

# Successful E-learning in Small and Medium-sized Enterprises

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## Abstract

So far, e-learning has primarily been used when there are many learners involved. The up-front investments related to e-learning are relatively high, and may be perceived as prohibitive for small and medium-sized enterprises (SMEs). Some e-learning is, however, getting less expensive, and some e-learning models are more suited for small-scale training than others. Therefore, this article presents some e-learning experiences derived from case studies of eighteen enterprises in eight European countries. The case studies represent small, medium-sized and large enterprises as well as e-learning providers. The analysis suggests that SMEs could use e-learning successfully based on three different types of courses: Generic courses, sector courses and internal courses. The small enterprises have so few employees that they are most likely to enrol individual students in generic courses. The medium-sized enterprises may also benefit from more specialized sector courses offered through a branch association or in cooperation with suppliers or chains. Large enterprises may have enough resources to develop e-learning courses internally. The e-learning providers are SMEs that may be especially interesting as examples of how other enterprises may use e-learning in the future. The article concludes with a number of success factors and advantages with e-learning in SMEs.

## Keywords

E-learning, online education, SME, Small and medium-sized enterprises, success factors.

## List of topics

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## Introduction

This article presents some of the results from the European ELQ-SME project which was supported by the Leonardo da Vinci Programme from 2005 to 2007. The seven project partners are: CECOA – Vocational Training Centre for the Trade in Portugal, BFI - Austria Berufsförderungsinstitut in Austria, Forschungsinstitut Betriebliche Bildung (f-bb) in Germany, Open University Centre at the University of Tartu in Estonia, Confederació de Comerç de Catalunya in Spain, ProfitWise in the Netherlands, and NKI Distance Education in Norway. More information about the project and its outcome is available at [http://www.nettskolen.com/in\\_english/elq-sme/](http://www.nettskolen.com/in_english/elq-sme/).

So far, e-learning has primarily been used when there are many learners involved. The reason may be quite simple; the up-front investments related to e-learning are relatively high. Therefore it is necessary to distribute e-learning investments among a relatively large number of learners. The consequence is that e-learning first and foremost has been used by individuals who enrol in generic courses in a large open market and by large enterprises with so many employees that they can afford to develop specialized e-learning internally.

According to the European Commission (2003) SMEs are enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding € 50 million. Since SMEs have relatively few employees, few SMEs have much experience with e-learning.

Some e-learning is, however, getting less expensive, and some e-learning models are more suited for small-scale training than others. Therefore, this article presents a variety of cases about e-learning experiences in European enterprises. The article also analyses the cases with the intention of presenting e-learning experiences that could be useful and interesting for SMEs. Therefore, the final part of the article presents a number of indicators of success and quality with regard to e-learning in SMEs.

The following seven e-learning advantages are especially pointed out in the case descriptions:

1. Improved flexibility in time and location
2. Reduced costs for travel, accommodation and seminar rooms
3. Swifter and cheaper distribution of learning material
4. Quicker introduction of new products due to accelerated training of many employees
5. Increased sales because customers perceive e-learning as a sign of high competence and added value to the product
6. Improved relations with customers and suppliers
7. Positive organizational effects

The project partners quickly experienced that it was harder than expected to find good e-learning cases that were relevant for SMEs. However, it was relatively easy to find interesting cases in which employees were

enrolled in commercial e-learning courses on the open market. It was also easy to find large enterprises with e-learning experiences.

Eventually, the project partners chose and developed the eighteen case descriptions that are described in this article and published in the full project report (Paulsen and Vieira 2006). Shorter versions of the book are also available in Spanish, Portuguese, German, Estonian and Norwegian via [http://nettskolen.nki.no/in\\_english/elq-sme/workpackage1.html](http://nettskolen.nki.no/in_english/elq-sme/workpackage1.html). The eighteen cases include small enterprises, medium-sized enterprises, large enterprises and e-learning providers. They also represent a broad spectrum of enterprises with regard to business sector and country. But they all have characteristics and experiences that could be valuable for SMEs that are venturing into e-learning.

## Analysis of the Case Descriptions

The partners developed a common template for the case descriptions. Each partner was responsible for finding and choosing at least two relevant cases within their geographical area. The revenue, the number of employees and the number of e-learners vary a lot between the enterprises in the case studies. It was therefore useful to divide them into the following four categories:

1. The small enterprises include the following seven cases: A-punkt; Elektro-Biergans, Infocut, Medilabor, Tuca Informática, Librería Álvarez and Kometter-Kasca.
2. The medium-sized enterprises comprise these five cases: Balti Investeeringute Grupi Pank – BIG, Associação Nacional de Farmácias, Interpolis, Rabobank and Golf supermarkets.
3. The large enterprises consist of three cases: KPMG, York Refrigeration and Roche Diagnostics.
4. The e-learning providers include these three cases: NKI, ETraining OÜ and CINEL.

