information is transformed through use it cannot be seen neither as learning nor knowledge development.

From a converse point of view we find the present definition of e-learning is too narrow. We believe e-learning in SMEs may be most powerful when it is integrated in company business processes through networks and systems for commerce and business development. The tools or software systems used in learning will often (or usually) not be dedicated e-learning platforms but everyday business systems and software. Many workers in SMEs use e-mail every day as part of their work to exchange information about work processes with each other. In this way, e-mail may be the most prevalent learning tool for sharing information within the workplace, leading to knowledge creation. Many workers, especially those involved in skilled technical work, use Internet search engines and discussion groups to access technical information and for problem solving. The learning materials of the future in SMEs may not be bought in or prepared by e-learning specialists, software houses or multimedia publishers, but may be the products of employees' documented and shared enquiry into their own practice. David Guile (2002) has focused on the idea of e-resources in place of e-learning materials in order to represent the far wider applications of learning in the workplace. This idea will be further explored in this report.

3. Developing and supporting learning and learning cultures in SMEs

3.1. Support for managers

The attitude of individual managers emerged as the single most decisive factor in influencing the development of ICT for learning in SMEs, yet there seemed little support for individual SME managers or for SMEs in introducing e-learning. A number of the companies were using e-learning because of their role in supply chains. In Italy, regional organisations were trying to stimulate the use of e-learning. In the UK, the local government in Birmingham was promoting e-learning through an EU financed ADAPT project, whilst in the Tyrol in Austria, the Chamber of Trade has some involvement in promoting the use of ICT for learning. However, in each case the support available was quite limited. There was no natural point to which managers could turn for support, neither did the use of e-learning appear to be a major issue for the different support agencies and networks in which the SMEs were involved.

Learning infrastructures are not just about computers and networks. Learning infrastructures include the ability to assess training needs and to respond to those needs, to develop training plans and strategies for human resource development. There is little evidence, apart from isolated knowledge-rich companies, to suggest that SMEs are able to provide this kind of infrastructure. Providing access to advanced technologies for e-learning without a basic learning infrastructure will not work. In the short term it seems unrealistic to expect that SMEs will develop the necessary learning cultures and accompanying infrastructures. These responsibilities will have to be assumed by networks or regional or sectoral bodies which can bring a wider perspective on learning and greater expertise than is present in most SMEs. At present where networks or regional bodies are undertaking this role, expertise in education and training or learning tends to be separated from expertise in the provision of computer based infrastructures (and often again is separate from expertise in e-learning). These different kind of expertise must be brought together to unlock the potential of e-learning for SMEs.

3.2. Learning and training cultures

E-learning cannot be merely tacked on to existing training cultures, organisation and planning. That SMEs lack a training culture has been a matter of policy concern for some time. E-learning has been seen as a way of overcoming this lack of training and introducing lifelong learning for employees in small and medium enterprises. This is based on the premise that the major barriers to training in SMEs are the lack of time to release employees for conventional continuing training courses and the cost of training provision. Whilst this may be true, the use of e-learning, by itself, does not overcome these problems. At least when

employees travel outside the workplace to attend training courses they are released from the day-to-day pressures of work. Managers may be prepared to sign up to the idea of e-learning in the workplace, but our survey suggests they are not reducing employee workload or putting aside realistic time for employees to engage in learning activities. E-learning at work, said one employee, means learning in your own time. Neither is there significant evidence that the cost of e-learning is substantially less than more traditional methods of learning.

There was also evidence to suggest that where e-learning was taking place, it was generally limited to white collar and technical and professional employees and, in particular, to those using new technologies in the workplace. This finding is extremely problematic. The introduction of e-learning has been associated with the move towards lifelong learning and to a more inclusive approach to widening participation in continuing learning. But we found e-learning was almost exclusively the preserve of those groups who are already participating in continuing professional development.

The issue of supply and demand has resonance for involving wider groups in e-learning. The production of e-learning materials is largely dominated by the private sector. An examination of e-learning programmes on offer in Italy showed most were targeted at managers and technicians. The production of e-learning materials is an expensive and often risky, economic undertaking. It may well be that private sector material developers are unwilling to risk developing programmes for groups with little culture or tradition of workplace learning. Without such a culture there is no evidence that e-learning materials geared towards blue-collar workers would stimulate lifelong learning and continuing training. This points to the need for a strategic policy approach to the development of e-learning in the workplace.

One further implication of the general lack of a learning culture relates to the pedagogies of e-learning. Educational institutions, and especially larger companies and e-learning providers, have recently adopted the phrase 'blended learning'. This accepts that e-learning needs to be supported by face to face activities and requires moderation by tutors and trainers within structured learning programmes. Without a learning culture and without learning plans there is little chance of this happening within individual SMEs.

3.3. E-learning and organisational development

The picture is not one of uniform gloom. Obviously SMEs are going to need collaborative support networks if they are to implement e-learning in the workplace. We believe that the ideas and developments around the learning region may offer potential. At individual SME level, the Birmingham case study is particularly interesting. This study suggested a wider definition of e-learning than has traditionally been put forward. E-learning could be most effective where it is integrated with e-commerce and with the use of digital media, computers and networks within work organisations and structures. Enterprises, even including smaller SMEs, are increasingly using computers and software systems as part of their business organisation for a range of different tasks and processes, including the procurement of

materials, logistic organisation, sales and marketing and process control. If e-learning is integrated into these activities then it becomes part of the culture of an enterprise. Such a perspective breaks down the divide between what has tended to be seen as e-learning and what has been categorised as 'knowledge management' or 'management development'. Pedagogically it integrates the acquisition and practice of skills and knowledge with work processes, developing what some researchers have referred to as work process knowledge (Boreham et al., 2002; Fischer, 1996, 2000). It means that there needs to be a reexamination of what is considered e-learning materials. This may have quite profound implications for software platform providers. It is also dependent of the reorganisation of work processes. Many companies are taking steps in this direction, especially in the high technology and higher value added industries. Partly, this is because of the desire to implement new software systems, but is also based on the need to reorganise and capitalise on intellectual and knowledge assets.

Many of the ideas we have advanced here are strikingly similar to research on the learning organisation. In *Facing up to the learning organisation challenge*, Vol.1 (Nyhan et al., 2003, p.23) it is stated that:

'one of the keys to promoting learning organisations is to organise work in such a way that it promotes human development. In other words it is about building workplace environments in which people are motivated to think for themselves so that through their everyday work experiences, they develop new competences and gain new understanding and insights. Thus, people are learning from their work – they are learning as they work. This entails building organisations in which people have what can be termed '*developmental work tasks*'. These are challenging tasks that 'compel' people to stretch their potential and muster up new resources to manage demanding situations. In carrying out '*developmental work tasks*', people are 'developing themselves' and are thus engaged in what can be termed '*developmental learning*'.

The challenge for developing e-learning in enterprises is the integration of ICT in such a way that it supports developmental work tasks, rather than merely electronically cataloguing and regulating routine tasks.

3.4. New work roles

A further major implication of the use of ICT for learning in SMEs relates to work roles or organisational profiles. Few SMEs have full time training personnel. The training role, where it exists, may be undertaken by supervisors, line managers or personnel managers. We found instances where each of these groups was involved in e-learning. Most studies into e-learning have highlighted the need to train trainers in pedagogies and processes to support e-learning. We would not disagree, but would point out that these trainers will rarely be SME employees. It was very apparent that few people, if anyone, within SMEs, has much knowledge of the

potential of e-learning or of available e-learning opportunities, still less of the infrastructure required to access this learning. Part of the answer lies in regional organisations or networks providing easy access to learning opportunities. But this still begs the question of who within SMEs is going to assess training needs and organise the work environment to provide opportunities for learning to take place. We would suggest this might be part of a new and broader occupational profile, with responsibility for e-learning being combined with the development and implementation of e-commerce and ICT systems within the organisation. Often this role has been seen as a purely technical post, without considering the work organisation necessary for it to be effective. In a similar vein, present consultancy provision may need to be broadened, with technical support and advice on the implementation of new technologies and systems combined with the development of networked learning opportunities throughout the work organisation. For this to happen we need new models of human resource development.

3.5. Individual learning

The second glimmer of hope from our studies for hard-pressed policy developers promoting e-learning lay in the motivation for learning from individuals. We found many instances of employees who were pursuing e-learning programmes in their own time. However, this too raises questions. Most, but not all, employers who were supporting e-learning at work were primarily concerned with economic competitiveness. E-learning was seen as particularly beneficial because it offered the opportunity for just-in-time learning for employees to use new technologies and technology-based processes. Learning was closely related to productivity within the enterprise. In other cases, the decision to provide e-learning programmes resulted from requirements from customers in supply-chain networks. There were a few interesting exceptions. Some employers were prepared to support employees following e-learning programmes in any subject as the basis for building a culture of lifelong learning within their enterprise.

Employees, on the other hand, and particularly those employees giving up their own time at home for learning, were concerned with their own professional development and employability. E-learning was a means to increase their skills and knowledge, increase their qualifications with the aim of promotion at work, increasing their salary potential or enabling them to move to a better position with another company. There is obviously a very real tension between these two perspectives, a tension which may be quite hard to overcome. Ironically, the recent policy discourse on employability, which is prevalent in a number of European countries, may be increasing the tension between employability and SME competitiveness as regards e-learning.

