E-Learning challenges in Austrian SME's.

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Abstract

E-learning is changing the way enterprises gain competitive advantage through improved human performance. Especially small and medium-sized enterprises have to face the problem that e-learning technologies, methods and strategies have mostly been developed for the needs of large enterprises and cannot be exactly transferred to their needs. SME's operate in almost every sector of the economy. As a consequence they vary widely in their learning and training needs. They have to deal with limited personnel, organisational and financial resources. The situation is furthermore stimulated by the difficulty to formulate detailed training strategies that will enable their employees to be better qualified to cope with increased competition. As they are more and more discovering the advantages of ICT-based learning it is necessary to provide a framework that takes into account these limitations and tries to find effective solutions. Based on a survey about e-learning in Austrian SME's (Scheuermann & Reich, 2002) the current state of ICT based learning in Austria is analyzed and suggestions for better implementation and use of e-learning are made with a special focus on cooperative e-learning approaches.

1 E-learning in Austrian SME's

Average annual growth of e-learning market in Austria is estimated to be 102 percent (European average: 96 percent). In 2003 this will result in a 116 millions EURO market (2004: 196 mill. EUROS). At the moment large enterprises have by far the largest market share but small and medium sized enterprises (SME's) are more and more discovering the potentials of e-learning (Zugmann, 2001). As the results of a survey carried out for CEDEFOP (European Centre for the Development of Vocational Training) show, e-learning activities of SME's often have to face a series of problems caused by different factors. This articles gives an overview of the results of the study that focussed on the use of e-learning in SME's in different European areas, with special attention given to problems in introduction and use of e-learning, different pedagogical approaches, involved partners and networks and further needs in research and development. The focus was set to the Tyrol region. Most enterprises in this area currently make no use of e-learning at all. According to the

study only a minority is willing to use e-learning in the future (Scheuermann & Reich 2002).

G. Hawke (Hawke, 2000) identifies multiple benefits of investing in the workforce, e.g. raising employability and earnings of employees, raising productivity and profitability of businesses, etc.. Those SME's that already introduced ICT-based learning programmes have recognized these benefits and tried to provide their employees with up-to-date technical know-how. All of them made the experience that their employees need more and specific skills for the proper execution of the jobs (Scheuermann & Reich, 2002).

2 Characteristics of implementation

The following statements give a short impression of the main results of the case study in relation to typical use of e-learning in Austrian SME's. These statements already show some roots of the problems in use of e-learning SME's have to deal with.

- Learning needs were mostly identified through practical experience. Only a few companies uses own programmes and questionnaires to identify skills and information shortfalls.

- Companies use all sorts of locations, e.g. 'on the job', on the shop floor, away from the job, depending on their needs and possibilities. Predominantly e-learning takes place at work-place and in specially equipped rooms in the enterprise.

- Companies do not always have the choice to select ICT-based learning materials and programs themselves. Many SME's depend on larger enterprises which also provide the learning materials, e.g. simulators or technical information. Out of the number of SME's that have the choice to select their learning materials themselves most of them don't analyse the market before selecting the program but spontaneously choose a product that seems to fit to their needs. In most cases they do not develop e-learning materials themselves. These are usually provided by suppliers or external manufacturers.

- Enterprises have very different approaches in selecting their students for training programmes. One method often used is to select them according to the skills and the interest employees have in e-learning. Another method is to select a group of employees (e.g. back office) to join the e-learning programme. In a third approach

new employees or these who change their work environment have to go through an ICT-based learning course The background of students is therefore varying very much. Learning itself takes place as well inside as outside of the enterprise, during and after working time or in special areas/buildings.

- The main focus of the enterprises is on "learning by doing". Partly employees have to learn autodidactic via e-learning, combined with face to face meetings.

- When trainers are involved in the ICT supported learning they play the roles of tutors and coaches. Typically no specific additional qualifications are required for this role. The skills of trainers are mainly characterised by their experience in traditional training.

- SME's do rarely evaluate their ICT-based learning provisions. If they do they mostly use one of three methods (in order of usage): evaluate learning through practical application (this aspect is also used as an evaluation criterion – employees should know their trade), by the department that is in charge of e-learning or instruct an external evaluator.

In general companies are satisfied with the outcomes of ICT-based learning but most enterprises have no plans to expand their e-learning provisions and encounter several problems. Out of the enterprises that make no use of e-learning only a few want to introduce ICT-based learning in the future.

3 Problems with introducing e-learning

Enterprises have to rethink their business and learning habits in order to facilitate implementation of e-learning as introduction of e-learning is often accompanied by problems relating to the management of the enterprise, learning culture within the SME or inadequate infrastructure – just to name some. These problems have to be addressed in advance otherwise e-learning will not be very effective.