The small enterprises have so few employees that they are most likely to enrol individual students in generic, commercial online courses. The medium-sized enterprises may also benefit from more specialized courses offered through a branch association or in cooperation with suppliers or chains. Large enterprises may have enough resources to develop e-learning courses internally. The e-learning providers are SMEs that may be especially interesting as examples of how other enterprises may use e-learning in the future.

Key characteristics of the enterprises and their use of e-learning are listed in Table 1 and commented in the following:

The eighteen enterprises represent the following eight countries: Germany (2), Portugal (4), Spain (2), Austria (2), Estonia (2), The Netherlands (3), Norway (2), and Denmark (1). The NACE codes ([http://ec.europa.eu/comm/competition/mergers/cases/index/nace\\_all.html](http://ec.europa.eu/comm/competition/mergers/cases/index/nace_all.html)), which identify the business sector of SMEs, show that most of the SMEs come from the sales and service sectors.

All but three enterprises have five or less years of experience with e-learning. The three exceptions that have more than five years of experience are NKI, York and Elektro-Biergans. Eight of the eighteen cases use blended learning, the remaining ten use online education without face-to-face meetings.

External providers of e-learning services hosted all but three of the e-learning platforms used in the cases. The only exceptions were the e-learning providers that offer such services themselves.

The majority of the cases report that the courses provided access to online teachers. The courses that not provided access to online teachers had relatively many employees involved. So, one explanation could be that access to tutors is reduced when the number of online learners increases. The cases also show that students can communicate with each other online in the majority of the courses. The analyses also showed that:

1. Twelve of the enterprises used generic courses offered on the open market.
2. Three of the enterprises used sector courses developed by associations or cooperating partners.
3. Three of the enterprises used internal courses developed by the SME with some help from external providers of e-learning services.

The cases show that there is a wide range of course topics that can be used successfully in e-learning. The generic courses offered on the open market included project management, office management, Microsoft applications, ICT and language courses. The sector courses and internal courses were much more specialized and related to the special needs of the sector or institution.

**Table 1.** Key information from the case studies sorted by enterprise category

Enterprise category	Name of enterprise	Country	NACE	Revenue in € M in 2005	Number of employees	Number of e-learners	E-learning experience since	Form	Host	E-learning platform
Small	A-punkt	De	O93	0.4	5	3	2004	Blended	External	Bw
Small	Elektro-Biergans	De	G52	1.1	12	1	1999	Online	External	Miner
Small	Infocut	Pt	G52	0.3	5	1	2003	Blended	External	Blac
Small	Medilabor	Pt		1.1	19	1	2006	Blended	External	Blac
Small	Tuca Informática	Es	G52	NA	3	1	2005	Online	External	Ed
Small	Librería Álvarez	Es	G52	NA	4	1	2005	Online	External	Ed
Small	Kometter-Kasca	At		NA	1	1	2003	Blended	External	Un

Medium	BIG	Ee		34.3	101	22	2004	Blended	External	W
Medium	ANF	Pt	G52	NA	140	158	2004	Online	External	Anfor Intn
Medium	Interpolis	Nl	G52	<50	<100		2003	Online	External	Un
Medium	Rabobank	Nl		NA	<300		NA	Online	External	Un
Medium	Golff	Nl		<50	<1800		2006	Online	External	Un
Large	KPMG Norway	No	K74	NA	700	300	NA	Online	External	SE
Large	York	Dk	DK29	NA	220	100	1990s	Blended	External	Ai
Large	Roche Diagnostics	At		NA	250	200	2002	Blended	External	SI
Provider	NKI	No		24.3	145	145	1986	Online	Internal	SE
Provider	ETraining OÜ	Ee	G52	0.2	20	20	2003	Online	Internal	Web
Provider	CINEL	Pt		NA	60	750	2001	Blended	Internal	Self-d

Course type: G = generic courses, S = sector course, I = internal courses

## Small Enterprises

The enterprises in this category have between 1 and 19 employees. All cases, except from the A-punkt case, describe the e-learning experiences of one individual employee. The cases indicate that small enterprises primarily utilize e-learning as a flexible way of providing training and further education for their employees. These SMEs have so few employees that they are most likely to enrol individual students in generic commercial online courses that are relevant to their job performance (project management, office management, business English, Microsoft Word). Key people in a SME may also use e-learning for further education (online master program).