4. Learning materials and learning platforms

4.1. Learning materials

Access to learning materials is a major issue in the development and implementation of e-learning in SMEs. As the European Commission notes in a recent document:

‘the development of the ‘digital economy’ and the wider use of the Internet and computer and networking equipment has raised accessibility to multimedia to unprecedented levels, thus enhancing opportunities for producers and consumers. However, this rapid evolution does not seem to have been matched in the new educational content sector. There is a general consensus that there is a lack of European educational multimedia content coming from institutional, professional and industrial sources in education, publishing and educational software. After an initial phase of enthusiasm, often described as ‘hype’, there are growing doubts about the real demand for educational e-content, and about its relevance for improving learning.’⁽²⁾

Our study bears out this assessment.

An initial examination of an extensive catalogue of e-learning materials available in Italy reveals a narrow range of subject areas. Most materials deal with the use of standard software packages and networking technologies. Next are learning materials for managers and for management activities such as marketing and e-commerce followed by e-learning materials for language learning. Beyond this the provision is very limited. Obviously these materials are largely targeted at technical, professional and management employees (white-collar workers). The situation is exacerbated in Europe by the question of language. E-learning was pioneered in Europe in the university sector. Most learning materials were provided in English. Whilst this may be acceptable in a higher education environment, most vocational learners require learning materials in their own language. The MESO (Multi Media European Software Observatory) study in 1998 drew attention to the problems of market led software and materials provision in different languages, especially languages of smaller population groups. Furthermore, whilst universities could draw on very broad disciplinary areas and on common structures of disciplines between countries, the learning needs of employees in SMEs are often quite specific with limited national (or even international) markets. There is a growing debate on the issue of globalisation and localisation in software and learning materials. The task of translating materials into different languages is not a straightforward technical matter but involves significant cultural issues.

⁽²⁾ European Commission Directorate-General for Education and Culture, Open invitation to tender No DG EAC 21/02 for the provision of services concerning the carrying out of studies in the context of the e-learning initiative.

There have been many policy initiatives and measures to stimulate the market provision of e-learning materials. A considerable number of projects have encouraged universities to provide learning programmes and materials for SMEs. In our case studies the lack of university participation in the provision of e-learning for SMEs was striking. This finding has been borne out in a number of further studies in this area (see, for example, the Leonardo da Vinci UK *Capitalisation report*, 2000). Although we have no direct evidence, it has been suggested that universities have a problem in understanding the learning needs of employees in SMEs and often lack the expertise to provide high quality learning materials. All too often, they also lack trainers experienced in moderating and supporting e-learning. Nevertheless many trainers and SMEs recognise the need to involve universities, especially if learning is to be closely related to knowledge development. We would suggest that universities have a role in supporting regional networked knowledge infrastructures rather than as a direct provider of training or learning materials to SMEs.

4.2. Flexible learning

A number of studies argue that e-learning should provide flexible, just-in-time learning with smaller learning ‘chunks’ rather than traditional course structures. This has fuelled the movement towards modular or unit based learning and the development of learning objects (that are an open standard supporting the creation of small elements or chunks of learning). This has been strongly supported by IBM and by CISCO, both of whom run their own corporate universities, and by publicly funded bodies such as the UK University for Industry (Learn Direct). The key benefits of object-based e-learning materials are seen as follows:

- (a) repurposing – content in learning object format can be more readily reused for different purposes and can be easily updated by replacing outdated learning object content rather than having to rebuild a new course;
- (b) personalised learning – customised learning can be produced to meet individual and specific needs;
- (c) performance support capabilities – learners are able to locate the specific information they need from learning objects in the context of their work;
- (d) distributed authoring – subject matter experts can author new learning content directly.

There is much to be welcomed in this approach. Learning programmes are broken into smaller component parts and can be reassembled for individuals or groups of learners. The learning objects also provide assessment exercises for each component part. This may well fulfil employer needs for flexible, just-in-time learning, but there remain reservations as to whether it can provide individuals with coherent programmes of continuing learning as part of a culture and practice of lifelong learning.

If learning is embedded as part of the work organisation, it may be possible to start to generate learning resources which are an intrinsic part of everyday work processes within an enterprise or clusters of enterprises. These resources would be derived from, and based on the working and learning activities of an enterprise. This is a wider vision of e-learning which is seen as a contribution to knowledge management or knowledge development. For example, the outcomes of work projects could be repurposed as learning resources for new work groups. In other words, learning resources are thus being generated by the enterprises themselves; the computer or ICT based work and learning environment is being used to support the creation and transformation of knowledge. The advantage of this approach is that it allows e-learning resources to reflect and support the different contexts in which learning takes place in SMEs.

4.3. Learning platforms

The development of learning platforms is another difficult issue. In universities, early development tended to be through the use of platforms which were locally produced and maintained. More recently, the trend has been towards the adoption of (increasingly technically sophisticated) platforms developed by private (mainly American) e-learning technology specialists.

Moreover, technological advance has not been accompanied by improvements in the pedagogies these platforms facilitate. Also, the cost of server software applications, let alone the difficulties in installing and maintaining server-based systems, is beyond the reach of most SMEs. This leaves them the option of using CD-ROMs, which although useful in some contexts, do not allow communication between learners, or buying off-the-shelf courses from providers operating their own platforms and servers. In this case the materials on offer are strictly limited and there is little or no opportunity for SMEs to develop their own learning materials or manage and develop their own knowledge systems. Once again, the obvious solution is for clusters or groups of SMEs to collaborate on a regional basis, with umbrella organisations or networks offering software platforms as well as learning materials. We have nothing against standardised commercial learning platforms. Our major point is that the learning technologies and systems should form part of wider knowledge sharing and development networks. It is also very important that they support the emergent standards for e-learning materials in order to allow interoperability and sharing of development efforts that facilitate localisation.

5. The cost and effectiveness of e-learning

5.1. Is e-learning a cheap solution?

The question of who pays is perhaps the most pressing unresolved and complex issue in the development of e-learning for SMEs. E-learning has been widely promoted as a cheap or cost effective answer to engendering and promoting lifelong learning within SMEs. Yet most researchers, and many consultants, are adamant that e-learning cannot be seen as a cheap solution. There may be economies of scale in the future but even this is open to doubt. Despite the many 'Return on Investment' (ROI) studies it is unclear whether e-learning is at present competitive when compared with traditional learning methods. E-learning must therefore be evaluated in relation to opening up access to lifelong learning and in providing richer learning environments for learning.

5.2. Public right or private product?

The European e-learning Action Plan (1996) implicitly accepts the need to support or stimulate the market for e-learning. The ways in which this might be achieved are further explored below. First we examine a number of difficult issues the EU does not address, including the tension between learning as a public right or as an economic product. Traditionally there has been a tendency in Europe to accept that initial education and training is a public right, albeit that in many countries, such as Germany, the responsibility and cost has been shared between the state and employers. In contrast, continuing vocational training in enterprises has generally been paid for by employers, with public subsidies in many countries through training levies and other measures. The spread of e-learning, and the promotion of lifelong learning both for competitiveness and employability, is fast breaking down these traditional divides. Many employees are following e-learning programmes at home in their own time. Who should pay for this? Should employers be subsidised in purchasing e-learning materials? Should producers be subsidised? Should the EU or Member States promote the role of the public sector in developing e-learning materials? Does the public sector have the infrastructure and the expertise? Should the private sector be subsidised whilst the market remains 'pre-competitive'?

5.3. Mapping policy

One approach to analysing and assessing policy developments regarding information and communication technologies for education was provided by Open Studio in France. They produced a policy mapping tool based on locating policy trends, using a two axis graph. The vertical axis measures the degree of support for learning technologies whilst the horizontal

axis plots the degree of regulation or deregulation of economic policy. This leads to the identification of four policy areas: support for establishment bodies, support for new business initiatives, conservatism and liberalism (see Figure 1).

The top left quadrant, where support for technology policy within a regulated economic policy leads to support for establishment bodies, is characterised by opaque markets. The development of learning technology tends to rely on cooperation between national telecommunications suppliers and larger suppliers of public education leading to service oriented development.