3.1 Management problems

Lack of human resources is a major problem Austrian SME's have to handle and leads to alarming results: Often decision-makers think - independently from size and business sector of their companies - that their company does not fulfil some prerequisites for e-learning, e.g. people do not have sufficient time available; there is an unsatisfying learning environment, etc.

Decisions in the introduction of e-learning often do not depend on objective decision criteria but are related to the attitude of the person(s) responsible for training. If ICT-based learning is introduced the lack of know-how outlined above often results in very narrowed concepts of ICT-based learning, e.g. too strong focus on low costs, which does not encourage good appliance.

Owners/managers of SME's have their own learning characteristics and are often reluctant to devote time to formal learning.

Decision-makers in enterprises have to face requirements for new models and methods. They have to learn to benefit from new emerging technologies and applications that are playing a more and more important part in education (learning software, network-technology, e-mail, application-sharing, etc.).

Many small and medium sized businesses only have limited financial and time resources allocated to staff training and the prospect of loosing staff for one or more days a week for a course is not a popular option either. However, the use of ICT-based learning could be a solution rather than an unaffordable option as it is seen by some companies. It allows staff to study at the workplace (therefore avoid travel costs), use specific learning materials (if available) that are fitted to user needs and start acquiring further know-how whenever it is needed.

It is understandable that many employers are reluctant to provide staff training that may provide the individual with accreditation and the opportunity to move in higher positions in another company but many managers/owners of SME's have difficulties to accept the added value of further qualification of employees to the company in general (Scheuermann & Reich, 2002).

One problem we also encountered in Austrian SME's is described in detail by Goolnik (see Goolnik, 2002). He points to the importance of interests and individuals that reflect the business experience of the sector in which employers operate. These leading figures in a certain business sector have a more important impact than the views of those outside it [i.e. universities, colleges and other training advisers/providers]. Their example can be either positive or negative. These leading persons / enterprises have to be a primary target group if e-learning issues among SME's in a certain region are addressed. No hint for a support of these pioneers could be found in Austrian SME's.

One major improvement would be to introduce key persons in SME's better to the potentials of e-learning. Many personnel managers and persons in charge of training stated that they would need to know more about examples of good practice. Furthermore there is a need for further information and training courses too (Scheuermann & Reich, 2002).

3.2 Understanding of e-learning potentials

The learning culture in enterprises is of major influence on the quality of ICT-based learning. Hierarchies, power balances, controls, or the general esteem for training in SME's can be major obstacles to successful application of ICT-based learning. Enterprises have to develop a "learning culture" where e-learning does not mean the same as playing games on the computer but is honoured as self development and therefore strengthening the company. Learning culture also embraces the planning of learning activities on longer terms and the embedding of ICT-based learning in broader training concepts. In contrast to this concept employees are often forced to update their competencies by themselves. This is a very difficult task for many. As consequence Austrian enterprises often try do get rid of those employees who are not able to adapt their know-how to deal with new emerging trends and implementations. Learning culture also implies an understanding of qualification that is connected to real needs in working life. Certificates and formal qualifications only form a part of qualification. It's getting more and more important to acquire skills and knowledge in a short time for special purposes (Scheuermann & Reich, 2002). ICT-based learning directly addresses this continuous improvement of individual qualification, which is difficult to assess externally. Decision makers, personnel managers and superiors haven't got direct insight in learning advancements of their employees and have to change their understanding of qualification. As a result employees that are engaged and interested in learning often feel that they do not get enough support and encouragement by their superiors. ICT-based learning can generally be made more attractive through gratuities, recognition of services, experiences and other 'secondary' effects. On the whole qualification, learning and further training should be recognized as essential components of culture and development in enterprises (Hipwell, 2000).

These new orientation also includes a more strategic thinking. At the moment many problems are caused by the informal and unsystematic approach of SME's towards

ICT-based learning which often results in poor implementation and use of ICT-based learning. Research done by the D.E.L.O.S. project (Developing Learning Organisation models in SME clusters) on organisational learning in SME's shows that most SME's can be described as 'crisis-driven' which means that they exhibit little evidence of organisational learning behaviour. Information-gathering practices, knowledge acquisition strategies and competence development appear to be either absent or rudimentary, and the enterprise typically responds to challenges and opportunities rather than pursues an active policy of human resource development and strategic management. The evidence suggests that this type of firm constitutes the largest category of SME's (http://www.pjb.co.uk/npl/bp19.pdf).