One important observation is that none of the courses were paid for by the enterprises. The courses were either paid by the individuals taking the course or by external funds.

The case descriptions in this category are A-punkt, Elektro-Biergens, Infocut, Medilabor, Tuca Informática, Librería Álvarez and Kometter-Kasca.

A-punkt is a German architecture firm with three employees. One employee and two employers enrolled in a project management course, which is designed for employees in a firm. The course was a combination of e-learning using bbw-online and three days of classroom learning. From a group of about 20, around 18 managed to complete the eight-month course. The satisfaction of A-punkt was really high. The course was promoted and financed by the State Ministry of Employment and Social Security.

Elektro-Biergens is a German company that provides electric installations. The company has 12 employees. The office manager enrolled in an online education program for office management. In the beginning there were about 30 participants in the class that was conducted completely online via the Minerva e-learning platform. The office manager was really satisfied with the course. The course was supported financially by North-Rhine/Westphalia and the European Union.

Infocut is a software commercialization and maintenance company in Portugal with 5 employees. The company's customers are mainly primary and secondary schools. The company's CEO was one of the 143 students who attended a master program in Educational Technology. The program was offered by the Portuguese Catholic University as a combination of face-to-face meetings and e-learning via the Blackboard LMS system. He paid the tuition himself, and he is now developing his thesis. He considered e-learning a good method for learning technical competencies, however, for soft skills he thinks traditional training would be more efficient.

Medilabor is a Portuguese company rendering Health and Safety services to enterprises. The company has 19 employees. One of the training technicians enrolled in an e-learning awareness course offered by AprendernaNet. She paid the tuition herself. The course was a combination of training sessions in class and synchronous and asynchronous sessions on the Blackboard e-learning platform. There were 21 participants who started the course which lasted 17 days. At the end, the Medilabor employee was very satisfied with the results and decided to continue with a second course.

Librería Álvarez is a bookshop in Spain with four employees. The proprietor chose a commercial e-learning course to learn Microsoft Word. The course was made up of a series of lessons and a final assessment test. Each lesson consisted of an explanatory text and exercises to be carried out. There was a tutor available for queries and a chat room for students. The course fully met Librería Álvarez' expectations. The course was subsidized by a state-run institution (<http://www.fundaciontripartita.org>) responsible for promoting and coordinating Spanish policies on Lifelong learning – through an agreement signed between the Spanish Booksellers' Guild and the e-learning provider Editrain .

Tuca Informática is a small Spanish retail company selling computer products and advisory services. It has three employees. One of the employees enrolled in a Business English course that was conducted

completely online. She completed the course and it met her expectations. A teacher assessed the student work and there was a discussion forum for the students. The course was subsidized by Fundación Tripartita para la Formación en el Empleo (Foundation for the Vocational Training) and Fondo Social Europeo (European Social Fund) (<http://www.fundaciontripartita.org>), two organisations that promote the Spanish policies on Lifelong learning. This training was organised in a Project financed by Confederación Española de Comercio and developed by Confederación de Comercio de Cataluña. The course was provided by the training centre Editrain .

Kometter-Kasca is a personal enterprise focusing on adult education in information technology. The owner enrolled in a five-module course to obtain Microsoft Office certification. The training was a personal investment used to set up the enterprise.

### Effects and Outcomes

The reported completion rates in these cases seem to be relatively high:

- Infocut: 119 out of 143 completed the course
- Medilabor: 18 out of 21 completed
- A-punkt: 18 out of 20 completed
- Elektro-Biergans: 15 out of 30 completed
- Tuca Informática: The employee completed the 2 courses
- Librería Álvarez: The proprietor completed the course
- Kommeter-Kasca: 12 people enrolled

One reason for the relatively high completion rates may be that the employees were internally motivated to enrol in these courses. Most of the employees decided themselves that they wanted to enrol in the specific courses. Several of them even paid the tuition fee themselves.

The analysis further indicated that the employees were satisfied with their e-learning courses. The case descriptions include terms such as: high satisfaction, the course met the expectations and the experiences were better than expected.

### Challenges and Barriers

The major obstacle for Infocut was a deficient information policy regarding e-learning for SMEs and the challenge of overcoming resistance to e-learning among employees.

Medilabor points out the need for digital literacy and more content in national languages. There is also insufficient knowledge of and adaptation to real needs and expectations of trainees. Lack of human interaction within the e-learning system is also a barrier.