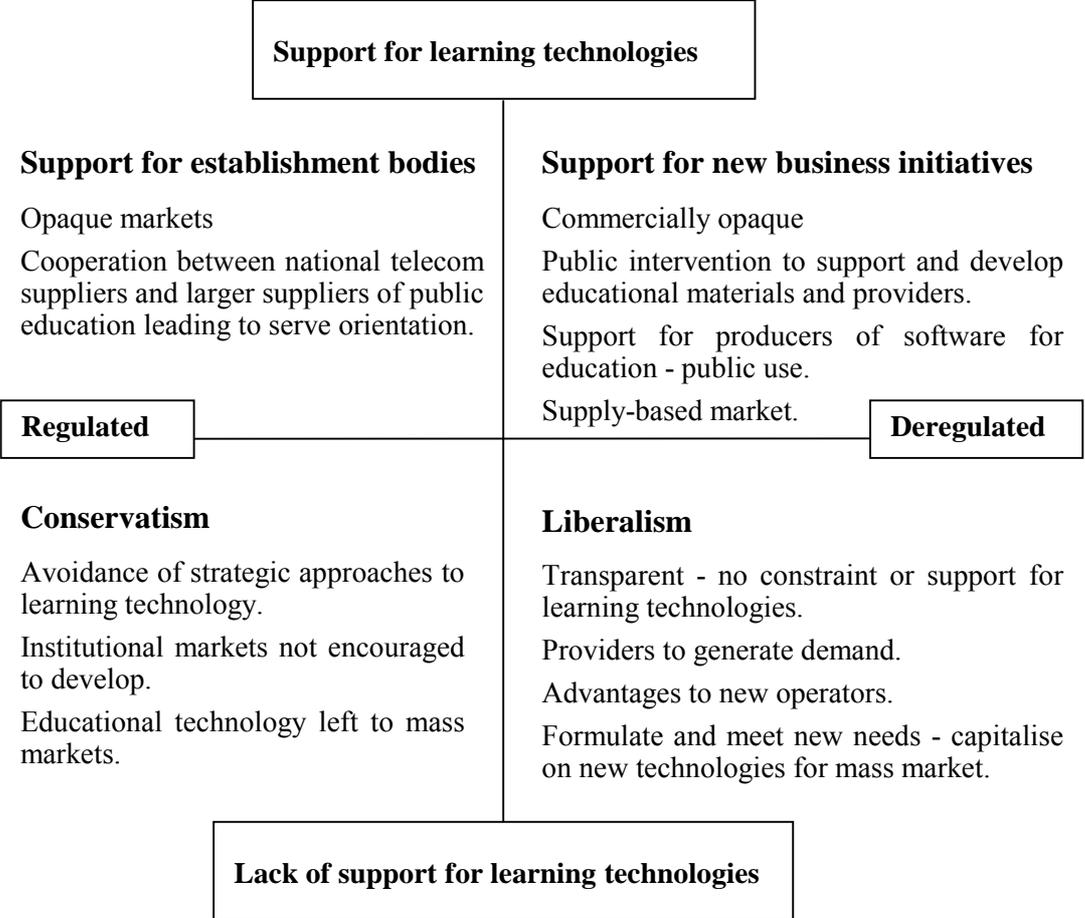


Figure 1 – Models for the use of ICT for learning in SMEs

The quadrant at the top right, where support for learning technology is combined with a deregulated economic policy, leads to markets which are also commercially opaque, as public intervention supports the development of educational materials and provides support to producers of software and hardware for educational and public use. Whilst this trend may lead

to the development of individual learning programmes, these remain within the sphere of education in a supply-based market.

The third quadrant (bottom right) depicts the lack of support for learning technology in the context of deregulated markets. The market is transparent, with the state neither constraining nor influencing the organisation of the learning technology market. Only the initiative of providers and the quality of commodities and services is likely to generate demand and the key determinants for learning technology development will be the same for every enterprise. In this scenario, advantages accrue to new operators who can formulate and meet new needs and to those able to capitalise on new technologies for a mass market.

The fourth quadrant (bottom left), marked by policies of lack of support for learning technology as well as a regulated economic policy, is characterised by avoidance of strategic approaches to learning technology development. As institutional markets are not encouraged to develop educational technologies, the mass market offers access to education and training developments. This is the much discussed ‘edutainment’ scenario.

The scenarios presented here are ideal types. In reality, in any European country and in any one of the different markets associated with education and training technology, there will be features belonging to each of the different areas described above. This raises two issues. First it illustrates the complexity of developing policies to manage innovation in developing e-learning for SMEs; second it highlights the importance of the ongoing debates about the desirability of public intervention in vocational education and training (VET).

Without wishing to stray too far from the central theme of this paper, the argument of neoliberal and liberal economists is that the state should not intervene unless there is clear evidence of market failures (e.g. the failure to provide adequate opportunities in education and training). The justification for intervention accepted by some educational economists is that the outcome of publicly supported provision is a ‘public good’ which leads to enhancement of the employability of the workforce. The provision of open and distance learning and educational technology has been defined as a ‘public good’ which deserves public intervention for two main reasons: first, it has intrinsic social benefits, the value of which are not delivered by market forces; second, there are imperfections in the educational technology market.

5.4. Learning at work or learning at home?

There is a further aspect to the question of who pays. Our study showed that many employees were pursuing e-learning programmes in their own time, using their own computers at home. If this model were to spread, it will effectively shift the burden of payment for e-learning from the SME to the individual. This in itself raises further issues. Many workers still do not have and cannot afford a computer, especially an advanced multimedia machine. Many also lack the discipline for home based study and the learning support is insufficient. Workers with

substantial responsibilities for childcare or care of elderly relatives would be effectively excluded. In any case if employability requires lifelong learning and a major component of that learning is through home based e-learning, the effect is to lengthen the working week and increase pressure and responsibilities of employees at the very time when a number of European Member States are attempting to reduce stress and working hours.

However, the issue of venue and time of learning cannot be reduced to one of cost. The use of e-learning may lead to a significant blurring of the previous divide between work-based or course-based learning and distance-learning at home. Workers may commonly download materials at work and take them home for learning. Equally they may use their home computers to follow up an issue which has been concerning them in the workplace. This raises questions for employers, many of whom have introduced restrictions on the use of the Internet in the workplace. In so doing, they may be restricting and blocking the impetus towards lifelong learning and a learning culture. It may be that the costs of e-learning, in the broader sense that we are using, cannot be accurately measured (at least in the short term) and that we will need to develop new understandings of rights and obligations and new forms of compromises in the use of ICT for learning in the workplace.

6. The evaluation of e-learning in SMEs ⁽³⁾

There was no evidence in our study of any meaningful or systematic evaluation of the impact of e-learning in SMEs. However, as this is a major problem it is worth exploring some of the issues here.

6.1. The validity and usefulness of research

The validity and usefulness of research into the evaluation of e-learning is often limited by a number of factors. First, most of the current evaluation at the business impact level has been driven by clients or buyers of e-learning (those who are funding the project) rather than by the designers, developers and front-line deliverers. Thus, the former are seeking to justify their investment.

Examining the explicit and implicit political and economic agenda of key agencies in the evaluation of e-learning is a major area for investigation. Is the purpose of evaluation about justification and valorisation or about improvement? How would funding agencies react if evaluation reports were published claiming that e-learning was not effective, that e-learning projects had actually failed?

Second, available evidence suggests that traditional classroom instruction yields a more favourable learner response than e-learning solutions. This issue represents a perplexing problem for proponents of e-learning. It also raises the question of whether evaluation of e-learning compared with traditional learning should be the real issue or is it evaluation of e-learning itself? Further research is needed to explore these two fundamentally different perspectives and generate reference materials which will look at the strengths and limitations of different models of e-learning evaluation.

Third, e-learning has been shown to be as effective as traditional face-to-face learning over a parallel series of comparative studies with American university students over a range of science based subject disciplines (University of Ohio, Centre for Evaluation Studies, 1998–2000). While recipients of face-to-face learning have expressed more satisfaction with traditional learning solutions, learning outcomes are no different for participants of e-learning programmes. Another key area of investigation should be whether these results are replicated in a European context, in SMEs and in vocational, as distinct from academic, subjects.

Fourth, many researchers have claimed that the evaluation strategies and processes utilised in other types of evaluations can be applied to e-learning programmes. This may or may not be

⁽³⁾ This section is based on a paper by Jenny Hughes and Graham Attwell entitled 'A Framework for the Evaluation of E-Learning', presented at the ECER Conference September 2002 in Lisbon.

the case. A further examination of widely used models and benchmarks is warranted and any inconsistencies and limitations in an e-learning evaluation environment must be identified, particularly for their applicability to the evaluation of e-learning in SMEs in Europe.

Fifth, the Return on Investment (ROI) studies indicate a positive return for companies implementing e-learning programmes (*Costs of networked learning*, 2000–1). Although most studies show a positive return based on cost reduction alone, (although often expressed in terms of revenue rather than capital expenditure) ROI studies need also to include analysis of benefits and ‘hidden’ costs, for example training the trainer staff costs, and time away from the workplace costs. New research is needed which attempts a broader analysis and, in particular, applies the ROI model to vocational education and training providers in the public sector.

Sixth, there is evidence of a growing practice of building evaluation into an e-learning process through the use of on-line tools that assess students’ perception and performance based on the belief that this can save time as well as money. This notion should be examined from the perspective of the pedagogical assumptions underpinning it and the robustness and usefulness of the data generated.

Finally, most of the credible, holistic evaluations of e-learning have been based predominantly on an evaluative approach based on systems theory or using a positivist–rationalist approach. This is actually the case in most evaluations of VET programmes. However, the limitations of ‘systems theory evaluation’ (feedback and error detection) may be more significant in e-learning than in traditional learning. Whilst in traditional learning settings the variables involved are quantifiable and relatively limited, the work of the Leonardo da Vinci Eval 3 project on the evaluation of e-learning, suggests that e-learning evaluation may have to take into account more complex and diverse variables. The relevance of the systems approach, particularly at policy level, should be challenged and alternative theoretical bases explored. Given that many researchers and practitioners are developing new pedagogic approaches to e-learning, with particular interest in constructivism, social learning theory and the use of ICT for collaborative knowledge development, it may be productive to examine the potential of social learning theory and practice in evaluation studies.

6.2. A theoretical basis and framework for evaluation

What is lacking is a theoretical and coherent research framework. There is little systematic research into broad-based frameworks that provide for the design of tools to analyse rather than just collect data. Furthermore, few papers collate the results of the existing research and classify it in an accessible way. Nor is there substantial evidence of work that extrapolates and tests ‘generalisable’ principles arising from the case studies and surveys or which comment on the implications or application of these in a European VET or SME arena.