3.3 Inadequate infrastructures

3.3.1 Lack of organisational and spatial prerequisites

Austrian SME's often lack organisational and spatial prerequisites for ICT-based learning. For small enterprises it is often too expensive to adapt rooms or buy equipment for e-learning on the job. Especially employees working in industrial and technical jobs lack suitable workplaces and often have to face bad conditions for e-learning on the job. Therefore it is necessary to find other solutions, e.g. construction of learning corners, learning islands or learning centres. It is important that employees have immediate access to information in order to get the qualifications needed for their work. Hence it is also necessary to analyse what help SME's need to establish structures that support ICT-based learning.

Some spatial and organisational limitations could be avoided by combining e-learning at home with work (see Kräutler, 1999) and to allow an open, flexible access. In the 2nd quarter of 2002 62% of all Austrians older than 14 years had a PC and 45% had internet access (fixed wire) (http://mediaresearch.orf.at/internet.htm). These figures suggest that some enterprises could try to outsource learning to their employees but none of the enterprise of the survey mentioned a plan concerning e-learning at home.

3.3.2 Learning materials

Although the market of ICT-based training is growing very fast there is a lack of adequate learning material for small enterprises. This is due to the following facts:
Problems with training amongst SME's often relate to an inability for them to articulate and scope their learning needs. There are common difficulties in assessing

the merit and value of offerings available, which are often perceived as failing to meet firm- specific needs. Finding appropriate training is also made more difficult by culture clashes with external training providers, especially in the public sector, who are seen as unable to understand business processes. Particularly micro-SME's have problems with cost of training programmes (and associated travel and subsistence) and problems in releasing staff (Pye et al., 2002).

SME's lack time and financial resources to make an in depth research about training programs that really fit to their needs as transparency in the market for learning materials and course providers is hardly given, e.g. Germany: 35.000 training centres, Chambers, labour market services etc. offer approximately 400.000 courses and seminaries (Siebold, 2002).

Many firms are highly specialised. That makes the development of learning materials expensive and hence commercially uninteresting. One company of the study experienced the problem that although learning material was provided by the supplier it did not really cover the needs of this company in a certain geographical and economical context (Scheuermann & Reich, 2002).
If enterprises find suitable learning materials they are didactically and methodically of poor quality in many cases. Most critics concentrate on the complexity and lack of user friendliness of products but also costs and time consumption are rated as unsatisfying. Quality certification of products would probably foster development of good materials.

A further problem is the broad use of Computer Based Trainings (CBT's). The availability and use of information and communications technologies (ICT) and associated services to facilitate the entire range of communications, interactions and transactions („Connectedness") is poorly developed. CBT's are still seen as state-of-the-art technologies and their use is insufficiently reflected.
As CBT's are so commonly used different settings are no problem at the moment - CD-Roms are easily portable and majority of employees has got a PC at home. If SME's want to improve communication possibilities for learning purposes issues related to time and place of learning have to be addressed, e.g. at work-place, at home, special learning centres in enterprises etc.

From a pedagogical point of view CBT's are problematic as they "facilitate" isolated learning. Today, learning in an enterprise is seen as a cooperative process which is happening along the working process of learners. New media have to integrate tools that support a more cooperate approach: via the learning media it should be possible to communicate with experts in and outside the enterprise, with tutors and coaches and other learners.

For a real integration of learning in working processes it is necessary to learn with real data and real projects instead of examples and constructed case studies – these emerge from working life themselves. Learning systems have to be implemented into work flow and have connections to the databases of the enterprises in order to find out the learning solutions (D'Atri & Pauselli, 2000).

3.3.3 Equipment

Enterprises see the level of technical demands ambiguously: many think that there is still need for upgrading in enterprises. Some companies have to face the situation that access to available technology is restricted to ICT-based learning.

In many cases technology is less the problem than the human resources (users and trainers) applying it. They lack know-how and are not used to ICT-based training which makes e-learning problematic.

The use of technology to enhance or broaden the general learning experiences for most adults and to assist teachers to deliver more effective learning is less advanced, and has until now been looked at in too narrow a way.

What is needed are 'good models of learning' which are enhanced by technology. While reviews of research show that there are some excellent pilots, they lack critical mass, secure funding and therefore the likelihood of transferability.

Nevertheless there is still a demand for development of simple and cheap solutions that facilitate learning on the job. Laptops, Tablet PCs, handhelds etc. encourage flexible, mobile learning but often lack linkage to other information and knowledge resources. Although Wireless networks can already be found in several Austrian SME's most enterprises still have fixed computers and equipment that do not allow a flexible use as it would be necessary for learning on the job (Scheuermann & Reich, 2002).

