

## ■ Research Article

# E-Learning: A Service Offering

Anu Moisio\* and Riitta Smeds

*SimLab, Helsinki University of Technology, Helsinki, Finland*

In Finland, both public and private organizations are actively applying information and communication technology (ICT) in adult education. Providing ICT-supported education, e-learning, requires focus on the virtual setting, but also on physical and human factors. Studying the e-learning phenomenon from a service perspective gives new insights into how to provide better learner satisfaction.

The article presents a qualitative two-case study. The cases come from Finnish organizations: one case from a polytechnic and one case from a large company. The choice of cases gives an excellent opportunity to compare practices between public and private sector. The cases have been studied using participative case simulation, an action research method. This method enables gathering of rich data, since all key players from the real-life case gather together to share knowledge on a case that was realized in the near past. The researchers get to know how the case was executed in its reality, and not an ideal version about how it should have been realized.

After analyzing these cases from a service process point of view, a framework of e-learning as service provisioning is presented in this article. This framework emphasizes the fact that e-learning is a mixture of physical and virtual servicing. The most important service element is the interaction between the learner and the tutor. The technology has not removed the importance of the human face; the role of a tutor is reshaping itself. Copyright © 2004 John Wiley & Sons, Ltd.

## INTRODUCTION

During the last few years, e-learning has become an important study mode in Finnish adult education, both in public educational institutions and private companies. Organizations want to be recognized as modern implementers of information and communication technology (ICT).

E-learning is believed to have an important role in empowering learners. The rise of e-learning has had an interesting side effect in some organizations: it has forced the management and teachers to rethink the educational processes. The processes that were not recognized in the past at all have

become more explicit (Moisio, 2002; Moisio *et al.*, 2003).

The objective of this article is to create better understanding of e-learning as a service. In this article, e-learning includes studying and teaching, and the related administration that is supported by ICT-based processes. The cases from a Finnish polytechnic and a large Finnish company show that e-learning extends beyond the virtual setting, and is heavily dependent on physical service elements and human interaction. We pose the following research questions:

- Based on two cases, which factors in the e-learning service offering are critical for learner satisfaction?
- What implications can these cases have on the general theories of service offerings in the e-learning context?

\*Correspondence to: Anu Moisio, SimLab, Helsinki University of Technology, PO Box 9560, 02015 HUT, Finland.  
E-mail: anu.moisio@hut.fi

BACKGROUND THEORY

Learners as customers

The theoretical inspiration for this article is gained mainly from the Nordic school of service management (Grönroos and Gummesson, 1985). For a service provider the focus of all activities is to provide high customer satisfaction. For an educational institution, or a company that provides training, the customer is the learner. The learner is also a member of the organization. Therefore the service delivery process can be regarded as one application of internal marketing (Varey, 1995; Varey and Lewis, 1999). Our research investigates the process from a learner perspective to see how well the organization responds to its implicit value proposition: the organization as an e-learning service provider.

Service offering for the virtual marketplace

When developing a model for service management in the organization, one has to fully understand the overall setting of the service delivery process. The model has to be observed from a customer perspective to focus development activities on the issues that hold the greatest value for the customer (Grönroos, 1990, 2000).

To enhance understanding of the service as a whole, Grönroos (1987) has designed the Augmented Service Offering model. This model was originally created for service offering in the physical marketplace. It contains both the technical and functional dimensions of the service. Later, Grönroos *et al.* (2000) have refined the model into the NetOffer model to meet also the needs of the Internet age and virtual servicing. The NetOffer model (Grönroos *et al.*, 2000) is illustrated in Figure 1. The model has been initially created based on a case of Internet cinema ticketing, which is also used in this article as an example to explain the different elements that constitute the NetOffer model.