Moreover, the gaps in knowledge impact on every level of the training and learning infrastructure. Policy makers and policy influencers need greater awareness of the implications of particular e-learning strategies and models in order to make informed decisions on e-learning policy and funding. There is a need for improved links between research and evaluation so that evaluation outcomes inform the research agenda and researchers can improve the validity of field observation. The skill base of e-learning evaluators needs to be increased. They also need tools and instruments which will increase their ability to make more analytic and interpretative evaluations of e-learning, using a greater range of methodologies. E-learning providers, SME managers and other education and training professionals need better evaluation products so that the design and delivery of e-learning programmes is improved.

7. Recognition of results of e-learning

7.1. Assessment and accreditation

Our investigations have shown that a broader definition of e-learning is needed to recognise the different contexts and forms in which learning takes place in SMEs. This leads to the issue of how such learning is to be recognised.

The issue of recognition of learning has a number of different aspects. Employees request recognition of learning for future career progression and in claiming remuneration. Traditionally learning has been recognised through processes of assessment and accreditation on standardised courses. Systems of credit accumulation have been developed to cater for modular programmes. However, standardised course provision lacks the flexibility for the just-in-time learning that SME managers are seeking. It is doubtful whether standardised course provision can cater for the considerable variety of different knowledge and skills required in SMEs. Standardisation is in opposition to the potential flexibility which constitutes one of the strengths of e-learning. In fact e-learning has been developed partly in recognition of the demand for faster curriculum development to match ever-increasing speeds of technological development and implementation. Yet assessment and accreditation procedures are notoriously slow to develop and administer.

Assessment remains problematic in e-learning programmes. Indeed many accrediting bodies still insist on traditional means of assessment through written tests and examinations. This is largely because of the difficulty in ensuring who is participating in assessment procedures conducted online. There is also considerable tension between individual assessment and accreditation and the increasing preponderance of team work in SMEs and group learning.

7.2. Progression and access

Recognition of learning plays a wider role in providing for progression. Traditionally prior achievement has tended to be measured by formal accreditation. The wider access to learning that e-learning facilitates and the implementation of lifelong learning policies within SMEs will require considerable rethinking. Recognition may be less through formal certification of learning programmes as such, but through the ability to practice the skills and knowledge in a work setting and to document (digitally) that practice. However, there are a number of open questions. Who should be responsible for verifying that learning – in terms of the requisition of new skills and knowledge – has taken place? Within large enterprises this has traditionally been the role of personnel managers. Some researchers have suggested a new role for social partners and trade unions in this regard. There have also been experiments with the use of new technologies – in particular smart cards – to record and update records of achievement.

8. New frameworks and models for developing e-learning in SMEs

The overwhelming conclusion of our project is that there is a need to develop new frameworks and models both for further study of the development of e-learning in SMEs and for policy development in this field. Such models and frameworks have to recognise the need to:

- (a) support the development of e-learning in SMEs;
- (b) bring together e-learning and knowledge management or knowledge development;
- (c) recognise the different contexts and forms in which learning takes place;
- (d) support coherent progression for individual learners with a wide variety of different learning needs;
- (e) recognise the tension between individual learning needs for employability and organisational learning needs or competitiveness;
- (f) provide strategies and frameworks for accessing learning technologies, platforms and materials.

In developing such models, e-learning cannot be viewed (as it is all too often) as a context for learning in itself. Neither, for that matter, can the issue of learning within SMEs be examined outside the wider societal and geographical contexts in which SMEs operate. Learning and working must be located as social interactions, and the so-called new paradigm of flexible ICT based learning must be examined within the complex and changing social relations of work and society.

We put forward three contexts in which to develop new models and frameworks, the first being lifelong learning. The development of e-learning within SMEs is largely driven by the demands of society for continuing learning throughout an individual's 'worklife'. The second is the learning region. SMEs operate in dense social networks, often organised or regulated at regional level. The third is networks and partnerships. In order to introduce lifelong learning, SMEs have to work in partnership with a wide variety of different stakeholders and organisations. These ideas are explored as a first conclusion to our research. They are not put forward as answers to the many policy challenges that face SMEs and policy makers alike, but as providing an initial framework for further research and development.

8.1. Lifelong learning, e-learning and small and medium sized enterprises

We believe that e-learning in SMEs must be firmly embedded within the framework of lifelong learning. However much has been written about lifelong learning, the focus has been

limited to the individual nature of learning – e.g. issues of access to learning opportunities or the accreditation and recognition of individual achievement. We would not deny the importance of these. However, the nature of learning as a social process is overlooked. Approaches to learning have relied mainly on theories of learning which see it as an abstract mental process and inadequately emphasise its social, relational and situated basis (Guile and Young, 1996).

Learning is a social process in which individual and institutional actors collaborate and interact on specific subjects. Knowledge is acquired, developed and applied through the interpretation of experience, based on idiosyncratic frameworks and networks that at the same time favour and limit the individual process of sense-making (Resnick, 1991). The potential of ICT within the enterprises we studied lay in supporting people to develop those idiosyncratic frameworks and networks and mediating social interchange as part of the sense-making process. Knowledge networks are underpinned by complex social relationships and the production of new knowledge is increasingly dependent upon access to such knowledge networks as well as opportunities to participate actively in them (Lundvall and Johnson, 1994). E-learning and ICT based infrastructures can facilitate and develop new knowledge networks. These networks are continuously changing as both work processes and social relations within the workplace change.

This dimension of lifelong learning is more complex than the provision of access to courses and traditional learning opportunities. It relates to the knowledge that influences the capability and competence of individual actors. In this context, lifelong learning and the acquisition of new knowledge presupposes communication or direct face-to-face contact between individuals. Such learning, both within SMEs and in wider dispersed communities of practice on an international and global scale, can be facilitated by information and communication technologies.

It goes without saying that the forms of lifelong learning we propose demand that learning be integrated within the overall work process, rather than seen as a separate activity. Yet, at the same time, it requires that workers have the ability to access both the technologies and the networks through which learning takes place and, most critically, the opportunity to apply new knowledge and learning within the workplace. This has important implications for work organisation. Work environments, work roles and work activities have to be organised in very different ways in order to provide frameworks for lifelong learning in this sense.

8.2. The learning region, e-learning and small and medium sized enterprises

We believe the idea of the learning region can provide a strong framework for the development of e-learning in SMEs. (See *Towards the learning region* by Nyhan et al., 2000. Much of the text in sections 8.2 and 8.3 is based on material from this publication.) Whilst the theories underlying the learning region were largely developed in response to policies for

lifelong learning, they have remained underdeveloped due to the lack of concrete proposals for developing and sharing learning and knowledge. E-learning can provide a mechanism for its development and implementation.

Education and training strategies which address innovation and development in a regional context are very different from traditional strategies. Traditional education and training activities tend to deal with the development of individuals as individuals. The emphasis is also mainly on formal or theoretical knowledge. As Guile and Young (1996) have cogently argued: 'the problem with individualist conceptualisations of learning is that they neglect the extent to which learning is first and foremost a human activity and, therefore, about social relationships and people participating in different types of community'.

Regionally focused education and training initiatives, however, concentrate on community-oriented learning activities carried out in partnership with other groups, undertaking activities not normally associated with the role of education and training agencies (Nyhan et al., 2000). This study has pointed both to the importance of informal learning and of tacit knowledge and to the strong role which networks play in developing the latter type of learning initiatives in SMEs.

SMEs operate within wider social contexts than just the pursuit of profitability. In the context of initiatives focusing on broader social as well as economic objectives, regional learning initiatives entail empowering local communities, through the involvement of people from different interest groups, to enhance their living standards and quality of life. According to Rees (1997), development is a collective process in which organisations and individuals with different goals come together to produce an outcome that is in the interest of all concerned. In the same vein, the place of indigenous development and innovation leadership must be taken fully into account, with 'top-down structural change and bottom-up development forming a dialectic in which local and regional development is bolstered' (ibid. p.11).

Learning and knowledge production are social activities and are situated in organisational and communitarian forms and processes bound by spatial relationships. Regional learning strategies are based on local cooperation and therefore must be interactive and cross-institutional. According to the theory of the learning region (see Stahl, 1994 and 2000; Koch, 1994), learning is seen as a system-orientated rather than an individual-oriented activity. The essence of systems-oriented (systems thinking) approaches lies in seeing causal relationships between things (between the external and internal environment, and within the internal environment) rather than linear cause and effect chains (Senge, 1990; Morgan, 1986). A learning region is constantly looking out at the external environment, while also at the same time looking in at its own system, trying to understand how the external and internal are interacting with each other (Nyhan et al., 2000). Learning in SMEs is dependent on social relations between workers (and managers) within the SMEs and between networks and social relations with other SMEs (and managers) and other agencies within the region.

The idea of the learning region also pays attention to the interdependence of the different aspects of learning – economic, technological, social and human knowledge and competence –

and attempts to bridge theoretical and practical knowledge. To assist this process the educational and training sector adopts an approach of ‘going-out’ to enterprises, (particularly small and medium-sized ones) and community groups, and working with them on tailor-made learning approaches, which integrate organisational and individual development. The formal ways in which people learn are thus reinforced by a form of learning which is embedded in everyday events, so that work and life routines become opportunities for learning (Nyhan et al., 2000).