The major obstacle is, according to A-punkt, that face-to-face meetings are not flexible time- and location-wise.

Elektro-Biergans claimed that the major obstacles are deficient policy regarding e-learning, absence of contact partners, complicated adjustments to technical possibilities, and unsuitable workplaces for undisturbed learning. Other challenges were lack of e-learning competency among tutors and course-length (1.5 years).

### E-learning Features and Success Factors

For small enterprises it is important that e-learning is flexible with regard to time and location since there are few colleagues to take over the work for those who are absent. To be successful, e-learning must be motivating as well as relevant and useful to the daily work and tasks in the company. Motivation may be improved by use of multimedia, occasional face-to-face meetings, certificates and external financing.

### Costs

The Elektro-Biergans course was paid in full by North-Rhine/Westphalia and European Union funding. For the employees at Tuca Informática, Librería Álvarez and A-punkt, the courses were fully financed by the state and free of charge for the students. The employees at Medilabor and Infocut paid all costs themselves. The Infocut employee states that some sectors require compulsory training. E-learning can provide cost reductions regarding transportation expenses, less need to be out of office and a long list of courses to choose from.

### Medium-sized Enterprises

Medium-sized enterprises have more employees, more resources and probably more e-learning options than small enterprises. However, so far it seems like few medium-sized enterprises have chosen to develop e-learning solutions by themselves. They seem to rely on external support.

Just as small enterprises do, medium-sized enterprises can send groups of employees to standard e-learning courses that are offered on the open market such as the Balti Investeeringute Grupi Pank – BIG has done. However, they may also benefit from more specialized courses offered through a branch association such as The National Pharmacy Association. The third interesting option is that they can conduct e-learning in cooperation with suppliers such as the Interpolis insurance company and Prisma Food Retail and with chain members such as Rabobank intermediaries and Goffl supermarkets. The suppliers may create more loyal and competent retailers by giving them access to e-learning. Cooperation through associations or chains makes sense because the enterprises may save money by splitting the costs between the partners.

Balti Investeeringute Grupi Pank – BIG has 101 employees in Estonia. Two study groups with a total number of 22 employees were involved in the blended learning course Credit Management. The first module was about private loans; the second was about business loans. The course is among the standard credit courses offered by the Estonian e-University via its WebCT e-learning platform. The course is based on two printed textbooks and a number of online tools within WebCT. Learning groups start four times a year, and the course duration is 6 months.

Associação Nacional de Farmácias, the National Pharmacy Association (ANF) in Portugal, was established in 1975 with the aim of supporting the interests of pharmacists. ANF represents almost all the pharmacies in Portugal, although membership in the association is optional. The association provides two e-learning courses. The first course, Gastroesophageal Refluxes and Peptic Ulcer Disease, enrolled 146 trainees. The second course, Vaginal Infections, enrolled 12 participants. The course content is available in HTML, and it includes animations and interactivity in a Flash format and documents that can be printed in pdf format. Communication between trainers and trainees is supported through chat, discussion forums and e-mail.

Interpolis is a large insurance company in the Netherlands that offers an online course for prevention officers in SMEs. According to the EU Framework Directive (89/ 391/EEG), all businesses in the Netherlands must appoint an employee as prevention officer with the task of protecting against occupational risks. The compulsory training the prevention officers need is a major challenge for many SMEs. They don't want to close their business for one or two days. There is simply no time for it. The online course makes it possible for the SME employees to complete the course without leaving work. The online course takes about two hours to complete, and the participants receive a recognized certificate if they complete the course successfully. So far at least 4000 people have taken part in the training and the introduction to the program appears to have been a success.

Rabobank is a coalition of independent financial intermediaries that can be viewed as SMEs, which have a total of 4000 employees in the Netherlands. According to the Financial Services Act, the intermediaries may only provide their services if they possess a license and demonstrable expertise. Rabobank is also an important distribution channel for the Interpolis insurance company. Interpolis ensures that the intermediaries fulfil the requirements in the Financial Services Act, and it regards training as a tool for adding value to its products. Interpolis has accelerated the introduction of a new life insurance policy through an e-learning insurance course developed for its intermediaries. So far, 4100 participants have followed the course and 10 000 policies have been sold. The course resulted in additional sales and considerable shorter time to market for the new insurance.