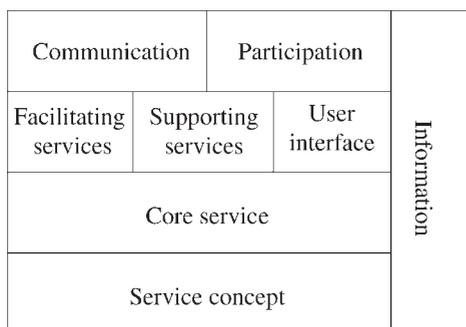


Figure 1 The NetOffer model for the virtual marketplace (adapted from Grönroos *et al.*, 2000)

Starting from the bottom level of the model, the elements have the following characteristics:

- The development of a service starts from defining the *service concept*, to understand the entity that a service organization provides. In the Internet cinema ticketing example it can be formulated as: 'To offer tickets to movies supported by value-adding information related to current and future films easily accessible for a customer any time or place convenient for him or her'.
- The *core service* is the reason for being on the market; in our example: 'An Internet-based way of providing tickets to movies any time'.

The next level, facilitating and supporting service elements, plus the user interface element, represent the dimensions of technical quality in the model; they answer to the basic question: What is being offered to customers?

- *Facilitating service* elements are mandatory for the usability of the core service. In the Internet cinema ticketing example, online payment is one of the facilitating service elements.
- *Supporting service* elements are not mandatory. Their purpose is to differentiate the service from competitor offerings. In our example, movie news by e-mail represents one of the supporting service elements. The borderline between facilitating and supporting services is often unclear.
- In a virtual setting, the importance of a well-functioning and appealing *user interface* is critical. It has to sell the offering itself, since there are no service personnel available. In our ticketing example, the navigation system has a clear logic and it is easy to use, which lowers the threshold for online shopping.

The top elements of the model define the functional or process-oriented quality of the service: how is the service being offered? These are the augmentation elements of the service.

- In Internet services, the absence of direct interaction with service personnel means that the Web site has to be easy to use and technically advanced to take over the work of the service personnel. Accessibility is a common feature of virtual service points; they are open 24 hours a day. Both getting access and interacting with the virtual service are included in the *communication* element. This is different from the original model for the physical marketplace (Grönroos, 1987) where the accessibility and interaction elements were separate entities.
- *Customer participation* is required in all service processes, since service is consumed and

produced simultaneously. Customers often interact also with each other, e.g. in discussion forums on Web sites.

- The last element, *information*, cuts through all levels of the service. This element represents the information supply that has to be provided when offering services on the Internet (Grönroos *et al.*, 2000). The information element was not included in the original model for the physical marketplace (Grönroos, 1987).

In this article, the NetOffer model is used as a starting point to analyse the e-learning service elements from a learner perspective.

## METHODS AND DATA COLLECTION

The two cases studied for this article enable valuable comparison between practices at the public and private sector. The study is based on action research and comparative case study methods. The cases belong to the multidisciplinary Helmi project at SimLab, Helsinki University of Technology. The project's overall objective is to research and develop innovations in processes and business models in Finnish networks of e-learning, both in the private and the public sectors. The study is based on the research tradition of SimLab, which is a visual learning and experimentation environment for groups to enhance innovations and organizational learning in companies and public institutions (Smeds, 1997; Smeds *et al.*, 2003). The participative simulation of a concrete case turns the strategy and practices of e-learning in an organization from tacit knowledge into explicit and enables continuous improvement. The strategy-driven business process development methods are based on organizational learning theories (Nonaka and Takeuchi, 1995; Wenger, 1998; Smeds *et al.*, 2003).

The two organizations have put forward a case project on e-learning that was developed and realized in the near past. The research team at SimLab formed an overall view of the case by interviewing the key persons involved (polytechnic:  $n = 12$ ; company:  $n = 9$ ) in the development and realization of the Web-based course, including management, teachers, IT support personnel and students. In addition to interviews, the researchers have also had access to the company learner feedback that had been collected after the course.

The data from each case was visualized into a process map that describes the activities of the different players and their interrelations in the progress of the project. This map was presented and thoroughly discussed together with the case actors

(polytechnic:  $n = 24$ ; company:  $n = 20$ ) in participative interactive process simulation sessions that lasted one whole day. The simulation was facilitated by the researchers.

Participative case simulation was used as a basis to get a deep common understanding for all the people involved in the case and also for people who wanted to learn about it. In addition to discussion, the participants wrote ideas on paper slips that were collected on notice boards. The two sessions were video-recorded. In addition, the researchers took notes about the discussions. The material gathered in the sessions was grouped and analysed by the team of four researchers for mutual validation.