The experiences of companies which have introduced new management and learning approaches along learning organisation lines, can throw light on how the principles of the learning region may be implemented. In an effort to achieve greater efficiency, many companies have moved in the direction of flatter organisational structures with autonomous work groups. Learning is embedded in this process, taking place in the problem-solving environment of the workplace (Nyhan et al., 2000). This complements formal learning. The role of the training department in this context shifts towards a catalyst role rather than direct training, assisting the different workers to pool their experiences and thus, through their own efforts, generate new knowledge in ‘knowledge-creating companies’ (Nonaka and Takeuchi, 1995).

8.3. Networks and partnerships

Regions also provide a spatial context for networks and partnerships to develop new learning strategies for knowledge production and innovation. Within a region, partnerships and networks are dependent on the interaction between the different actors who form communities of practice. Whilst these networks are based on direct relationships between participants they are also dependent, in part, on the influence and mediation of facilitators and intermediaries. The facilitation of learning and the generation of new knowledge, leading to innovation in networks, are based on the availability of both human and physical resources.

The creation of partnerships in which the various educational, social and economic agencies ‘transcend their differences and combine forces in favour of a joint strategy’ is crucial for the success of regional learning initiatives (Rees, 1997, p.12). Such partnerships, which have taken the form of consortia (made up of interdisciplinary teams, combining private and public interests) in the cases of the Belgian, Danish, German, Italian, and ‘industrial districts’, can provide guidance in various areas. These include the implementation of new technologies, problems arising from company growth, and competence development and training. They can also act as an interface between the local situation and the global environment, in particular through ‘interpreting the codified knowledge made available by the new technologies and matching it to the tacit knowledge of deeply rooted cultures’ (Farinelli, 1996, p. 19; quoted in Nyhan et al., 2000, p 20 and 23). Although we found these networks and agencies to be weak in the regions we studied, we did find recognition of the need to develop such networks and partnerships. The regional industrial associations responsible for SMEs have a key role.

Successful partnerships reflect local circumstances and are not imposed or developed according to some standard model. A strong partnership, arrived at through systematic consensus building, is one of the most important eligibility criteria for the receipt of funding under the auspices of the EU programmes. The importance of the partnership notion in providing innovative models for widening participation in change processes within local communities, and giving practical expression to the concepts of private–public partnership and area–based programming, has been noted in an OECD report on local partnerships and social innovation (OECD, 1996).

This study of e–learning and SMEs has shown the need to bring together a wide range of actors from different agencies, organisations and perspectives. A key role for regional learning and knowledge partnerships and networks is that they facilitate the building and transfer of tacit knowledge by direct and continual contact between actors from different organisations, based on spatial and cultural proximity. Tacit knowledge is built and shared by direct face–to–face contact, discussion and observation. Spatial elements are also very important in the transfer of implicit knowledge and in facilitating innovation. Regional networks for qualification and learning are based on partnership between enterprises and other regional knowledge institutions including universities, innovation centres, technology centres, and vocational education and training providers. Although such institutions are deeply rooted in the local environment they offer, at the same time, ‘the window to the global world’ because science has neither regional nor national borderlines. Regional networks provide access to global ‘science–based knowledge’. Institutions which are not able to participate in international networks can be linked through the region to global knowledge networks in order to avoid ‘entropic death’ (Camagni, 1991).

9. Agendas for change

It was never the intention of this report to attempt to come up with definitive conclusions. Rather it must be seen as a precursor to a more developed research project. We are aware that many practitioners and developers are seeking examples of good practice on which to base their own activities. Our research suggests that there is a lack of such generic, sustainable and easily transferable practice. Rather, we see a pattern of isolated examples which can provide a vision of the potential which e-learning may offer for the future. Given the fast changing technologies and practice in this area we would refer those who are searching for such 'good examples' to the many web sites set up for this purpose; starting points are Cedefop's European Training Village – <http://www.trainingvillage.gr> – and the European Commission's e-learning web site – <http://www.elearningeuropa.info>.

Therefore, rather than talking about conclusions, a list of issues and questions which need to be addressed in further research work are put forward here. These are advanced as part of an agenda for change; an agenda for developing the use of e-learning in SMEs. Interestingly although some of the issues are directly related to e-learning, many are concerned with learning in SMEs as part of a general lifelong learning strategy. This suggests a strong research and policy link between lifelong learning and e-learning.

In reality it has proved hard to separate the issues between research and policy and some appear in both lists. There is an urgent necessity for research to inform policy direction and development.

9.1. Issues and questions for research

An attempt has been made to group together the issues for research which arise from this study. Often, though, they overlap and cannot be seen as discrete research questions in themselves.

9.1.1. Work organisation

The first group of issues and research questions are concerned with the structure of work and work organisation in SMEs. The critical questions concern how workplaces can be designed to facilitate access to learning and to learning infrastructures and how to develop rich, work-based learning environments. This entails an examination of what forms of work organisation are needed to support e-learning in SMEs and how skills and knowledge gained from formal and informal learning activities can be applied in the workplace.

9.1.2. Pedagogies and learning cultures

The second, and closely related set of issues concerns pedagogies and learning cultures. Much more work is needed to define and analyse the training and learning needs of SMEs and of SME managers and employees. Attention also needs to be paid to the appropriate human resource strategies for SMEs and to examine the new organisational profiles needed to support learning in SMEs. In an e-learning context there is a need to develop effective pedagogies, materials or e-resources for SMEs.

9.1.3. E-learning infrastructures and materials

New definitions of e-learning are required providing a much broader understanding of how electronic media and applications can be used to support learning. At the same time we urgently need an audit of what e-learning materials are available for SMEs and in what subjects and languages? Closely related to this is the necessity for further research on the localisation of software and learning materials. Finally there is also the requirement for new and agreed technical and social standards for e-learning materials and platforms.

9.1.4. Knowledge and learning

The fourth group of questions is related to our understanding of learning processes and the relationship of learning to knowledge development and knowledge sharing. The first important issue concerns how tacit knowledge can be made explicit. Further research is needed to focus on the differences between information and knowledge and the implications for learning, particularly within small and medium sized enterprises and at a regional level. This study pointed to a tension between individual learning and organisational learning. Finally, work needs to be undertaken on the relationship between e-learning and knowledge management or knowledge development.

9.1.5. Models and frameworks

The final group of issues for research is concerned with models and frameworks to support e-learning in SMEs. One important issue is the estimation of costs/benefits of e-learning and the potential returns on investment. At the same time it is necessary to establish and measure the effectiveness of e-learning. This will require new frameworks and tools. Further work also needs to be done on providing access to learning opportunities and promoting recognition of learning. This will require flexible frameworks to incorporate both formal and informal learning. Finally there is a need to identify new models and frameworks to support e-learning in SMEs. These should be based on the ideas of learning regions and partnerships and networks.

9.2. Issues and questions for policy

The policy issues arising from our report are strongly linked to the research issues identified. In resolving these issues there is a need for far stronger links between research and policy development and implementation. It would be useful to examine different research methods and cultures and in particular the Scandinavian practice of working–life programmes, with research activities paralleling and providing iterative feedback to policy and programme participants. In putting forward policy ideas it is realised that it is not possible to prescribe policy options for all situations. Policies will have to be worked out which take account of the different economies, sectors, cultures and histories of countries and regions in Europe. There is a need for differentiated policy support in different situations and contexts. Therefore the following list deals with policy issues, rather than recommendations.

9.2.1. E–learning infrastructures

There is an obvious need for all SMEs to have access to broadband networks and modern technologies. Regardless of context, all SMEs need access to quality advice on the implementation of new technologies. Advice on e–learning should be part of such a service. A second policy issue concerns how the development of e–learning materials should be supported. Another issue is the relationship between the market and public sector developers and providers. A similar policy issue concerns whether e–learning providers be regulated and if so, by whom. Would the state and region subsidise the costs of e–learning for SMEs? An important and related question is the level of state and institutional support and prescription regarding the development and adherence to open source software and open standards.

9.2.2. Networks and structures

The development of an e–learning infrastructure requires frameworks and support structures to promote e–learning in SMEs. This raises the policy issue of who should provide support for SMEs and how this should be funded? What organisations and agencies should be involved in supporting SMEs and what degree of regulation is necessary? Should these structures be sector based, based on national agencies or should they be focused on regional infrastructures? What degree of state and regional support is needed to bring together the different networks, institutions and interest groups involved in supporting e–learning in SMEs? What statutory rights do different actors have in the development, promotion and regulation of e–learning? What policy measures are required to support the development of learning regions?

9.2.3. Lifelong learning

Despite the recognition of the need for lifelong learning policies in every European Member State, there are many outstanding issues to be addressed. There is a lack of a learning culture within SMEs. The issue of how a culture of lifelong learning should be developed and

supported in SMEs is a complex one. Secondly, it is unclear whether present policies promote access to continuing and lifelong learning as a public right or a private good and what should be the balance and relationship between the public and private sectors regarding e-learning. This raises critical issues of funding for continuing learning and for e-learning. There are also considerable differences in access to learning and e-learning for different occupational and social groups. This raises the issue of how to prevent social exclusion. There are clearly critical links between labour market and educational policies. Policies in many countries currently do not coordinate these two areas. How can labour market policies recognise, support and reward lifelong learning? A final policy issue is raised by globalisation and the role of technology. How in Europe can cultural and linguistic diversity be supported by technology?

