

## Informal learning and the use of Web 2.0 within SME training strategies

Ileana Hamburg, Institute for Work and Technology  
Timothy Hall, EMRC-Educational Media Research Centre, University of Limerick

### Summary

Small and medium sized companies (SMEs) have particular needs in facing the challenges of their daily operations; about 10% of them quote lack of skills as a barrier to growth, highlighting the link between training and sustainability. In order to keep their competencies updated, staff from SMEs need access to appropriate educational opportunities and new technologies, particularly eLearning, which by using Web 2.0 applications enhance knowledge sharing, cultural interchange and networking.

Learning by using Web 2.0 (eLearning 2.0) is based on tools that combine ease of creation of content with web delivery. In eLearning 2.0 the driver is the worker, as the content can be created by the users, individually or together. Using the familiar tools of Web 2.0 (such as wikis, social networking, bookmarks, blogs, etc) everyone can be a learner-teacher, as the barriers to ICT based training are removed. With its clear focus on community, eLearning 2.0 is ideal for SMEs, as it supports natural informal learning by simplifying the tasks involved in working and learning in groups.

Communities of practice (CoPs) can also become a powerful way for SMEs to innovate and develop new capabilities, as they consist of voluntary members who share similar challenges, interact regularly, can learn from and with each other and would like to improve their ability to address the challenges they face.

In this paper we first summarise the current training needs and learning methods used in SMEs, outlining the features of Web 2.0 that may be utilised to fulfil these needs. Then we discuss if Communities of Practice are a suitable environment for informal learning within SMEs. Finally we offer an example of how informal learning and CoPs can efficiently improve skills within SMEs.

**Keywords:** Small and medium-sized enterprises, SMEs, eLearning 2.0, Web 2.0, Community, Strategy, Informal learning, skills, COP

## 1 Introduction

A priority theme on many national government agendas and, in general, at the European level is the improvement of the competitiveness of business and industry. Industries and governments work hard to keep pace with the increasing competitiveness of the knowledge-based global economy. Small and medium sized companies (SMEs) have particular needs in facing the challenges of their daily operations (Beer et al., 2006). Small and medium-sized enterprises are socially and economically important, since they represent 99% of all enterprises in the EU, provide around 65 million jobs and contribute to entrepreneurship and innovation. Many European SMEs are not ready for significant international social and economic changes, globalisation, market competition, and technological innovation (Cernian & Hamburg, 2006).

Recent studies of European SMEs show that about 10% of them quoted lack of skills as a barrier to growth highlighting the link between training and sustainability. This barrier is not a simple one. For an SME to manage and sustain business whilst engaging in training can be very difficult. Most SMEs do not have a formal learning culture; their priority is survival, leading to just-in-time activities, the benefits of training to the business have to be very clear and measurable (Atwell et al., 2003; Averill & Hall, 2005).

“In the SME environment, the outcomes of the training may need to be adapted to the actual situation in the company to complement other development activities” (Lewin, 2005).

The results of research carried out by the European Network for SME Research (ENSR) for the Observatory of European SMEs ([http://europa.eu.int/comm/enterprise/enterprise\\_policy/analyssi/observatory.htm](http://europa.eu.int/comm/enterprise/enterprise_policy/analyssi/observatory.htm)) show large differences between countries in the existing provision of continuous vocational training (CVT) activities in European SMEs. General speaking Northern and Alpine countries have the highest proportion of SMEs offering CVT. The size of the company is determinant for the ability to take advantage of new ICT for sharing and creating knowledge and for the development (updating) of innovative skills. The smaller the employer, the less likely they are to use formal courses or eLearning and the more they are reliant on in-house workplace training. They also use visits to expos/trade fairs, conferences, reading of professional literature, etc to improve their competencies and resort to the training market only when they need to obtain skills that can not be provided in house.

“Informal” is a positive way to regard learning, a central aspect of socio-cultural learning. Social networks, such as communities of practice (CoPs) (see section 3), are favourable environments for informal learning. CoPs consist of voluntary members who share knowledge, ideas and interests, mentoring each other; they offer new opportunities for knowledge management and learning processes by using new forms of interaction between team workers and loose contact between the actors. Through active participation newcomers are oriented into the skills and culture of the CoP, experienced practitioners get new insights into their work practices. Members are also motivated to participate through opportunities to learn new skills and work practices in collaboration with local colleges.