## THE CASES

### The polytechnic

The case organization is active in applying e-learning as a study method and has invested heavily in e-learning competence development of the staff. The competition for students has become more intense during the last few years, and institutions pay special attention to brand management issues. E-learning is one of the tools to attract students, who ask for flexible ways of studying. For polytechnics e-learning is the first ICT solution to cut through the whole institution, including the learners (Moisio, 2002). Therefore the practices of using ICT in learning are not yet embedded in the organization.

In the polytechnic case the learners were first-year students of social sciences and health care. The study module was a project assignment on regional planning that was designed by a group of teachers from different disciplines who also acted as tutors on the course. The learners were divided into small teams and each team was given a dedicated tutor. In addition, a peer student team was nominated for each team for exchanging comments on the project work. The project assignment was prepared according to the needs of working life organizations (e.g. social work in municipalities). The contact persons from working life also acted as tutors for the project work, since the teams had the possibility to meet them when preparing the assignment.

According to the interviews, the learners had minimal ICT skills when they started studying. The ICT facilities were inadequate, both for learners and tutors. Furthermore, no ICT personnel had been allocated to support the learners.

The phases of the service process are described in Figure 2.

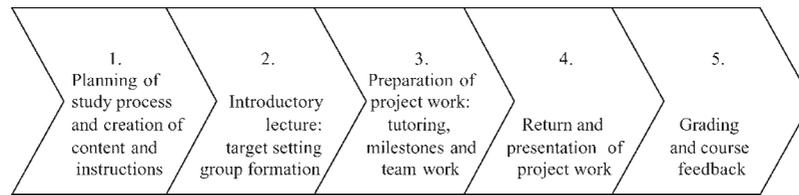


Figure 2 Phases of the polytechnic service process in the provisioning of e-learning

The tutors carried out phase 1 of the e-learning service provisioning process. They worked as a team to prepare a study module on the virtual learning environment (VLE). The content consisted of instructions and links to authentic sources on the Internet. To facilitate the study process, the tutors set up project milestones for teams. There were also team communication tools available on the VLE.

This first phase of the service process was prepared behind the learner visibility line, meaning that the learner did not take part in this phase of the process. The second phase, the introductory lecture, was the first encounter between learners and tutors from the polytechnic. The goal of the introductory lecture was to clarify the targets of this study module, introduce the tutors and set up the learner project teams.

The teams started their work in phase 3. The teams had the possibility to meet face-to face at the polytechnic or have a virtual meeting on the VLE. The peer student teams were asked for comments on the project work plan. If questions were raised, they were able to contact the tutors during on-call hours, either online or face-to-face. There was a possibility to send e-mail to tutors. They also met with the contacts from the working life.

The project work was returned (phase 4) and thereafter presented to peer students in a closing lecture. The study module was finished and the teams were assessed. The teachers requested feedback from the learners to be able to develop the study module further (phase 5).

**The company**

The company case operates in the ICT branch and has a rapidly changing business environment. It

arranged an extensive training programme for its expert-level staff both to raise their understanding of the business and the customer value chains and to facilitate the participants’ personal contact networks. The target of the programme was not to provide clear answers to difficult questions on company business but to give to the learners some new means how to solve these questions themselves. Learning to use the virtual environment as a natural communication channel was also one of the targets of the programme.

The training programme consisted of seminar days, problem-based learning (PBL) assignments and project work. To prepare the assignments and the project work, the learners were divided into teams of five members. There were several people involved in the tutoring: the training programme coordinator, an ICT support person and two seminar facilitators came from outside the company; they were members of an external training service provider. The company Human Resources Development (HRD) manager was also involved in the realization of the training programme and thus visible for learners. In addition, representatives from company business units acted as tutors for teams in the realization of the customer-focused project work.

The learners had used ICT actively as a part of their daily work but had not necessarily studied online before. Each of them had a personal computer and access to the Internet. Professional ICT support was available for them.

The service process of this case is presented in Figure 3.

The case company had outsourced the programme to an external training service provider. However, the high-level coordination of the programme was kept in the company HRD function.