Golff supermarkets are run by independent entrepreneurs. They purchase goods and services from Prisma Food Retail, but they are free to purchase from other providers as well. Most of the entrepreneurs have set up a private company with limited liability. The companies can be labelled as SMEs. In 2005 the entrepreneurs initiated the e-BEAT e-learning initiative that was mediated by Prisma. By mid May 2006, 300 of the 1800 people working in the Golff supermarkets had taken part in the course Introduction to Working at Golff. The introductory course will be followed by two more e-learning courses: Golff Rules and Golff Marketing. The Golff entrepreneurs all have a broadband Internet connection and a separate computer the employees can use to follow the courses. It is expected that each Golff entrepreneur will save about € 1500 per course. The introduction of the program has appeared to be a reasonable success.

### Effects and Outcomes

The Balti Investeeringute Grupi Pank – BIG reports that their completion rate was 73 percent. Golff informs that the system generates progress reports. Information about completion rates at ANF, Interpolis and Rabobank is not available.

The case from Balti Investeeringute Grupi Pank – BIG includes the results from a survey on student satisfaction. From the institution's point of view, it benefits a lot from e-learning because the company has employees in several regions in Estonia. Bringing employees together to one classroom would consume a lot of valuable working time.

ANF reports a high level of satisfaction. Information about satisfaction levels at Golff, Interpolis and Rabobank is not available.

### Challenges and Barriers

There was a wide range of challenges and barriers mentioned in the case descriptions. Just a few common issues are listed here:

- The training is financed by BIG Ltd and it is free of charge for the employees. If they fail an examination, they have to pay the second attempt themselves.
- Availability of Internet with the correct browser
- Language barriers
- Uncertainty if course content matched the legal requirements
- Management commitment
- Acceptance problems among employees aged 35 to 45

### E-learning Features and Success Factors

E-learning can reach and connect geographically dispersed groups and hence reduce travel time and cost. Furthermore, schedule flexibility makes it possible to reduce cost related to absence from work. E-learning also has logistic advantages. It is swifter and easier to distribute digital course material than printed material. This may increase its competitive strength because of accelerated time to market.

Certification may be very useful. Both Interpolis and Rabobank emphasise the importance of obtaining a validation from an external certifying body. Golff maintains that it is an advantage to offer electronically printed certificates via HTML.

Support from managers and internal e-learning competency are also mentioned as a success factors.

Finally, successful e-learning should build on practical, in-depth and up-to-date knowledge of the subject area as well as suitable models and technology. This may include initial training to become familiar with the e-learning platform and the people involved with the course.

### Costs

The Interpolis, Rabobank and Golff cases all argue that the enterprises experience substantial savings from their e-learning projects.

As BIG Ltd does not develop and implement training courses itself, the course fee is the only investment. The fee was € 226, that is € 37 per ECTS credit point. The company claims that it is cost-effective for small

enterprises to purchase courses externally, instead of developing courses themselves. BIG Ltd covers the expenses of the training and correspondingly employees have the obligation to work for the company for next 12 months. If employees choose to quit earlier, they must reimburse the expenses (proportional to time spent in the company). This is an effective restraint, but in reality BIG Ltd has considered every case individually.

## Large Enterprises

The enterprises in the large enterprise category are too large to qualify as SMEs. But large SMEs can benefit from the experiences made by KPMG Norway, York Refrigeration in Denmark, and Roche Diagnostics in Austria. All three enterprises have enough resources to develop most of their e-learning content internally. They may have some external help with development of graphics, video and web adaptation, but the internal employees are the content experts since the course topics focus on expert knowledge related to the companies' core products and services. The e-learning platform is not a part of the companies' core business, so the companies buy LMS services from external hosts.

KPMG Norway is a separate and independent legal entity in the global KPMG network of professional firms providing audit, tax and advisory services. The firm has about 400 employees throughout Norway. KPMG's first online course, Bookkeeping Legislation, enrolled 280 employees and 219 passed the final online test. The course comprised four modules and each module consisted of a set of online readings and multiple choice and fill-in assignments. The second online course, Flotation and Capital Increase, enrolled 155 employees and 102 passed the final online test. The courses were developed especially for KPMG employees by KPMG in collaboration with NKI Distance Education. The online courses were based on the SCORM e-learning standard and offered through SESAM, an LMS system developed and hosted by NKI. KPMG had no direct investment costs related to e-learning since the courses were hosted by NKI, but KPMG used some internal resources to develop the course content. KPMG employees saved time and travel since the courses were offered as e-learning instead of face-to-face seminars.