A recent report of the European Commission underlines that, in order to keep their competencies updated, staff from SMEs needs access to ‘all appropriate learning opportunities and new technologies, for example eLearning particularly by using Web 2.0 applications and techniques to enhance knowledge sharing, cultural interchange and networking.

In this paper we first summarise the current training needs and learning methods used in SMEs, outlining the features of Web 2.0 that may be utilised to fulfil these needs. Then we discuss if CoPs are a suitable environment for informal learning within SMEs. Finally we offer an example of how informal learning and CoPs can efficiently improve skills within SMEs.

## 2 Training needs and learning methods in SMEs, the role of Web 2.0

In the 21<sup>st</sup> century, the basis for new competitive strategies in organisations lies in their ability to identify key needed skills for their staff and to encourage their development by all employees. This enables enterprises to keep in line with customer expectations and employees to improve their employability and career prospects. The main skills currently required by SMEs are technical and organisational and relate to enabling staff to operate flexible and interactive, they include: information processing and management, deduction and analytical skills, decision making skills, creative thinking and problem solving skills, communication skills, language skills, leadership and teamwork, team-based learning, strategic thinking, management and Business, and customer services. Many existing studies about skill development in enterprises focus on formal training practices provided by education or training institutions, usually leading to a certified qualification. However, enterprises, particularly SMEs, use both these formal and informal methods. Table 1 shows actual methods used in SMEs to develop the skills of their staff.

**Table 1: Percentage of SMEs using different methods for developing their skills**

**Source: ENSR Enterprise Survey 2002**

Type of Method	Number of employees			Average
	0-9	10-49	50-249	
Visits to expos/trade fairs	57	70	78	58
Courses/seminars/conferences provided by own personnel	19	38	54	21
Courses/seminars/conferences provided by external trainers	39	56	70	41
Study visits	17	22	41	18
Job rotation (in-house or in other firms)	8	17	29	9
Tutor/mentoring activities for staff	10	20	27	11
Promote reading of professional literature	36	39	58	37
Co-operation with consultants and advisers for developing internal competence	21	32	39	22
Meetings amongst personnel for knowledge exchange	32	46	56	33
Other activities	4	5	5	4
Do not know/no answer	0	0	0	0
% of SMEs not involved in any of the suggested methods	20	9	4	19
% of SMEs not having formal training activities	61	44	30	59
Average number of methods applied	3.0	3.8	4.8	3.1

The ENSR study (European Commission, 2003) show that small enterprises have a big preference for informal training practices. Such practices are particularly important when a company trains new employees and in aiding the frequent changes in organisation common in SMEs. Their most common learning strategies are “learning by doing” and “just-in-time!” quick informal methods aimed to solve daily work tasks and closely oriented to their business, see Table 3 for typical reasons. One negative aspect is that informal learning is often not acknowledged as learning within organisations. It is regarded as a part of the job or a method to do the daily tasks properly.

In many SMEs there is a lack of a “long-term” strategy for the vocational training of staff based on deep analysis of their qualification needs. In comparison, large enterprises support training activities on a wider scope and with a long perspective.

The study shows that of the employment categories benefiting from skills development activities, directors/managers (including owners) benefit more than other groups (Table 2).

**Table 2: Main occupational groups benefiting from skills development.**

**Source: ENSR Enterprise Survey 2003**

Occupational group	Main activity						
	Manufac- turing	Construc- tion	Whole- sale	Retail	Transport/ comm.	Business services	Personal services
Manual, low-skilled workers	23	22	16	16	19	9	18

Semi-skilled (e.g. drivers, machine operators)	39	33	26	23	37	19	22
Technicians, engineers	38	41	30	32	29	40	37
Clerks, admin. personnel	38	34	49	36	49	43	35
Middle manage- ment foremen	29	27	31	25	33	32	25
Managers	62	58	66	58	61	61	57

There is a positive relationship between the size of the enterprise and their involvement in skill development activities. Common reasons for this correlation (e.g. in Denmark) are shown in Table 3, others relate to the access to and experience using modern ICT. Existing CVT within many SMEs fails to take full advantage of the opportunities afforded by ICT, particularly formal training using eLearning. eLearning, through its flexibility and facility of access, is seen as an enabler of life-long-learning, having the potential to transform how and when employees learn to fulfil their work and life needs and as a catalyst for change and integration.