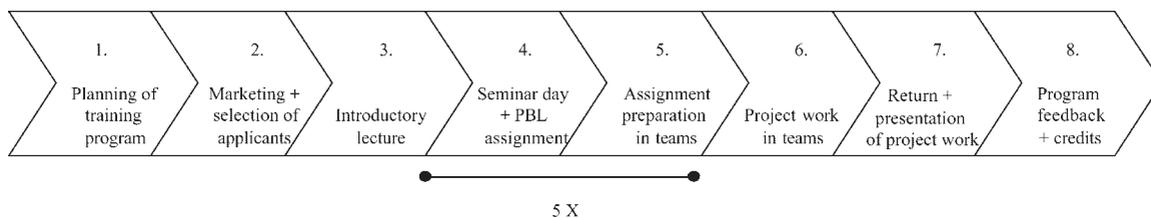


Figure 3 Phases of the company service process in the provisioning of e-learning

Several people, including the top management of the company, took part in the planning of the training programme (phase 1).

The programme was marketed to company expert-level staff, mainly by Intranet. The learners were chosen through an application process (phase 2). The programme started with an introductory day (phase 3), where the learners were given an overall view of the programme. They were also instructed how to use the VLE that was offered as a learning tool.

Phases 4 and 5 formed a module that was carried out five times consecutively during the programme. First there was a one-day seminar with distinguished lecturers. At the end of the day the learner teams were given a PBL assignment. Based on the theme of the day, the teams were requested to define a question that interested them and to prepare a report that answered the question after the seminar day. This report was stored on the VLE. The teams were encouraged to use the VLE also for virtual discussions throughout the programme. There were two facilitators who tutored the seminar days and the PBL assignments.

The role of the PBL assignments was to lead the teams from the themes of the seminar days to the project work. Different topics for project work were presented (phase 6). The teams selected their preferred subject through a voting procedure that was performed on the VLE. The topics were real-life business plans to be carried out in cooperation with key customers. The teams were expected to utilize the knowledge they had gained during the five seminar days and PBL assignments. Selected company business unit representatives were to tutor the teams' project work and arrange the first encounter between the team and the customer. The teams prepared a business plan and published it on the VLE. The training programme coordinator tutored the preparation of the project work.

The finalized project work was presented in a closing seminar where company management and key account managers were present (phase 7). The training providers requested feedback on the VLE (phase 8) to develop the programme further. The learners were given study credits applicable in further studies.

## RESULTS

Next we take a deeper look at the cases, studying them from a theoretical perspective. We shall use the Augmented Service Offering framework to create an understanding of the most critical service elements, both virtual and physical, and identify

which elements need more attention to create higher learner satisfaction.

### Service concept and core service

In the Augmented Service Offering and in the further elaborated NetOffer model, the service concept defines what a service organization provides as a whole. We define the service concept of the polytechnic process as

*Offering the learners a flexible way to realize an e-learning study module that both raises their awareness on the subject matter and on ICT.*

In the company process the service concept of the training programme can be formulated as

*Offering the learners methods to create new expertise in business planning and enhancing the use of Web-based working among the learners.*

In both cases the goal was twofold; in addition to learning the subject matter, the organizations wanted the use of ICT as an everyday communication tool. This was natural because of the youth of Web-based teamwork; although company learners were more familiar with ICT than the polytechnic learners, discussing and sharing information on the Internet was an unfamiliar working method for them as well.

We now define the core service looking at both cases from an e-learning perspective. The core service explains the reason to be on the educational market and, particularly in these cases, why Web-based tools are applied. For both cases the core e-learning service is very similar and can be defined as

*To offer a virtual environment for a team of learners that supports the team communication, assignment preparation and publishing.*

The target in both cases has been not only to disseminate information and publish documentation but also to encourage the learners to communicate on the Web. Next we shall see how well these goals have been met.

### User interface

In the NetOffer model (Grönroos *et al.*, 2000) the user interface is an important element of the service package. Our research supports this fact. In both cases the learners interviewed felt discomfort with the user interface of the VLE and used it mainly to publish the completed assignments. The interaction concerning the preparation work occurred mainly face-to-face or by e-mail. At the polytechnic, the learners found the environment

too complicated and wished a simpler structure. The company learners would have preferred an e-learning solution that is integrated into the company Intranet, an everyday tool for them.