York Refrigeration is a Danish subsidiary of York International Corporation, a global concern within heating, ventilation and refrigeration. The company has 220 employees in Denmark. It uses web-based e-learning in conjunction with classroom and workshop training as individual learning and as manuals and documentation. Altogether 300- 400 employees and customers have used one or more of the about 15 e-learning modules that have been developed. Most of the course development is done internally, but some video and graphics are made externally. The course administration is minimal since all e-learning is available to all employees all the time. This means that the courses require no enrolment procedures, tuition fees, examination procedures etc. The course content is hosted externally in the content management system Media Builder from Arkena (<http://www.arkena.com>). York perceives the e-learning initiative as very inexpensive.

Roche Diagnostics has 250 employees in Austria. It is affiliated with Roche, which is a large international healthcare company. Roche's Diagnostics Division, which claims to be the world leader in in-vitro diagnostics, offers a wide range of products and services in all fields of medical testing. The company uses in-house e-learning to certify and document that the employees fulfil the quality requirements for producing diagnostic devices. The course content is primarily developed in-house and offered through the SITOS e-learning platform. The courses consist of a number of learning objects, which have an average machine time of 30 minutes. Typical course duration is twelve hours. About 200 of the employees have experience with e-learning activities.

## Effects and Outcomes

### Completion rates

KPMG reported that 219 out of 280 employees completed all modules and passed the final online test in the first course. In the second course, 102 out of 155 employees completed all modules and passed the final online test.

Roche reported that 150 employees have completed. Completion rates for York are not applicable since the courses are available all the time and often used as documentation. There are no tests.

### Satisfaction

The feedback from Roche employees is predominantly positive. At York there has not been any systematic evaluation of measurable effects. KPMG has received limited feedback from employees.

### Challenges and Barriers

At Roche, there were some initial technical problems, and there should have been better information before the introduction of the system.

The major challenge at KPMG was to get the organization to see all the opportunities that lie in distance learning.

York reports that availability of technology is still a central barrier. Further, there still is a challenge to find acceptance for e-learning in the organization.

## E-learning Features and Success Factors

KPMG focuses on the necessity to find the right balance between e-learning and other training activities. The company argues that e-learning is flexible time- and location-wise and that it is efficient regarding travel cost and time. Further, the courses are nearly compulsory since the knowledge of the course content is essential to the employees, and they are required to spend a certain number of hours on training to maintain their licence.

At York, multimedia content is successful because it supports a more visual learning style efficiently. E-learning has resulted in better internal communication and broader understanding of York offerings. The company has further experienced that e-learning content can have high importance in sales negotiations and that it has had a positive effect by giving the employees a common experience to build on.

At Roche, e-learning has made it possible to confine co-operation between clients and contractor. It is recommended that the introduction of e-learning should be well planned. The case study finally maintains

that e-learning must be obligatory to become a success.

### Costs

KPMG has not had direct e-learning investment since the entire system and e-learning courses are hosted, converted to web and maintained by NKI. Some costs related to the development of the course material may exist. In the early stages of negotiations the partners agreed on a fixed price for the NKI course development based on one sample course representative for the KPMG course portfolio. In addition a student fee and a start-up fee were set.

At York, the e-learning initiative is perceived as very inexpensive. The aim has been to minimize the development cost, and the interviewees consider the investments to be minor compared to the outcome.

Roche reports that licence costs of the learning platform were about € 20 000, hardware costs were about € 2000 and development costs were about € 30 000.

## E-learning Providers

Many European providers of education and training are SMEs that offer e-learning courses and services. These institutions may be increasingly dependent on e-learning to survive. They may also be especially interesting as examples of how other enterprises may use e-learning in the future. The providers of e-learning are probably more prone to use e-learning than other enterprises since they are especially aware of the opportunities and since they have modest additional costs for internal use of existing e-learning courses and services. The analysis includes case descriptions of the three e-learning providers. The ETraining OÜ and NKI cases focus on using their generic courses for training their own employees. The CINEL case primarily describes the company's experience with external students.

NKI is a major provider of distance and online education in Norway. The institution claims that it was the first European online college and it has offered online education since 1986. Since then, NKI has registered more than 100 000 enrolments in online courses. About 75 percent of NKI Distance Education students are online students. NKI has about 450 online courses, 9000 online students and 150 part-time online teachers. The NKI group has about 145 full-time employees. Over a period of 20 years, about 150 NKI employees have enrolled in various online courses provided by NKI. The employees have primarily enrolled in three categories of e-learning courses. Most NKI tutors have completed the obligatory course Tutor in Distance Education. A number of employees have made more than 50 enrolments in various competence-development courses at the initiative of the NKI management. Finally, about 15 employees have made more than 50 course enrolments on their own initiative in a broad spectrum of courses. The cost of providing the courses to NKI employees has been low, since the institution also provides and sells all the courses on the open market. The courses are offered via the SESAM e-learning platform developed by NKI.