**Table 3: Main reasons for not carrying out formal training activities in Denmark**

**Source: IFKA Copenhagen, 2002**

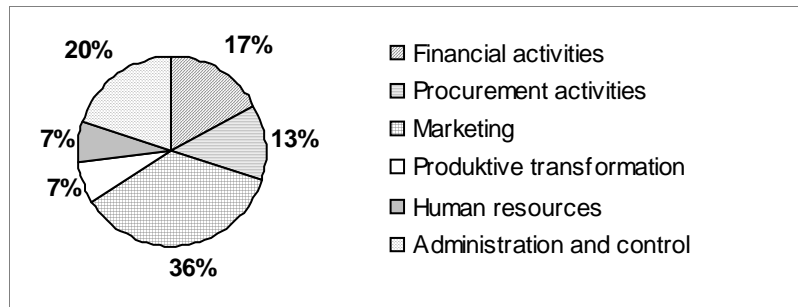
	1-9	10-49	50-199	200+	Average
Insufficient budget	25	25	24	43	30
No relevant courses on the market	17	17	17	5	13
No relevant courses nearby	4	10	10	3	7
Cancelled courses	4	4	12	8	8
Lack of knowledge of the choice of courses	12	4	8	5	7
Lack of motivation with the employees	8	15	5	7	8
Lack of motivation with management	12	13	15	11	13
Lack of time	54	46	63	52	54
Lack of planning	12	10	27	16	18
Lack of guidance	4	6	5	0	4

Many European SMEs do use digital media including CD-ROMs, the Internet and Intranets for accessing technical manuals or for Web searches; but learning takes place only if information is applied in such a way as to develop new mental models and schemas, implicit or tacit which have to be made explicit and shared. CD-ROMs, the Web, etc are useful and convenient ways of storing and retrieving information but if this information is not transformed and context applied it can be seen neither as learning nor knowledge development.

Figure 1 reveals that the Internet is used in SMEs predominantly for advertising of their products (particularly through web sites) and only 7% for human resources development. Some causes of this poor adoption of ICT based training by SMEs are (Hamburg et al., 2007):

- Training culture within the SMEs is often dependent on trainer and conventional training methods; skills needed for a more independent approach and the use of new media for learning are missing. SME managers have not enough knowledge or are not convinced of the effectiveness of eLearning.

- No appropriate software and learning content for SMEs. The major part of commercial eLearning software is modelled on the requirements of big enterprises or higher education and SMEs can not afford to pay for tailor-made solutions. The existing training offered to support specific business needs of SMEs is often inadequate and unattractive. No personalized training facilities are integrated.
- A continuous cooperation between eLearning-developers, -providers (eLearning market) and SMEs which could improve this situation is missing.
- Staff lack time and motivation to test new learning methods. They need to learn fast in the context of their work (just-in-time) so stay with the familiar.