The first encounter between the learner and the interface defines the image of the virtual environment. If the user interface is properly designed, the learner will understand the structure of the VLE and already feel confident at the first time. This calls for simplistic overall design and clear instructions that support the structure of the entire training programme or study module.

**Facilitating and supporting services**

As was stated by Grönroos (1987), the borderline between facilitating and supporting service elements is often fuzzy. It may be hard to define which service elements are mandatory and which only increase the attractiveness of the service. The Table 1 represents our understanding of the categorization in these cases.

While the quality of the facilitating and supporting elements determines the technical quality of the service, the quality of the augmentation elements determines the functional quality of the service.

**Augmentation elements of the service**

According to the NetOffer model the augmentation elements of the service consist of communication and participation. In our research we found that the communication element needs to be divided into accessibility and interaction elements, according to the original model designed for the physical marketplace. The next subsection addresses these elements in more detail.

*Table 1 Facilitating vs. supporting service elements in the two cases*

	Facilitating service elements	Supporting service elements
Polytechnic	Content planning and instructions Seminar days Assignment preparation Return of assignment Grading	Introductory lecture Working life contacts
Company	Content planning and instructions Selection of applicants Seminar days Assignment preparation Return of assignment Credits	Introductory lecture Customer-organization contacts

*Accessibility*

Accessibility to facilities and the Internet, including the VLE, proved to be very significant in the polytechnic case.

The polytechnic learners were dependent on the open hours of the polytechnic. They needed the facilities for face-to-face team meetings and computer usage. Many polytechnic learners did not have a computer at home, so they had to access the Internet at the polytechnic premises. The scarcity of computers at the polytechnic resulted in queues in the computer classes. There were no ICT support personnel at hand, which the learners regarded as a considerable shortage.

Access to facilities and Internet were taken care of in the company case. The learners were able to use the workplace facilities whenever needed. The employer had provided personal computers for all learners. In principle there were no ICT accessibility problems.

*Interaction between the learner and the organization*

Tutoring proved to be the focal interaction element in the polytechnic case. The learners contacted the tutors actively in both minor and major problems, both on the Web and face-to-face. An important quality issue in tutoring was the agreed and communicated service response. The learners knew when one of the tutors was online or on call at the office to give guidance. If they wanted to leave a question by e-mail, they knew how soon it would be answered.

In the company case several people were involved in tutoring: the facilitators took care of the seminar days and the PBL assignments. The programme coordinator supervised the project work. There was a possibility to leave questions on the VLE that were divided between tutors and the ICT support. This feature was barely used. The learners stated in the interviews that they were uncertain who the actual leader of the entire training programme was. There were lots of company development ideas raised in the programme. The facilitators felt that there should have been a specific programme leader inside the company to act as a process owner and an ambassador of the programme towards the company management. This person could also have been actively present on the VLE.

Contacts with outside working life/customer organizations were an additional interaction element, where the outside organizations acted as tutors. In both cases the assignments responded to the needs of an outside organization. According to our findings, the real-life problem setting increased their motivation for the assignment.

*Customer participation*

While consuming the service offered, the customer also takes part in the value production process of the service. In our cases, the learners participated actively in the seminar days as well as completing the written work required. There were differences between cases regarding the learner online participation in team work practices. The learners in the company case worked independent of the tutors, whereas polytechnic learners asked for help when needed. Also virtual discussions between learners occurred mainly in the polytechnic case.

We find two reasons for this difference. First, learners need a tutor with a face, even when working online. The more active the tutor is online, the more likely the learners take part in online activities. This was taken care of in the polytechnic. The company learners found that there were too many persons involved in tutoring and none of them was active online. This resulted in somewhat faceless tutoring interface, and did not encourage the learners is online activities.

The second reason for different learner participation in the service process concerns the different learner profiles in these cases. For company learners the training programme was additional to their daily work. The learners used their normal work time to attend the seminar days, whereas the rest of the work in the training programme was carried out mainly during free time. This resulted in streamlined working processes, completing the work as effectively as possible. The polytechnic learners were full-time students with little experience from working in projects. They needed the support of tutors and peer learners to carry out the study module.