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Annex 1 – Summary of case studies

The Austrian study ⁽⁴⁾

The Austrian case study consisted of three main sections. The first was a survey of enterprises in the Tyrol region. The second was an analysis of the major issues arising from the survey. In the third section the policy implications of the findings were explored.

Tyrol is a province in the west of Austria with a population close to 630 000. It is an industrial, export-oriented region with a service-based employment structure, dominated by tourism. Other important economic sectors in the region are mechanical engineering, chemicals, raw materials and energy production, electronic and metal processing industries. 70 enterprises were chosen at random. A questionnaire was administered through personal meetings, by telephone or e-mail. A total of 27 enterprises completed the questionnaire. Most of the respondents were from mechanical engineering, building and information technology sectors. There were also responses from the following sectors: automotive, furniture, medical devices, marketing services, chemicals, recycling, tourism, forest industries and pharmaceuticals.

Ten companies stated that they have no relationships to other SMEs or external organisations ⁽⁵⁾. 13 companies have links to other SMEs which act as suppliers, customers or partners. The number of employees in the different enterprises ranged from four to approximately 250: on average companies employed 70 staff. The number of university-educated employees was low. Most employees were skilled workers and a significant number had completed courses at commercial or technical schools. 21 enterprises of the 27 surveyed did not use e-learning. Of these, three intend to invest in e-learning in the future and two more are considering doing so.

For the six enterprises that had already implemented e-learning, the major issue being addressed was up-to-date technical know-how. Learning needs were mostly identified from practical experience. Only one company used questionnaires to identify skill and information needs. In nearly every case ICT based learning is not part of an integrated learning programme, the only exception being the company with its own academy which has integrated ICT based learning in an overall learning programme. The major motivation for using ICT for learning was that it was considered to be cheaper than ‘normal’ training. Other important considerations were ease of use and integration of e-learning in the supply chain.

⁽⁴⁾ This study was undertaken by Friedrich Scheuermann.

⁽⁵⁾ However, all Austrian enterprises are members of the Austrian Economic Chamber which acts as the national umbrella organisation for the nine regional Chambers - one in each federal region and comprising 110 trade associations for different industries.

The companies were not always able to select the appropriate ICT based learning materials as they often depended on larger enterprises to provide learning materials, e.g. simulators or technical information. Of those enterprises that could locate their own materials, only one had undertaken market research into what was available. There were different approaches to selecting their students for training programmes. One selected according to the skills and interests of the employees in e-learning. Another enterprise invited all production employees to join the e-learning programme. In a third enterprise all new employees were required to follow an ICT based induction programme.

The enterprises had different approaches to the organisation of ICT supported learning. Learning took place inside and outside the enterprise and during and after work time. When trainers were involved in the ICT supported learning, they acted as tutors and coaches. No additional qualifications were required for this role, with the background in traditional training considered to provide the skills required.

Three main barriers were holding back the development and implementation of ICT based learning. Firstly, there is the problem in adapting to this new form of learning. E-learning can be seen as impersonal. Shortage of time and financial restrictions were also cited as barriers.

A systematic approach to the integration of ICT into existing curricula is needed to justify the cost-benefit of e-learning. Most of the companies surveyed were generally satisfied with the outcomes of ICT based learning. However, one enterprise pointed out that the variety of products and instruments is too much for a small enterprise to handle and another criticised the lack of consideration in the ICT programme for local needs.

Two models of provision of ICT based learning are dominant. Some enterprises are using ICT based learning on their own initiative. However, the lack of support from public authorities and umbrella agencies (e.g. Chamber of Commerce) is a problem. Company owners or people in charge of training must have the knowledge and skills to implement ICT based learning. This is probably the main reason why so many enterprises do not use ICT based learning. Decision makers in SMEs often do not have the time and money to update their own skills and to develop strategies for introducing ICT based training programmes.

The second important model is supply-chain learning. This makes it easier for an SME to introduce ICT based learning as the supplier provides learning materials and know-how in the introduction and application of e-learning. However, this approach has disadvantages in that learning materials are often standardised and fail to take local needs into account.

Surprisingly only one company has contact with an academic organisation. Either companies are not interested in working together with academic organisations or academic organisations do not provide know-how or learning materials in this field.

Despite the efforts of the federal government of Tyrol to support SMEs in building up networks and clusters ⁽⁶⁾, companies did not make use of these for ICT based training purposes. None of the enterprises sampled were collaborating in a learning network with other SMEs. However, there is no doubt that informal learning takes place within such networks and they have the potential to develop as regional learning networks.

In a similar way to networks and clusters, support agencies could assist SMEs to benefit from the use of ICT for learning, but in this survey no instance of an umbrella agency facilitating learning was found. However, some companies receive grants for training programmes from institutions like the Chamber of Commerce and the Austrian Labour Market Services Agency.

In conclusion, the Austrian study revealed a confused picture. Whilst those companies that had implemented ICT based learning were generally satisfied with the results, they recognised problems with employee acceptance, costs and the poor supply of learning materials. Most companies do not as yet intend to introduce ICT based learning.

The Italian study ⁽⁷⁾

The Italian case study was based on a telephone survey and three in-depth case studies. The telephone survey was carried out in the Province of Presaro and Urbino (Marche Region) during spring, 2002. 150 SMEs were contacted of which 48 participated. The enterprises had between 50 and 250 employees. The main objective of the survey was to identify the frequency of use of ICT based technologies for training and the perceived advantages of e-learning for SMEs. The main findings were as follows.

Most of the SMEs interviewed organise training courses, although the planning is undertaken by external agencies. 46 % of SME managers interviewed were familiar with the definition of e-learning. However, only 15 % were aware of opportunities for their employees, whilst 18 % were aware of the availability of e-learning programmes. If the SMEs were to become involved in e-learning, 35 % would use the Internet, whilst 26 % would utilise a mixture of the Internet and CD-ROM based learning. The major perceived advantages of e-learning were cost savings, the elimination of the need to travel for training and the possibilities for the self-management of learning.

Case studies

The first case study was of an enterprise providing consultancy and training and, in partnership with its clients, managing innovative projects to enhance competence and develop professionalism. The enterprise has an annual turnover of about EUR 7.5 million and employs 70 staff. An interview took place with the project manager, responsible for the e-learning

⁽⁶⁾ A cluster embraces several companies that work in a similar business sector, e.g. Alpine Technology Cluster (<http://www.iv-tirol.at/En/Cluster>).

⁽⁷⁾ This study was undertaken by Elmo de Angelis.

sector. The e-learning team, developing techniques and methodologies for distance learning comprises three project managers, three educational planners, one expert in graphic design, six experts in content design, one html programmer, one expert in graphic programming and three content editors. The company plans training courses for large industries, private SMEs, consortia and public authorities. Firstly, the training needs are examined and agreed with the client. The training offered covers a wide range of HRD and management programmes although ICT based learning is used mainly for computers and language learning. Training is targeted at both students and employees in enterprises.

The company believes e-learning offers flexibility within the framework of continuous training and 'stimulates the culture of continuous updating as a professional reality for all employees'.

The major aim is to integrate e-learning with other methodologies and pedagogies in the traditional training system. E-learning was seen to:

- (a) offer an incentive to learners through the provision of flexible training courses capable of meeting individual, personal and professional needs;
- (b) contribute to the development of new pedagogical models and allow users to manage their own learning;
- (c) contribute to the creation of a continuous training culture through the active involvement of different social actors;
- (d) contribute to the training and retraining of those in charge of administering the education and training systems – both in the public sector and in enterprises.

The second case study was of an industrial association with a membership of 40 000 SMEs in the fields of commerce, tourism and service provision.

The geography and economy of the region presented particular challenges, being mountainous and rural and encompassing the problems of low incomes, an ageing population, steep demographic decline and high unemployment. Enterprises in the region, particularly in the tourism and commerce sectors, have to face up to structural change. Traditional training can be problematic because of distance and poor road conditions.

The industrial association supports SMEs by a number of measures, including the training of key professionals seen as essential to strategic economic development. The use of the Internet for training is seen to facilitate the use of technology and the search for information. Therefore, particular emphasis is placed on asynchronous communication, allowing time for reflective interchanges. E-learning also offers a strategy for cooperative learning and the use of rich resources. The need for training intermediate professional figures capable of supporting networked learning was seen to be very important. Such professional figures should focus on promoting the competitiveness of enterprises. In this region, where competitiveness and professional development cannot rely on formal training courses, the

sharing of experiences and the giving of mutual aid in facing daily problems, was considered to be of the outmost importance.

The Polish study ⁽⁸⁾

The Polish study included an examination of existing research including a survey of SMEs. The first part of the work was based on research undertaken by the Polish Agency for Entrepreneurial Development (PARP), the governmental body responsible for the support of the SME sector. It started by looking at barriers to the development and use of e-learning by SMEs in Poland. Up to now e-learning has been neither popular nor successful in SMEs, with four major factors sharing responsibility for this.