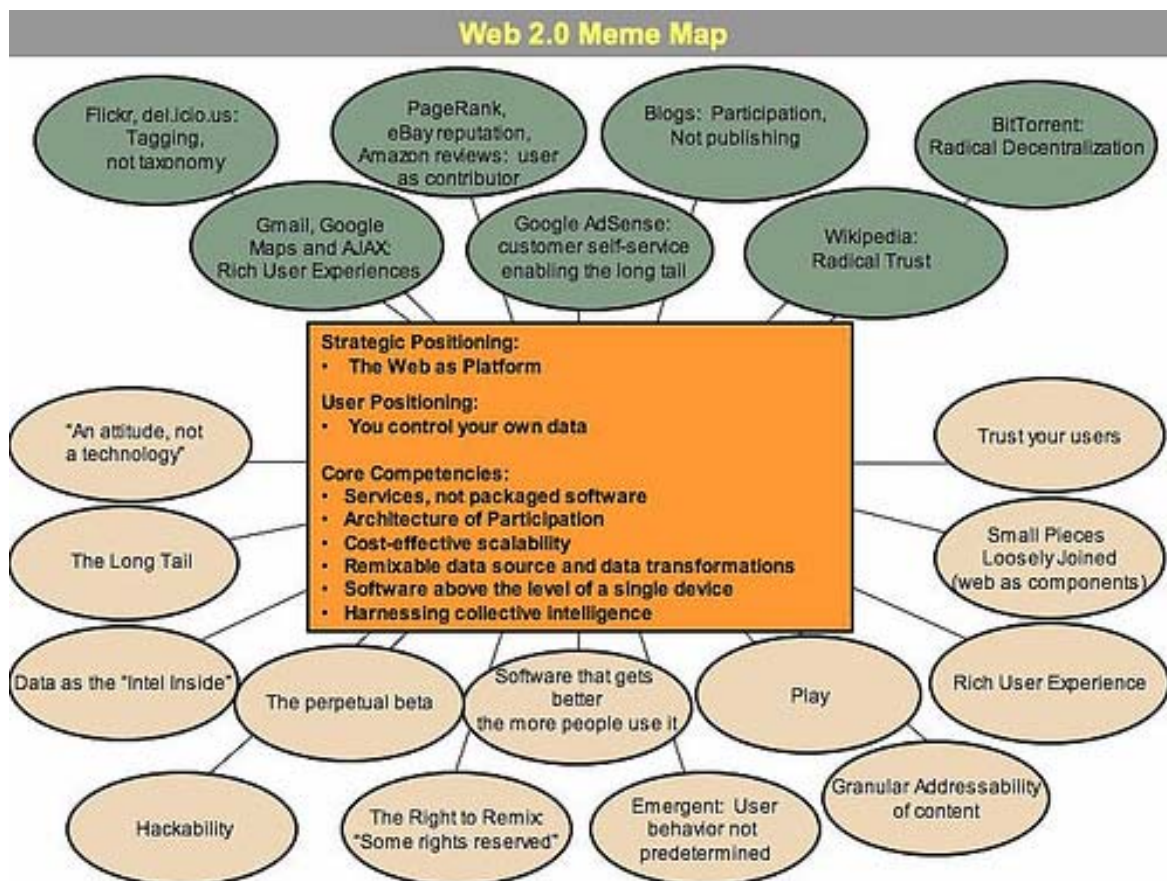


*Fig. 1: Percentage distribution of the use of the Internet among the activities of a company.*

One potential solution is the use of the new generation of eLearning - eLearning 2.0 in combination with the facilities of Web 2.0 (O'Reilly 2005). The concept of "Web 2.0" was born within a conference in 2001 brainstorming session between O'Reilly and MediaLive International. Dale Dougherty, Web pioneer noted that far from having "crashed", the web was more important than ever, supporting new applications and sites and facilitating a new level of interaction that make it easier to collaborate and share information.

Web 2.0 facilitates a new level of interaction that makes it easier to collaborate and share information. Learning by using Web 2.0 (eLearning 2.0) is based on tools that combine ease of creation of content with Web delivery and collaboration, tools such as: Wikis, social networking, bookmarking tools, blogs, add-ins, mash-up. For eLearning 2.0 the driver is the worker, the content can be created by the users, individually or together. Using the familiar tools of Web 2.0 everyone can be a learner-teacher, the barriers to ICT based training are removed.

Web 2.0 doesn't have a hard boundary, but rather, a gravitational core. Web 2.0 can be represented as a set of principles and practices at a varying distance from that core (Fig. 2).



*Fig 2: Core and scope of Web 2.0: the playing field for eLearning 2.0 (Source: Tim O'Reilly, What Is Web 2.0 - Design Patterns and Business Models for the Next Generation of Software (2005))*

eLearning 2.0 with its clear focus on community is ideal for SMEs. It supports natural informal learning by simplifying tasks involved in working and learning in groups. For example: writing in public blogs encourages the writer to think about the issues in question. In communities, an individual will receive help from a network of peers, so unnecessary searching activity and time can be saved. eLearning 2.0 also impacts on formal learning settings being particularly useful for pedagogical approaches such as, collaborative learning and problem and enquiry based learning.

A suitable learning structure for SMEs should be based on delivery of content interactively in small pieces over time as part of a larger process, which corresponds to the needs of SME staff for faster learning in the context of their work, this implies personalisation of learning making it more useful and attractive to the learner. In this respect existing LMS and VLE are deficient; they need to fuse with Web 2.0 to form PLE, personal learning environments. A similar shift is needed by vocational learning institutions to provide a more personal engagement with their learners, through approaches that enable individuals to develop to their full potential and support knowledge development and creativity through the engagement of individuals within social networks and cultural interchange. The communication tools of Web 2.0 enable learners to provide evaluation of courses, exchange ideas and content so supporting the improvement of the quality of learning materials and products and the vocational education process can be transformed in a social one.