ETraining OÜ is a commercial provider of online education services and courses in Estonia. The course topics are primarily related to ICT. The online education services are related to online tests and the WebTrainer e-learning platform, which is developed by ETraining OÜ. The company has 20 employees. For two years it has used its own courses and solutions for training and testing. All eTraining employees must go through certain courses and pass all related tests before they are allowed to start service or sales. The costs are relatively small since the institution uses its own content and services for training.

CINEL is a vocational training centre for the electricity industry in Portugal. The centre has 60 employees. It offers online courses that are open to the general public but with a focus on employees in the electricity industry. The centre has offered an English Online Multimedia course for six years, and during these years 720 trainees have graduated from the course. CINEL paid for internal and young students. The price for external students is € 100 per level and € 250 for students with electronic technician level/profile. In addition the centre has received grants from the European Equal program to offer three courses in domestic issues, computer science and business start-up courses as blended learning. These three courses have been attended by 32 trainees, eleven of whom were either blind or had other special needs. The courses are offered via an e-learning platform developed by CINEL collaborators.

### Effects and Outcomes

#### Completion rates

NKI reports that completion rates vary between the three different categories of courses. The course Tutor in distance education seems to have the highest completion rate since it is a prerequisite to become an online tutor at NKI. The courses that the students enrolled in on their own initiative also have rather high completion rates. The courses initiated by the management seem on the average to have a lower completion rate. Differences in completion rates relate mainly to differences in motivation of the participants.

At ETraining OÜ, 55% of the participants passed the test on their first attempt, 93% on their second attempt. CINEL reports that 720 have graduated from the English course in the past 6 years. Only 12 dropped out, and 10 didn't finish on their first attempt.

#### Satisfaction

NKI has not conducted systematic evaluation among its employees, but provides positive testimonials from individuals. ETraining OÜ states that it has not discovered negative feedback. Employees like the simplicity of the learning cycle. CINEL claims that there is total satisfaction.

#### Challenges and Barriers

NKI reports that technical barriers are quit low, but employees need to negotiate with their supervisors if they want to study during work hours. But there is pressure on personnel resources, so it is often difficult for many to find time, even when time for study is agreed upon.

ETraining OÜ states that the company is too small to have sufficient resources to produce interactive training content for internal use. CINEL claims that people don't take e-learning seriously.

### E-learning Features and Success Factors

Among the success factors mentioned by the e-learning providers are:

- Motivated employees and management support.
- Opportunities to study during work hours.
- Courses relevant to their daily work or personal interests.
- Courses will result in promotions or better payment.

### Costs

NKI claims that the cost of e-learning is low since the institution itself offers the courses on the open market. The CINEL costs are exclusively related to course creation. ETraining OÜ states that information about investments and production costs is not public. The operational cost is about € 30 for web hosting and 5 hours of work per month.

### Conclusions: Success and Quality in E-learning for SMEs

The research and analysis presented in this article suggests that SMEs could use e-learning successfully based on three different types of courses:

1. *Generic courses* offered on the open market. This model should be suitable for all SMEs because it does not incur any internal costs related to course development or investments in e-learning systems. One pitfall however is that employees who study generic courses could use the course qualifications to apply for a job in another company. Addressing this challenge, BIG employees have the obligation to work for the company for 12 months after finishing the course.
2. *Sector courses* developed by associations or cooperating partners. This model should be suitable for all SMEs because the developmental and operational costs could be divided among a number of SMEs. The model may also result in improved relations between the enterprises in associations, branches or value chains.
3. *Internal courses* developed by the SME with some help from external providers of e-learning services. This model is primarily suitable for large SMEs that have the necessary competence and resources internally. The employees are usually the content experts since the course topics often focus on expert knowledge related to the companies' core products and services. The e-learning platform is not a part of the companies' core business, so the companies often buy these services from external hosts.

### Indicators of Quality

According to Rekkedal (2006), important criteria for judging the quality of e-learning programmes are:

- Credibility of the institution offering e-learning
- Quality assurance or quality management systems
- Pre-enrolment information and guidance
- Course costs
- Support for the e-learner
- Individual preferences

These criteria are obviously useful for SMEs that judge the quality of generic courses on the open market. But the criteria should also apply to sector courses and internal courses. One may question however, whether SMEs are likely to set the same standards for themselves as they do for external providers of e-learning.