The first is technological. The high cost of telecoms in Poland, limited knowledge of the possibilities of the Internet, the expense of licensed software and the lack of confidence in the security of transactions over the Internet have inhibited SMEs from using advanced information and communication technologies. An additional barrier to e-learning is the limited computer and Internet literacy of SME employees. Despite this, the research suggests that SMEs are interested in the potential of Internet development. For those connected to the Internet, the most popular uses are administration and office management (73 % of those surveyed) and obtaining market information (84 %). More than a half of the respondents wanted to advertise their own company (56 %), and 44 % planned to use e-banking.

The second barrier is financial, especially following the overall slowdown of the Polish economy since 2001. Many SMEs are cutting costs and employment, and training budgets are often among the first items to be cut. The third barrier is the lack of a strategic approach to training in companies. The use of e-learning systems in companies requires the reorganisation of training processes. It is very difficult to convince clients of the need for such reorganisation. There is also a lack of needs analysis and of programme evaluation. Usually needs analysis is treated as superfluous. Decisions concerning employees' attendance on courses is most often not a result of planning, but results from enterprises' financial standing and employees' wishes. Few companies define goals and criteria to evaluate the effect of course participation. The lack of feedback causes problems in choosing programmes and in evaluating the outcomes. Over 80 % of the companies surveyed do not measure the effectiveness of courses attended by their employees.

The fourth barrier is attitudinal. Whilst traditional training provision is seen by employees as an incentive, it is difficult to persuade employees to participate in courses provided only through e-learning.

⁽⁸⁾ This study was undertaken by Andrzej M. Skulimowski.

E-learning models in Polish SMEs

As part of the Cedra ICT Network project, a survey of 100 SMEs was undertaken in July 2002. Questionnaires on e-learning were sent to companies in the information technology (IT), construction, and electrical equipment sectors. The largest was the IT sector (60 %). The size of companies was as follows:

- (a) 53 % micro enterprises – from 1 to 9 employees,
- (b) 41 % small enterprises – from 10 to 49 employees,
- (c) 6 % medium enterprises – over 50 employees.

Different e-learning models were identified. Large companies used e-learning for training their vendors, suppliers or subcontractors. All of the IT sector SMEs were using e-learning and were linked to a large company for which they are vendors, suppliers or subcontractors. The most common model was participation in e-learning courses on specific software or hardware organised by their larger partner, including both paid and free courses. SME staff took part in these courses to gain knowledge of products offered by the large company and to obtain certification.

However, participation of SME employees in such courses is usually not connected to learning policy. In most cases, participation of an employee in such courses was required by the larger company. It was sometimes initiated by individual employees reporting new requirements for vendors or subcontractors. The SMEs did not perform an evaluation of training. Accepting that the certificates received by employees were sufficient proof of new skills acquired.

67 % of IT companies surveyed used the Internet for e-learning. The remainder utilised intranet infrastructures. The major advantages reported were:

- (a) easy access to course materials,
- (b) lower course costs,
- (c) time flexibility (employees took part in courses at the most convenient time, without the necessity to be absent from work).

None of these companies compared the cost of e-learning with traditional programmes, possibly because of the lack of traditional provision in these areas. Besides the use of the Internet, a number of the companies, including 33 % of the IT companies, used CD-ROMs for learning. A major constraint implied by the choice of an e-learning mode is the need to use the English language. Most e-learning courses related to modern IT products are offered only in English. All the respondents were satisfied with the outcomes of e-learning and planned to expand the range of programmes.

There were also e-learning initiatives undertaken at an individual level. In this regard most employees (52) used 'free of charge' English language courses and software courses (28). This results from the availability of such tools on the most popular Polish portals, the use of

Internet based dictionaries being particularly notable. Individuals also took courses in law (15) and in product-related subjects (11).

The Spanish study ⁽⁹⁾

The Spanish report was based on an in-depth study of an electrical engineering enterprise in the town of Torredembarra, in Catalonia. The factory, which manufactures parts for electrical appliances, has 65 employees and a turnover of some EUR 7 million. A staff training programme has been developed as part of the application of ISO 9000. In an interview with the human resource manager, she explained:

‘The training has been in part a consequence of the implementation of ISO 9000, rather than the result of individuals’ motivation. Until then the company had never contemplated formal training. Well, in fact, it was not that the company did not think about training, but the training was in situ. There is a lot of spontaneous or informal training, which is not registered in any place, but when you explain to a person what she or he must do and how he or she must do it, you are training him or her, aren’t you?’

The lack of formal training can be explained both by the lack of a perceived need and by the very limited range of courses available to SMEs in the region. Training for SMEs is organised and financed by the Funacio Tripartita para la Formacion en el Empleo (the tripartite foundation for company training). Course provision is limited by demand – a minimum of 15 employees is required for each course. Provision is based on traditional face-to-face courses consisting of 16 hours teaching time a month. Employees have attended on a voluntary basis, in their own time. The main subjects are ICT and the English language.

Traditionally, grants have been available for a cluster of enterprises in a region or locality. In 2002 a new system allowed individual employees to apply for a grant. This enabled a wider range of training providers to become involved with a resultant broader curriculum including the use of ICT for distance learning. Courses available through the Catalan Institute for Technology deal with quality (ISO 9000), purchase management, storage management, accountancy and finance, and strategic management for SMEs. Support is available for up to three online courses. The Catalan Institute for Technology (ICT) provides course participants with a dossier which includes the contents and general information about course management and organisation. There are two face-to-face sessions for each course.

The pedagogy is based on individual study of learning materials supported by exercises which are sent to the tutor by e-mail. The tutor marks the exercises and provides feedback to the students.

⁽⁹⁾ This study was undertaken by Mario Barajas Frutos.

The company did not set any timetable or allocate any place for study:

‘Nobody said anything, but it was assumed that one had to study it at home.’

The interview with the human resource manager revealed that not even the manager of the company knows about the development of these courses, as she believes that these are questions which are not important to the company even though this contradicts the ISO 9000 policy.

‘In our case the manager does not accept people studying during working hours. I personally (human resource manager) studied the course at home, at weekends. Although it is likely that other colleagues studied at the workplace because they do not have a computer at home, so they take advantage of working hours to study.’

The interviewee (human resource manager) considered the advantages of online training to be flexibility, opportunities for acquiring and sharing information, and ease in contacting the tutor. Nevertheless, she stated that her company is different as few employees have computers and Internet connections at home and they would prefer to follow traditional distance-learning using the fax and post.

She believes that the workers’ motivation to participate in online training is currently based on individual interest. Another factor that motivates staff is that the range of subjects is now wider and more varied.

Approximately 80 % of Spanish SMEs are connected to the Internet. According to the regional government report (Generalidad de Catalunya, 2000), SMEs use the Internet for the following purposes:

- (a) information search,
- (b) data transmission,
- (c) financial transactions,
- (d) competition analysis,
- (e) personnel recruitment.

This survey showed that the use of the Internet for training in SMEs was not significant. (On-line learning in the company case study reported here was only introduced in 2002.) The use of Internet and other ICT technologies for learning in SMEs in Spain is a very recent development. However, unlike larger enterprises, it is individual employees and not the companies, who are driving this change. Thus the take-up of ICT based programmes is largely restricted to white-collar employees.

However, it is notable that the enterprise examined in the case study is considering the use of ICT for an online training programme that addresses the learning needs of blue-collar, shop-

floor workers as well as white-collar employees. The human resource manager interviewed stated that if the motivation issue is dealt with, it will be possible to elaborate a programme with more specific medium and long term objectives. Nevertheless, it is clear that enterprises are more interested in basic training. More advanced training is seen as an individual responsibility. Policies are needed to develop and sustain a training culture in SMEs. There is also a need for better strategies of public funding to provide access to training programmes. SMEs have informal, friendly cooperation relations between them and there remains the possibility of transforming these informal relations into cooperative networks for training programmes supported by information and communication technologies.

The UK study ⁽¹⁰⁾

This UK case study was based on research undertaken as part of the EU funded Learning support for small businesses (LSSB) Adapt project. LSSB was a large multi-partner project coordinated by Birmingham City Council as a part of its strategy to confront structural change in the city's economy, and in particular to find ways to support SMEs in remaining competitive in the global economy. Its primary objective was to pilot the provision of training to SMEs and evaluate the effectiveness of various media.

An 'umbrella agency', Birmingham City Council, in conjunction with a range of partners, organised this project. In addition to coordinating the central resources provided through the Adapt programme, Birmingham City Council chose to enhance the form of support SMEs received through the provision of on-site support from experienced consultants in the field of SME development.

Whilst the project started out with the intention of converting existing learning materials for distance learning, it was extended to provide a more strategic ICT vision for SME owners. Clear messages from a number of sources suggested that supply-side courses were not the only type of performance support resource that SMEs wanted (Webb, 2001). The project team adopted a more strategic stance as regards SME business development. Regular meetings and workshops were convened for SME owners in an attempt to raise owners' consciousness about the potential significance of viewing e-business and e-learning as two strands of a single integrated process – in other words, to recognise that the Internet constituted a vital resource, which could be used to reconfigure working and learning practices in all their different guises. The SME facilitators assumed responsibility for certain aspects of the research process. Instead of only being required to pass on information about business strategy and technological options, the facilitators were asked to act as 'first-line' gatherers of information about the business challenges facing SMEs participating in the LSSB project and the contribution that e-resources might make to overcoming these challenges.

⁽¹⁰⁾ This study was undertaken by David Guile.