Making this kind of transition is not straight forward, help is needed. One of the main tasks of the SIMPEL project<sup>1</sup> discussed in the examples below was to provide appropriate "Guidelines" (Beer et al., 2008). Another approach that we used was to develop scenarios and introduce

<sup>1</sup> [www.simpel-net.eu](http://www.simpel-net.eu)

them within workshops with SMEs managers, staff, trainers and consultants to show them the facilities of Web 2.0 and how to combine elements of each eLearning generation as part of their daily work. Web 2.0 can be effectively used in SMEs for management (planning and formulating for strategies by using actual information, examples from competitors, through professional Blogs with RSS Feeds, etc.), marketing (by using social networks like XING new clients can be found), production (to describe new products/services and to discuss their content by using Wiki or Blogs) and purchasing.

### 3 Informal learning within communities of practice

Communities of practice (CoPs) can become a powerful way for SMEs to innovate and develop new capabilities.

Some main characteristics of CoPs are the following:

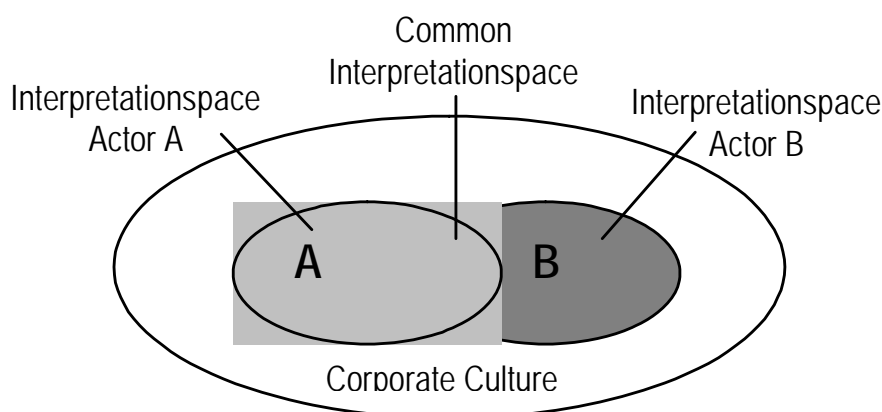
- Shared domain of interest of its members, their commitment to this domain and a shared competence that distinguishes members from other people,
- Common ideas, joint activities. Members engage in pursuing their interest for the domain and build relationships that enable them to learn from each other,
- Common practice because members of a community are practitioners with different levels common practice because members of a community are practitioners with different levels of expertise. They develop a shared repertoire of resources e.g. experiences, tools, ways to solve problems, a knowledge base of best practices.

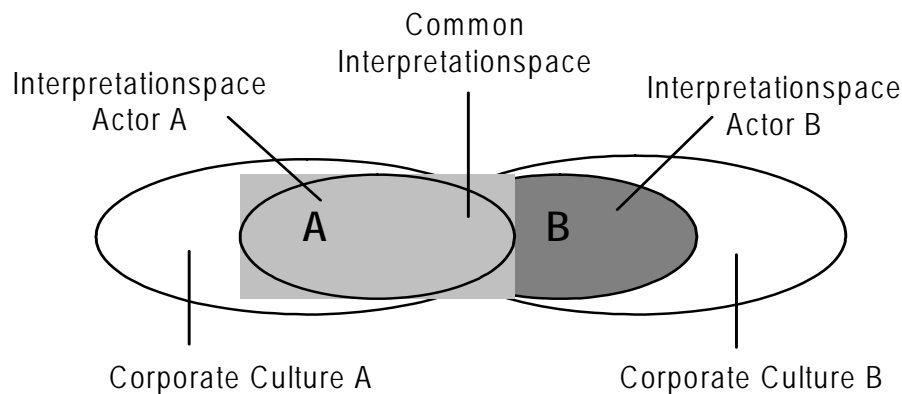
In comparison with technical solutions for knowledge management, CoPs mark a change from “managing knowledge” to “enabling knowledge” within a company and across organizations. “Effective knowledge creation depends on an enabling context. What we mean by enabling context is a shared spaces that fosters emerging relationships” (Krogh et al., 2000). In CoPs the knowledge can be created and used in interdisciplinary and cross-organisational context. CoP can become for SMEs an environment where learning and working are connected. Through their experimentation character they support innovations and contribute to the improvement of a company knowledge base. Figure 3 shows the creation of an “enabling context” in CoPs and differences between company internal and company-cross CoPs. Community work places are also a suitable environment for staff to share ideas, mentor each other and tap into interests. The CoPs should be supported by software which is most familiar with the CoP members.