### E-learning Features

The analyses of the eighteen cases suggest that the following seven e-learning features are perceived as advantages by the SMEs:

1. *Flexibility in time and place.* For small enterprises it is important that e-learning is flexible with regard to time and place since there are few colleagues to take over the work for those who are absent. Also larger companies argue that e-learning is flexible in time and place and that it is efficient regarding travel cost and time. E-learning may be especially interesting for enterprises with individual or small groups of employees scattered over a large geographical area since they may have considerable costs travelling to a training centre.
2. *Cost reduction.* The analysis indicates that e-learning can reach and connect geographically dispersed groups and hence reduce costs related to travel and accommodation that is common in face-to-face training. Furthermore, the flexibility of time makes it possible to reduce costs related to absence from work.
3. *Logistical advantages.* E-learning also has logistical advantages. It is swifter and easier to distribute digital course material than printed material. The Golf case argues that the spread of Golf entrepreneurs throughout the country and the logistical challenges almost self-evidently lead to the use of the Internet.
4. *Reduced time to market.* E-learning may increase the competitive strength because of accelerated time to market. E-learning could be accessed by a large number of employees as soon as it is available online. For example, the Rabobank case study describes how the introduction of a new life insurance policy was accelerated by e-learning.
5. *Increased sales.* York and Interpolis experienced that e-learning content can have great importance in sales negotiations. E-learning could be perceived as a value added service that customers appreciate. Interpolis, for example, regards training as a specific tool to increase the added value of its products.



6. *Improved ties between enterprises.* E-learning may result in improved relations between the enterprises in a value chain. For example, Interpolis developed courses for their intermediaries. At Roche, e-learning has made it possible to confine co-operation between clients and the contractor.
7. *Positive organizational effects.* At York, e-learning has resulted in better internal communication and broader understanding of York offerings. It has also had a positive effect by giving employees a common experience to build on. A better understanding of the organization is also the intention of the three courses developed for Golf: Introduction to working at Golf, Golf Rules and Golf Marketing.

### Success Factors

The project analyses suggest that the following factors are central to successful e-learning in SMEs:

1. *Completion rates.* Completion rates are often mentioned as a success factor, and the NKI case argues that completion rates vary between three different categories of courses. The course *Tutor in distance education* seems to have the highest completion rate since it is a prerequisite to becoming an online tutor at NKI. The courses that the students enrolled in at their own initiative also have a rather high completion rate. The courses initiated by the management seem on the average to have a lower completion rate. Differences in completion rates relate mainly to differences in motivation levels among participants.
2. *Management support.* Support from managers and internal e-learning competency are repeatedly mentioned as success factors. Important indicators of support from managers may include opportunities to study during work hours and clear indications that e-learning courses will result in promotions or better payment.
3. *Motivation.* Motivated employees are crucial for successful e-learning. The employees' motivation increases when courses are relevant to their daily work or personal interests. To be successful, e-learning must be motivating as well as relevant and useful to the daily work and tasks in the company. Motivation may be improved by use of multimedia, occasional face-to-face meetings, certificates and external financing.
4. *Certification.* Certification may be a very useful motivational element, and many SMEs are dependent on some sort of legal competence requirements. Both Interpolis and Rabobank emphasise the importance of obtaining a validation from an external certifying body. Golf maintains that it is an advantage to offer electronically printed certificates via HTML.
5. *Compulsory courses.* Several of the courses in these case studies are to some extent compulsory. The KPMG courses are nearly compulsory since the knowledge of the course content is essential for the employees, and they are required to spend a certain number of hours on training to maintain their licence. Interpolis benefits from the fact that all SMEs must have a protection officer who has completed a course for protection officers. The Roche case also maintains that e-learning must be obligatory to become a success.
6. *Content and course design.* The cases imply that successful e-learning should build on practical, in-depth and up-to-date knowledge of the subject area as well as suitable models and technology. This may include initial training to get familiar with the e-learning platform and the people involved with the course. At York, multimedia content is successful because it efficiently supports a more visual learning style. Roche recommended that the introduction of e-learning should be well-planned.
7. *Blended learning.* About half of the institutions in this article used blended learning. Meeting face-to-face seems to have positive effects, but it reduces flexibility and adds costs. This is illustrated in the A-punkt case that stated: "Sometimes it was not so easy to take part in the in-person venues as the fixed dates were not freely changeable. But nevertheless the face-to-face days were also a motivation to continue the further training". Therefore it could be wise to do as KPMG does, focusing on the necessity to find the right balance between e-learning and other training activities.

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