3.4 Missing organisational perspective

3.4.1 Cooperation of different actors

At the moment most Austrian SME's act as "individuals" and try to find isolated solutions which does not facilitate introduction of e-learning or improves quality. In future developments it is necessary to strengthen cooperation of SME's with other SME's, larger enterprises or public institutions (e.g. Chamber of Commerce). Development in this field has to aim at two goals:

- SME's cannot afford infrastructure to run learning environments or the production of tailored learning materials. If SME's pool their resources they can afford high quality products. Cooperation in that sense could help SME's to reduce costs and pool know-how.
- SME's often need specific know-how or information that they can easily get with information and communication technologies. In many cases there is even no need for worked out learning materials if video-conferencing or other tools for communiation are available. Cooperation could as well be established in the sharing of information and know-how and lead to collaborative forms of learning.

Often Austrian SME's cooperate with other enterprises in e-learning if they act as suppliers of these enterprises and get learning materials and concepts from them. As some SME managers stated they profited a lot from this constellation. On the other side the learning material provided by larger enterprises is often very standardized in order to facilitate delivering as many other companies as possible, which does not take into account local needs. Furthermore the supplier tries to pack as much information as possible into the learning materials which makes it very difficult for a small enterprise to filter the really necessary information (Scheuermann & Reich, 2002).

One way of working efficiently with a number of SMEs is to make contact with a cluster or a network of them. Co-operation between organisations within markets has long been identified as a factor in economic success and networking between organisations can contribute to stability and reduce uncertainty. These networks can evolve over time as 'natural' clustering's of enterprises, or can be 'induced' artificially as a result of interventions like the development of business or science parks.

As a large proportion of SME's are in 'crisis management' (describes a high proportion of very small enterprises and new start-ups that respond to challenges

and opportunities, their decision-making strategies are shaped by a dominant personality and do not have industrial relationships) rather than pro-active learning situations they need to be encouraged to adopt a more participative style of collective learning. Support services need to be provided and resources pooled (Hawke, 2000). No evidence could be found that Austrian SME's build up such co-operations or even on a larger scale are engaged in regional learning networks as described by T. Stahl (Stahl, 2002).

He mentions three major successes of the learning region concept: First its success in promoting local changes, in empowering SMEs through networks and partnerships and, in general, in fostering innovation. Several of the concepts could prove to be suitable to deal with learning issues, especially considering that SME's are consumers of education and training with particular requirements and constraints.

Partnerships and networks at local and regional levels could certainly stimulate new experiments, actions and directions for learning.

Systematically, the learning region concept uses complementary interests, competences and infrastructures of local actors to increase and exploit bottom-up the development potential of enterprises, institutions, administrations and human beings by way of partnerships and networks. Not denying all of the economising and rationalising potential that is available when SME's and other actors co-operate at local level, the innovativeness is increased enormously.

Clusters of SME's, lager enterprises and public institutions that already exist in most European countries could act as starting points for the construction of learning networks. As an example Tyrol region in Austria can be taken: Government in Austria and regional government in Tyrol have lanced initiatives in creating regional clusters. These clusters are built up by several enterprises of a specific branch; e.g. Alpine technologies clusters in Tyrol (http://www.alpine-technologies.com). Informal knowledge transfer is already taking place in such networks but could be expanded into other areas.

3.4.2 Learner

Further training and education in enterprises has to aim to develop potentials of employees and therefore employees have to be seen as key factors of success and potentials of the enterprise. If that is the case, strategic implementation of e-learning

has to be developed in other directions as the learning-off-the-job offerings which are so commonly spread in Austrian SME's at the moment, e.g. learning on the job, learning-near the-job, etc.... (Scheuermann & Reich, 2002). This change is possible if the increase of the worth of ones own work force and personal further development are seen as central elements of further training. Fears, goals, advantages and disadvantages have to be communicated, discussed and continuously reduced. Integration and information of employees in projects is a key success factor: Resistance and frustration of employees caused by insufficient integration cannot be "repaired" or only with high efforts. Certainly the enterprise will have lost a part of its personal resources, e.g. commitment, creativity, etc…

Employees have to be encouraged to learn to actively take part in change processes instead of reacting to orders "from above". As a consequence, employees will have to acquire new know-how by themselves and move on to self-directed learning. Hawke (Hawke, 2000) states that SME's can have advantages over larger enterprises in changing out-dated attitudes towards learning: The managing director is usually highly visible, and is therefore better placed to remind people of the benefits of a learning orientation; learning projects and teams find it easier to make an impact and involve people; closer personal contacts create an environment where critical questioning and suggestions are likely to be heard.