Thus, CoPs consist of voluntary members who share similar challenges, interact regularly, can learn from and with each other and would like to improve their ability to address the challenges they face.

In comparison with technical solutions for knowledge management, CoPs mark a change from “managing knowledge” to “enabling knowledge” within a company and across organizations.

One important aspect is managing the intersection between formal and informal, Figure 2 shows the creation of an “enabling context” in CoPs.





**Fig. 3:** *Interpretation models for creating an enabling context within a CoP:  
A=within a company, B=cross-companies*

CoPs address not only the acquisition of technical skills for a determined practice but also social and informal aspects of creating and sharing knowledge. Interesting research on this aspect has been carried out in the field of organisational learning, in attempts to explain how personal knowledge and skills become shared in CoPs and organisations, and how new knowledge is developed. Nonaka and Konno (1998) have described a knowledge development cycle showing how tacit or implicit knowledge can be made explicit in learning processes. This work, and others, point out that knowledge developed in CoPs is important for understanding different types of knowledge and how knowledge develops in different contexts. These distinctions are important when processes of learning and knowledge development in SMEs are analysed.

Important also is the design of CoPs, shared learning and interests are what keep CoPs together - they exist as long as participation has value to their members. Some principles of “designing for aliveness”, followed in our current project SIMPEL (see part 4), which can guide organisations wishing to start a CoP are:

- Design for evolution e.g. design elements should be combined in a way that they may act as catalysts for a natural evolution to a life-long learning oriented CoP,
- Keep an open dialog between inside and outside perspectives of the CoP because the latter can help community members to see new possibilities and act effectively,
- Consider different levels of participation for the members of the CoP (leadership roles, core active group, occasional participants, etc.),
- Develop public and private community spaces,
- Create a rhythm and rules for the community.

Communication by ICT extends the interactions within CoPs beyond geographical limitations and makes possible the building of virtual CoPs (VCoP). These communities free their members from constraints of time and space. Sometimes a transition takes place from a face-to-face to a virtual CoP, in order to reach more continuous levels of information sharing. In this case it is important to choose adequate software to support the VCoP.

The current generation of web-based technology (Web 2.0), not mainly a technical revolution but first of all a social one, has a vast potential to create prospering environments for emerging CoPs. Social software lends itself very well for support of activities within a community and for staff of SMEs to collaborate. It is based on the idea of connectivism developed by Siemens (2005) where learning takes place in distributed networks of people, content and services are adaptable and responsive for example to specific needs and goals of SMEs. The lack of face-to-face contact within a CoP can be an advantage, because it helps to suppress traditional

group norm behaviour. On the other hand, a CoP where face-to-face contact is entirely excluded is difficult to sustain over a long period unless all participants are VCoP experienced.

Despite the great potential, there are also limitations of current technologies in relation to VCoPs: because virtual community infrastructure can be set up across cultures via WWW, cultural and language differences can hinder the desired fluidity of activities in communities of practice.

## 4 Examples

We applied the above ideas within the activities of the EU project SIMPEL tracking the suitability and our usage of Web 2.0 and utilising the CoP structure. SIMPEL stands for: SME Improving Practice in eLearning; we developed strategies to enable SMEs to take full advantage of the promise of eLearning in their training. We involved SMEs and eLearning experts in two communities of practice (one European and one German) to share learning and knowledge and to develop continuous vocational education strategies based on eLearning 2.0 leading towards the creation of dynamic PLEs. The European CoP is a loosely coupled (weakly framed) CoP, the German one strongly framed where the transmission of knowledge occurred closely between its members.