**Information**

In the NetOffer model the information element cuts through all layers of the service. In these cases the information element had a crucial role. Education is a very knowledge-intensive service. Our findings support the fact that the mere information element is not sufficient on its own. The other elements are needed as well. In the next subsection we will define the e-learning service offering based on our cases.

**E-learning service offering**

We now return to the theoretical prerequisites (Grönroos, 1987; Grönroos *et al.*, 2000) that constructed the structure of our analysis. Based on the findings of these two cases we present a framework for e-learning service offering, which is visualized in Figure 4. The model integrates elements of

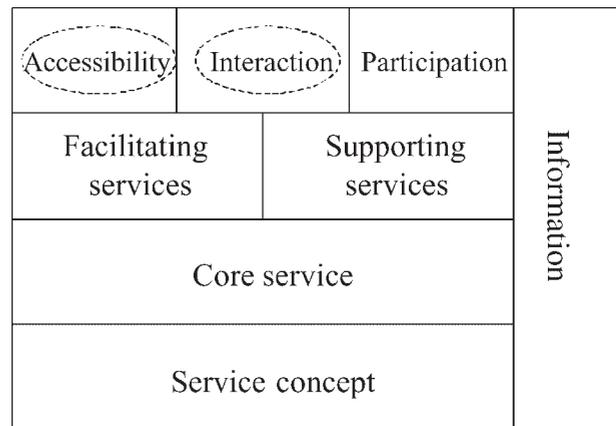


Figure 4 E-learning service offering (differences to NetOffer model encircled)

the models designed for physical and virtual marketplace.

Our model contains two encircled elements, accessibility and interaction, that are not included in the NetOffer model. However, these elements were included in the original Augmented Service Offering designed for the physical marketplace (Grönroos, 1987). The NetOffer had merged these two elements into one: the communication element. Our research cases suggest that ICT accessibility is a prerequisite for a technically and functionally successful e-learning service. Access to the Internet has to be taken care of by the organization providing the education, not by the learner. For learners, a VLE open 24 hours per day is worthless if they do not have a computer to access the VLE. This became evident especially in the polytechnic case.

The cases also proved that interaction between learner and tutor is a crucial element. According to learner interviews, tutoring is expected to be more than communication on subject matters: learners expect the tutor to support the learning process. In the polytechnic case, although learners were unfamiliar with project working methods and ICT tools, active tutoring encouraged them in their teamwork. In the company case, the absence of an active tutor resulted in each team member working alone for the project.

**CONCLUSION**

In the two cases, e-learning as a study method was a novel approach for learners. Starting to apply ICT as an everyday learning tool requires support from the training organization. This support concerns both technological and human factors. The threshold of starting to use ICT in learning ought

to be made as smooth and attractive as possible. The cases proved that, in e-learning service offering, enhancing learner satisfaction involves developing the technical and human interface of the learning service.

A necessary, but not sufficient, condition for e-learning is ICT accessibility. The company management had invested in sufficient number of computers, whereas in the polytechnic the lack of computers was seen as a remarkable bottleneck in the service. However, irrespective of the number of computers, the learners in both cases perceived the user interface to the VLE to be too complicated. This is a clear risk for the learners' satisfaction.

Tutoring seemed to contribute remarkably to the overall satisfaction of the learner. From the management perspective, the polytechnic and company cases are like mirror images. The management of the polytechnic was aware that the learners could find it difficult to study online. This problem was solved by emphasizing the importance of the human interface in e-learning: the tutoring. The company management relied on the learners' capability of self-direction in learning at work. Thus, more attention was paid to ample content than to the pedagogical issues. This was, however, not sufficient; the online human interface is clearly needed also in the case company.

The study revealed a gap between tutor expectations on learner behaviour and the actual learner behaviour. It is hard for tutors to understand the learners' everyday life and plan a course that can be carried out with a reasonable effort. The learner focus on the course should be on subject matters and not on technological problems. To reduce the gap it is highly recommended that the case organizations involve the learners in the planning of their learning paths, the processes needed, from both human and technological perspective.

## DISCUSSION

E-learning has been barely studied from a service perspective. Looking at learners as customers gives new insights for training organizations. If an organization providing e-learning has succeeded in its work, the information that has been transferred during the service process has become active knowledge for learners. It should, however, be stated that learners have the final responsibility for learning. Even the best e-learning service cannot guarantee final learner satisfaction.