The project developed a simple electronic tracking system to monitor and evaluate the number of visits each registered user made to the project web site. It also identified a number of SMEs which had adopted very different responses to the use of e-resources to support knowledge creation and organisational learning (see Guile, 2002). This approach enabled identification of the diversity of ways in which SMEs were:

- (a) responding to the potential significance of viewing e-business and e-learning as two strands of a single integrated process;
- (b) reconfiguring working and learning practices in all their different guises to make maximum use of e-resources;
- (c) introducing new learning practices to facilitate learning with e-resources.

This study drew both on material from the above-mentioned Birmingham project and on a case-study on one of the SMEs involved in the project.

The company chosen for the case study was ECA, a split-site forging company dealing with brass, copper and aluminium. It is subject to intense pressure from low-cost overseas competitors who are increasingly winning contracts from the UK. It has an annual turnover of approximately GBP 2 000 000. The owner offered all his employees access to the LSSB web-site. The web site consisted of the following elements: a homepage; a registration form; an electronic information guide; a course search engine; course materials; and business resources. Once registered, employees could access the web-site at any time of day or night and from any site.

The owner did not assume that the resources provided through LSSB would specifically meet identified company training needs. Rather he was more interested to use the feedback about the use of e-resources from the LSSB project team to identify the extent to which such resources were perceived by his employees to be of value. Adopting this laissez-faire stance towards e-resources means that the owner did not specifically stipulate a set of learning objectives for the participation of his company in LSSB, nor did he consider the pedagogic implications of using e-resources for either learners or those who held a responsibility for training. Furthermore, he did not provide any training for staff as regards the use of the LSSB website as the on-line instruction manual was deemed to be sufficiently user-friendly for all staff.

Interviews were carried out with three members of staff at ECA, the first being the production manager. He had used the LSSB website to conduct searches about the cost and benefits of new engineering equipment, as part of a benchmarking exercise on pricing of products and after-service support, and to enhance his leadership and management skills. In the main, these searches were conducted during the working day and he either bookmarked sites for future reference or downloaded material to be read at home. According to the production manager, the two main benefits of the introduction of e-resources more widely within the company were as follows: first, the e-mail system was used to support knowledge sharing and to involve staff more immediately and more transparently in discussions; and second, staff in

customer care were able to liaise with suppliers more swiftly about problems with batches of supplies.

The administrative assistant who was interviewed, found access to the LSSB website to be of immense value. Apart from regularly consulting the Business Guide, she had perused the courses during the working day and either bookmarked sites for future reference or downloaded material to be read at home. When asked whether she felt the introduction of e-resources had any benefits for the company, she identified the use of e-mail to improve communication inside the company and with customers.

Whilst attending college the apprentice engineer, the third person to be interviewed, had used CD-ROMs as a resource to familiarise himself with various engineering techniques, and as a part of his key skill study. In the main, he was encouraged by the college to act as a self-directed learner and to ask questions only when he failed to understand the content on a CD-ROM. As he observed, the culture of apprenticeship means questions are rarely asked. However, he commented that most of the CD-ROMs used for training in the college were rather didactic and uninspiring. On reflection, the apprentice engineer feels he learnt most from the 'war-stories' provided by other apprentices or the more experienced staff. He, like the other interviewees, acknowledged his awareness of the value of e-resources for transforming working and learning, mentioning the introduction of a customer support system as an important new development.

There is clear anecdotal evidence that a considerable number of employees accessed the LSSB website and found the resources that had been made available extremely useful. On balance, it appears as though ECA's pattern of usage is very similar to the pattern identified in the larger evaluation. The Business Resources were the most popular area of the website and regularly used in the workplace. Although the course materials were often deemed useful, it appears that most employees downloaded them to study them at home.

What is striking and revealing is the very short time periods people are either prepared to, or are able to, spend perusing websites at work. On the one hand, there is a clear message to web designers about ensuring the user-friendliness of their sites. On the other hand, there is a clear message to policymakers about the restricted scope for people to use e-resources to undertake any form of just-in-time learning in the workplace. Where such learning did occur in ECA, it was a part of a formal training session organised in conjunction with a local college.

By not considering the pedagogic implications of using e-resources to facilitate learning in advance of participation in LSSB, it took ECA sometime to move from an adaptive to a 'reflexive' model of learning in the workplace (Guile, 2002). In other words, the company assumed that the primary purpose of e-resources was to access relevant information, rather than to encourage workers to be more proactive and explore the possibilities for rethinking the design of work processes, marketing strategies, etc.

The main, and unintended, benefit from ECA's participation in LSSB, which emerged gradually over two years, was the widespread recognition of the value of using e-mail to structure discussions about improving the production, finance and marketing processes.

Based on feedback he received from his staff, the owner realised that the primary value of e-resources had been to enhance communication and knowledge-sharing within his company. First, messages that were previously sent as memos and promptly lost or disregarded were returned to at a later stage, with the result that more colleagues became involved in discussions and hence in the resolution of workplace problems. Second, e-mail was gradually used to foster dialogue about work processes and product/service delivery across intra- and interorganisational boundaries.

Annex 2 – Semi structured questionnaire

Cedra ICT Research Network (CiRN)

Joint Cedefop–European Commission study on ‘E–learning in SMEs’.

This questionnaire should be taken as a guide for the case studies to be undertaken in different countries. Some questions may be irrelevant for particular studies, whilst in other cases you may wish to add supplementary questions.

As you will see from the questions we are particularly interested in the pedagogies deployed, rather than technological implementation. However, we also recognise that the technology for e–learning is inseparable from pedagogy and therefore at times you may need to comment on particular aspects of technological developments and implementation.

It is also important to note that we are interested specifically in e–learning and not in the overall training policies and practices of the enterprises to be studied.

Questionnaire

1. Background

1. What is the sector and nature of the business?
2. What relationship does the company have with other SMEs and external organisations?
3. How many employees are there?
4. Do they all work in a central site?
5. What is the approximate annual turnover of the company?
6. Skills profile for company/numbers of university educated and blue–collar staff?

2. Objectives of the learning programme and pedagogical approaches used

1. What are the issues/problems being addressed by the ICT based learning programme i.e. what skill or information shortfall or problem is being addressed? How were learning needs identified and analysed?
2. Is the ICT based learning taking place ‘on–the–job’, on the shop floor or away from the job? Please elaborate on this.
3. To what extent is the ICT based learning programme part of a integrated learning programme entailing the use of other learning approaches – e.g. coaching? If so what are the other learning approaches? What proportion of the learning programme involves the use of ICT supported learning?
4. Why was the ICT learning approach opted for – what were the arguments in its favour?
5. How were the ICT based learning materials and programmes selected?

6. How were the e-learning materials developed?
7. What were the expectations in introducing ICT supported learning?
8. How were the trainees for these programmes selected? What are the backgrounds of the trainees who are participating in the programmes?
9. How is the ICT supported learning organised (times, places, etc.)?
10. What pedagogies are used for learning?
11. What role do trainers play in ICT supported learning. Who facilitates the learning? What level of support is there for students learning through ICT?
12. What training have trainers had for this role?

3. Partnerships, models and roles

1. What different organisations are involved in the ICT based learning?
2. What role does each play?
3. How did the different partners/actors become involved?
4. Why did the company adopt this model of ICT based learning and training provision?
5. What were the motivating factors in the company deciding to participate in the ICT based training?

4. Evaluating the strengths and weaknesses of ICT based learning provision

1. How was the ICT based learning provision evaluated – if so how and by who?
2. What criteria were put forward?
3. To what degree has the training been successful?
4. What are the main barriers to developing ICT based learning?
5. What have been the main problems in introducing and implementing ICT based learning and training?
6. What are the major strengths / success factors in ICT based training and learning?
7. What are the main lessons to be learned from developing ICT based learning opportunities?
8. How are learning outcomes assessed?
9. Has the company allocated sufficient resources to develop and implement ICT based learning?
10. How are the costs of ICT based learning measured? Are the costs higher or lower than traditional forms of training?
11. How is the ICT based learning financed? Did the company receive any external grant aided funding?

5. Future plans

1. Is the company happy with the results of the ICT based learning? Is the organisation satisfied with the outcomes?
2. Is it planned to extend provision in the future? If so to what new areas and programmes?
3. Does the company consider that its models of training and cooperation with other organisations will develop and change in the future?

Annex 3 – Participants in the study

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Cedefop (European Centre for the Development of Vocational Training)

The challenge of e-learning in small enterprises: issues for policy and practice in Europe

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The effective utilisation of e-learning resources in a small and medium sized enterprise (SME) depends on a sound learning infrastructure. This is the main result of a small research project, jointly undertaken by Cedefop and the European Commission (DG Education and Culture) that looked at the key issues in the use of e-learning in SMEs. A learning infrastructure is not just about computers and networks but entails the existence of a training strategy for human resource development. There is little evidence, apart from isolated knowledge-rich companies, to suggest that an individual SME is able to provide this kind of infrastructure. Thus, regional based support or advisory bodies must play a key role. E-learning in SMEs may be most powerful when it is integrated in company business processes through networks and systems for business development. This facilitates informal learning which is integrated with work processes. The tools or software systems used for learning may not be dedicated e-learning platforms but everyday business systems and software designed to promote learning objectives at the same time as business objectives. Thus, the idea of e-resources in place of e-learning materials is put forward.

The challenge of e-learning in small enterprises

Issues for policy and practice in Europe



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