In the European CoP an “optimal vocational training model” based on eLearning in SMEs was developed, best practice determined and guidelines for using them written<sup>2</sup>. It attracted sectors engaged in support, training, design/ development, use, and consulting and policy formulation concerning eLearning in SMEs in the European Union.

The following aspects necessary in developing a sustainable vocational training strategy using eLearning, were identified:

- Identification of needs and objectives of training
- Engaging employees
- Time factors and forms of training used including formal and informal ones
- Courses/Learning Content
- Tutor support for e-Learning and integration of it with more traditional forms of learning:
- Learning infrastructures like space, time, climate, etc to support eLearning
- Organisational perspective, transfer of knowledge by using CoPs, learning groups, partnerships supported by learning platforms and special connections
- Economical aspects
- Quality and (self) evaluation criteria.

The German CoPs focused particularly on an analysis and testing how informal, workplace oriented learning can be used efficiently in SMEs. The topic was chosen because analysis shows that individual SME staff show more interest in achieving of competences for things they can do, rather than for certification. The framework of the CoP is useful for informal learning and the social participation of the members is the key for informal learning being embedded into practices and relationships of the workplace, for example: keeping up-to-date with administrative and technical changes necessary to solve the daily tasks efficient, and strategies to help solve problems and communicate with colleagues and co-workers.

This CoP has permanent members who make regular contributions but also occasional members who use the information and knowledge needed and sometimes contribute. For the future it is intended to encourage more SME participants to use the CoP's knowledge and resources developed.

---

<sup>2</sup> See [www.simpel-net.eu/docs/guidelines.pdf](http://www.simpel-net.eu/docs/guidelines.pdf)

## 5 Conclusions

It is clear that communication between members of a learning group is paramount for success in training programmes, whether this communication is part of a formal structure or is informally between colleagues. Tools and structures that aid this communication, such as Web 2.0 and CoPs, contribute to success. SMEs employees are at a disadvantage when it comes to forming learning communities, they are isolated by location and/or occupation. On-line Web 2.0 activity and gathering together in (V)CoPs enables these disadvantages to be overcome and helps SMEs maintain and improve competitiveness in our Global market.

## References

- Attwell, G., Dirckinck-Holmfeld, D., Fabian, P., Kárpáti, A. & Littig, P. (2003). E-learning in Europe - Results and Recommendations. Thematic Monitoring under the LEONARDO DA VINCI Programme. 2003. Bonn, Germany. Report., Impuls 010.
- Averill, S. & Hall, T. (2005). An observatory of eLearning in Small Medium Enterprises (SMEs) in Europe - The Promise versus the Reality. In: Richards, G. (ed.), Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare and Higher Education, (pp.220-225), Chesapeake: VA: AACE.
- Beer, D., Berger K., Busse, T., Engert, S., Hall, T., Hamburg, I., ten Thij, H. (eds.) (2008). Strategies, models, guidelines to use eLearning in SMEs. Duisburg: Universität Verlag.
- Beer, D., Busse, T., Hamburg, I., Mill, U. & Paul, H. (eds.) (2006). e-learning in European SMEs: observations, analyses & forecasting. Münster: Waxmann.
- Beer, D., Busse, T., Hamburg, I. & Oehler, C. (eds.) (2008). Improving eLearning practices in SMEs. Brussels, Proceedings of the SIMPEL final conference. April 14, 2008. Universitas-Győr.
- BMWA (2004). LERNET - ELearning für Mittelstand und öffentliche Verwaltungen. Ein Leitfaden zur erfolgreichen Nutzung und Produktion moderner ELearning-Angebote. Stadt: Verlag.
- Cernian, O. & Hamburg, I. (2006). The role of e-learning and higher education institutions in development of competencies for SMEs in Europe. In: Advances in electrical and computer engineering 6, no. 1, pp. 84-88.
- Cernian, O. & Hamburg, I. (2006). E-Skills in small and medium sized enterprises and the contribution of e-learning. In: E-Comm-Line 2006: 7<sup>th</sup> European Conference on E-Business, E-Commerce, E-Learning, E-Work, E-Government, E-Democracy, E-Health, E-Mediary, E-Inclusion, BB-Broad-Band and On-Line Services, E-Marine, E-Banking and their influences on the economic - social environment and contributions to ERA, September 18-19, 2006, Bucharest, Romania. Bucharest: IPA SA, R&D Inst. for Automation, pp. 7.
- Diemers, D. (2001). Virtual Knowledge Communities. Erfolgreicher Umgang mit Wissen in digitalem Zeitalter. Dissertation der Universität St. Gallen.
- European Commission (2003). Observatory of European SMEs.
- Hamburg, I. (2007). Shifting eLearning in SMEs to a Work-based and Business Oriented Topic. In: European Distance and ELearning Network: New learning 2.0? Emerging digital territories - developing continuities - new divides; THE EDEN, Annual Conference. June 13-16, 2007. Naples: CD-ROM. Budapest: EDEN, pp. 4.
- Hamburg, I. & Engert, S. (2007). Competency-based Training in SMEs: The Role of ELearning and E-Competence. Proceedings of the 6th IASTED International Conference "Web-based Education", March 14-16, 2007. Chamonix, France. Anaheim: Acta Press, pp. 189-193.
- Hamburg, I., Engert, S., Petschenka, A. & Marin, M. (2008). Improving e-learning 2.0-based training strategies on SMEs through communities of practice. In: The International Association of Science and Technology for Development: The Seventh IASTED International Conference on Web-Based Education, March 17-19, 2008, Innsbruck, Austria. Innsbruck, pp. 200-205.
- Lewin, K. (2005). Chris Argyris: Theories of action, double-loop learning and organizational learning.
- Krogh, G., Ichijo, K. Nonaka, I. (2000). Enabling Knowledge Creation. How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation. New York. Oxford University Press, pp. 7.