The background theory (Grönroos, 1987; Grönroos *et al.*, 2000) used in this article provided a well-applicable framework for our research.

E-learning is often regarded as one of the many e-services. There are similarities: learners or learner teams are expected to service themselves to some extent. Optimally, learners can choose the most feasible time and place for studying. Automated services are intended to lighten routine work. But there are differences compared to other e-services as well. Because of the youth of e-learning, it takes time and effort for learners to get accustomed to online studying practices. Training organizations, educational institutions as well as industrial companies, have ambitious goals for e-learning. However, like the company case well illustrated, they often fail to understand that learners have difficulties in applying different modes of studying at the same time. Self-servicing ought to feel rewarding, and not cause additional stress. To avoid the excess burden in handling e-learning routines, the learners need both self-service and personal service, and both service processes need to support one another.

New learner generations who have used ICT since their childhood are likely to set increased demands for e-learning service organizations. They switch easily from face-to-face contacts to online discussions. They are used to servicing themselves using e-services in their everyday life. Studying is a complex process and the challenge, also for the future, is to find a suitable mix of both face-to-face and online activities.

This article has focused on identifying the elements needed to provide a coherent e-learning service. To fully understand the complex service offering, the next step is to evaluate the e-learning service from a process perspective. Tutors provide a service, and learners take part in the consumption of the service. Therefore, hearing the voice of the learner already in the planning of this collaborative learning process is of focal importance in learning service development.

## ACKNOWLEDGEMENTS

The research reported in this article was part of the Helmi project (Holistic Development of e-Learning and Business Models) at SimLab, Helsinki University of Technology (<http://www.simlab.hut.fi>). The present authors are grateful for the joint research effort of the whole project team, which has made this article possible.

The financial support from the National Technology Agency of Finland Tekes, the Academy of Finland, the City of Espoo, Laurea Polytechnic, Radiolinja, WSOY and Helsinki University of Technology is gratefully acknowledged.

## REFERENCES

- Grönroos C. 1987. Developing the service offering: a source of competitive advantage. In *Add Value to Your Service*, Surprenant C (ed.). American Marketing Association: Chicago; 81–85.
- Grönroos C. 1990. *Service Management and Marketing: Managing the Moments of Truth in Service Competition*; Lexington Books: Lexington, KY.
- Grönroos C. 2000. *Service Management and Marketing: A Customer Relationship Management Approach*. Wiley: New York.
- Grönroos C, Gummesson E. (eds). 1985. *Service Marketing: Nordic School Perspectives*. Research report R 1985:2, University of Stockholm.
- Grönroos C, Heinonen F, Isoniemi K, Lindholm M. 2000. The NetOffer model: a case example from the virtual market space. *Management Decision* 38(4): 243–252.
- Moisio A. 2002. Customership in e-learning service provisioning: a case study from public educational institutions. In *Fourth CINet 2002 Conference 'Continuous Innovations in Business Processes and Networks'*, Espoo, 15–18 September 2002; 483–493.
- Moisio A, Markkula M-L, Smeds R. 2003. E-learning lessons learnt from a student perspective: a cross-case comparison between public and private organizations. In *Seventh International Workshop of the IFIP WG 5.7 Special Interest Group on Experimental Interactive Learning in Industrial Management*, Aalborg, Denmark, 22–24 May 2003; 129–139.
- Nonaka I, Takeuchi H. 1995. *The Knowledge-creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press: Oxford.
- Smeds R. 1997. Organizational learning and innovation through tailored simulation games: two process re-engineering case studies. *Knowledge and Process Management* 4(1): 22–33.
- Smeds R, Haho P, Alvesalo J. 2003. Evolutionary change management in NPD processes. *International Journal of Technology Management* 26(8): 887–902.
- Varey RJ. 1995. Internal marketing: a review and some interdisciplinary research challenges. *International Journal of Service Industry Management* 6(1): 40–63.
- Varey RJ, Lewis BR. 1999. A broadened conception of internal marketing. *European Journal of Marketing* 33(9/10): 926–944.
- Wenger E. 1998. *Communities of Practice: Learning, Meaning and Identity*. Cambridge University Press: New York.