3.4.3 Training provider (intern / extern)

SME's are by nature of their structure and competence often unable to provide training themselves for newcomers or further training for their own employees. This is at first glance not a new observation, even if it does not for instance generally apply to certain sectors of the manual trades. In most cases training provided by a competent education enterprise is a more effective solution for SME's than internal training (Scheuermann & Reich, 2002).

The consulting of SME's needs special requirements on the side of the consultant. SME's have a number of characteristics, e.g. the co-operation of the management on the technical – operative level, a rather close and personal relationship with the employees, a rather patriarchal style of running the enterprise, a low degree of formality and organisation and the lack of hierarchies. This leads to specific problems, like a 'dominance of daily business' (and thereby neglecting the co-operation with the consultant) and unsatisfactory information about the enterprises' environment. The demand for consulting is often very reactive and depends strongly

on the attitude of the SME-owners and management towards consultants (Kailer, 2000).

As Stahl points out modern enterprises require learning as an integrated activity. That means that external training institutions have to act in a customer-oriented way in order to foster these activities (Stahl, 2002). As stated above there is still a lot of confusion in SME's concerning the role of learning and of human resource development in management policy, e.g. stereotypes, traditional thinking and irrationality. This requires capacity and competence in providing consultancy. Because of material restrictions there are also limitations in relation to human resource development. Most of them are financial and organisational (it is never easy for enterprises to send their staff to external, long-term seminars). Training institutions have to deal with these problems creatively. They should view these restrictions as challenges to foster innovative solutions. Training institutions need new concepts to meet these challenges. A close co-operation with SME's is thus needed to deal with these problems and to integrate the activities of the external institution into the enterprise.

4 Conclusion

In further research the broad definition of SME's proposed by EU has to be split in sub-categories if it is constituting the basis for analysis. It lacks qualitative criteria which can be seen as typical for SME's, e.g. majority of SME's are family enterprises; entrepreneur has a central position of power; etc. Small and medium sized enterprises embrace very different forms of organisational structures and work in very different branches – from a traditional handicraft enterprise with less than ten employees to an innovative enterprise with 250 employees and several branch offices. It is obvious that these different kinds of enterprises have different demands on knowledge and knowledge management (OECD, 2000).

If better E-learning solutions are to be found specific groups of SME's according to quantitative and qualitative criteria have to be identified that can be treated in similar ways. This is necessary as it is too expensive to develop single solutions for specific SME's at the moment.

E-learning solutions in modular systems could then be easily adopted to different needs of SME's and could be upgraded or downsized according to the immediate learning needs of the enterprise.

SME's have to develop new organisational structures for the implementation of cooperative and collaborative forms of learning. At the moment most SME's implement isolated learning solutions that do not touch the needs of cooperative and collaborative forms of working and learning. A further step in e-learning would require investment in technology that supports synchronous as well as asynchronous communication at the workplace. This is probably too expensive for most SME's but costs could be reduced by cooperation on two fields: investment in technology and sharing of information.

New approaches are needed in terms of understanding the broad context of learning. Pedagogical approaches in Austrian SME's are often inadequate and do not meet the needs of E-learning as traditional concepts are adapted to E-learning. There is also a lack of organisation of flexible learning solutions in SME's and cooperation among actors is hardly given. Furthermore there is still much to be discovered about how people learn using different technologies, particularly in relation to interactivity, and how materials can be developed and structured to enable all learners to make effective use of them.

Learning at the workplace should partly replace "old" teaching in seminaries and face to face courses away from the enterprise but the task to do this is difficult. Learning should not take place **besides** work but **with** work. Learning at the workplace is different from learning at school and in seminars. It is not important to go through a subject matter systematically but to solve problems resulting out of practical application. A problem occurs during work flow and has to be addressed directly without the detour of a complicated general further education. Therefore flexible learning media is needed. CBT's can only be part of the solution – they are too static, present a topic in a very closed way and often do not fit to the special working place situation of the employee.

The term "e-learning" itself is somewhat ambiguous in a world that is rapidly changed by technological improvement. Where does e-learning start and where is its end? How can we draw the line to informal learning – is it necessary to differentiate?

Different technological solutions get connected to each other and the internet and more and more features are added, e.g. multimedia messaging via mobile phones. Learning is getting more and more mobile with the help of sub-notebooks, handhelds or mobile phones. Especially communication and information retrieval via mobile phone or fixed wire is an important "learning approach" for SME's.

As the Austrian case has demonstrated solutions have to be found that give SMEs' (affordable) access into these new dimensions of learning.

5 Literature

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