Nonaka, I. & Konno, N. (1998). The concept of 'ba': building a foundation for knowledge creation, California Management Review, 40(3), pp. 40-54.

OECD (2005). ELearning in tertiary Education: Where do we stand? OECD. Paris.

O'Brien, E. & Hall, T. (2004). Authoring e-learning through Training Needs Analysis - Identifying relevant content. ED-Media 2004 AACE, World Conference on Educational Multimedia, Hypermedia & Telecommunications, Lugano, Switzerland.

O'Brien, E., Hall, T. & Johnson, K. (2008). The Importance of Training Needs Analysis in Authoring Technology Enhanced Learning for Companies. In: Technology Enhanced. Learning Tools (ed), Lytras, Gasevic and de Pablos IGI Global publication.

O'Reilly, T. (2005): What is Web 2.0. Design patterns and Business models for the next generation of Software. <http://www.oreillynet.com/lp/a/6228>.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. International Journal of Instructional Technology and Distance Learning [http://www.idtl.org/Journal/Jam\\_05/article01.htm](http://www.idtl.org/Journal/Jam_05/article01.htm)

Wenger, E., McDermott, R. & Sydner, W. (2002). Cultivating communities of practice: a guide to managing knowledge. Boston: Harvard Business School Press.

## Authors



**Timothy Hall**

Professor (honoris causa) Stefan cel Mare University, Suceava, Romania.  
Director, EMRC-Educational Media Research Centre, University of Limerick,  
Ireland  
[timothy.hall@ul.ie](mailto:timothy.hall@ul.ie)



**Dr. Ileana Hamburg**

Senior Researcher  
Institute for Work & Technology, University of Applied Sciences Gelsenkirchen,  
Germany.  
[hamburg@iat.eu](mailto:hamburg@iat.eu)

## Copyrights



The texts published in this journal, unless otherwise indicated, are subject to a **Creative Commons Attribution-NonCommercial-NoDerivativeWorks 2.5 licence**.

They may be copied, distributed and broadcast provided that the author and the e-journal that publishes them, eLearning Papers, are cited. Commercial use and derivative works are not permitted. The full licence can be consulted on <http://creativecommons.org/licenses/by-nc-nd/2.5/>

## Edition and production

Name of the publication: eLearning Papers

ISSN: 1887-1542

Publisher: [elearningeuropa.info](http://elearningeuropa.info)

Edited by: P.A.U. Education, S.L.

Postal address: C/ Muntaner 262, 3º, 08021 Barcelona, Spain

Telephone: +34 933 670 400

Email: [editorial@elearningeuropa.info](mailto:editorial@elearningeuropa.info)

Internet: [www.elearningpapers.eu](http://www.elearningpapers.eu)