

## CHAPTER 13 IMPLEMENTING INTEGRATED E-LEARNING: LESSONS LEARNED FROM THE OUNL-CASE

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### INTRODUCTION

The problem of technology is not technology, but rather its implementation. From the 1970's, a world-wide technology euphoria proclaimed the indisputable benefits of computer automation: computers were the magic spell to improve economic productivity and production efficiency, promising a radical change of society and, ultimately, a radical change of life itself. But even though all this seems to have become true to a certain extent, establishing automation projects in the 1970's and 1980's appeared highly problematic (Tapscott and Caston, 1993; Forester, 1989). When, occasionally, such projects were concluded successfully and the systems and software were working all right technically, users often turned out to be unable or unwilling to handle these in an appropriate way. Inadequate business process analyses, technocratic problem solving, cryptic human-computer interaction and grossly lacking involvement of user groups, be it system administrators, office staff or consumers, caused a pile of insurmountable problems right after the systems' installation.

As yet, the processes associated with the implementation of new technologies are complex and highly unpredictable. A number of theoretical frameworks have been developed to describe the processes by which technologies are adopted and deployed: the theory of reasoned action, the theory of planned behaviour or the classical diffusion and innovation theory (Fichman, 2000; Pantano and Cardew-Hall, 2002; Rogers, 1995). All of these frameworks start from the premise that the adoption of innovations is determined by individual beliefs and perceptions. Also, it is assumed that the adoption decision is taken by the individual, which is unfortunately rarely the case when implementing e-learning. Various authors therefore question the validity of these frameworks (Pantano and Cardew-Hall, 2002; Gallivan, 2000). Theoretical frameworks for organisational change like Total Quality Management, Business Process Redesign, Process Change Management, Kaizen certainly may give hold, but seem to have only poor predictive value: successes and failures are known for each (Grotevant, 1998; Utterbeck, 1994).

This chapter will take a pragmatic perspective. We will highlight and discuss some relevant implementation issues while using the Open University of the Netherlands (OUNL) as an illustrative case. To deal with the complexity and multidimensionality of the implementation process we will consider it from different angles in order to identify and assess relevant difficulties, decisions and critical factors for success or failure. In close connection with the OUNL-case, we will focus on three relevant questions for technology-based innovations and try to express for each question our lessons learned.

- Vision on innovation: How is integrated e-learning substantiated from the institute's mission and strategic goals?
- Organisational change strategy: What strategy should be used to assimilate integrated e-learning?
- People: How to treat the human factor, which has to accept and carry the innovation?

It is claimed that each implementation should explicitly think through these issues; disregarding one of these may cause serious problems (Silius and Pohjolainen, 2002; Bates, 1997). Before we will elaborate these issues we will briefly describe the OUNL-context.

## THE OUNL CASE

The context of distance education sets high demands to an educational system. At the OUNL, each course rests on an explicit instructional design and is being delivered in a balanced mix of different media. Indeed, the OUNL's pedagogical model is strongly based on mediated instruction. Its learning materials are designed for (guided) self-instruction. From its start, the OUNL built up quite some expertise to develop self-contained virtual practicals for the training of skills and competencies. In addition to print, these practicals use audio, courseware and linear as well as interactive video and often focus on offering complex, authentic training tasks. The pedagogy of (guided) self-instruction ("independent learning") seems to fit the population of adult students, for the greater part having a job, studying at their homes at times they choose. It should be admitted that the OUNL's choice for an "independent learning" pedagogy has more or less been a compulsory one, dictated by the restrictions of distance education. When in the 1990's the world-wide-Web and its TCP/IP-protocol seemed to become a world standard for communication, the OUNL realised that these Internet-technologies might be the vehicle for a revolutionary re-assessment of distance education (Itzkan, 1994). The Internet might overcome the drawbacks of common distance education while enabling computer-supported communication between teachers and students, instant access to learning resources, file exchange and collaborative learning (Westera and Sloep, 2001). Indeed, since 1997 the Web-based virtual campus of the OUNL ("Studienet") has been used to facilitate the mutual communication between students and between students and teachers. It is the OUNL's first step towards integrated e-learning.

Notwithstanding the fact the OUNL had implemented many new methods, tools and technologies to enhance the quality and efficiency of learning since its start at 1984, the introduction of Studienet was different both in size and impact. It not only demanded the involvement all departments, but it also affected the institution's primary processes in a fundamental way. The OUNL's management, being well aware of the risks of such radical technology-based innovation, set up this project in a meticulous and professional way, while generously covering many relevant issues (resources, communication, project management, involvement of users, testing, professionalisation, support, etcetera). But even when in the end the implementation of Studienet may be considered quite a success, many difficulties were encountered that threatened the project's prosperity. In the rest of this chapter, we will use the OUNL as an informative case to illustrate the introduction of new technologies in (distance) education. We don't profess to be exhaustive, but will pick out some relevant occurrences to illustrate and review the implementation issues, mentioned before.

## VISION ON INNOVATION

Before starting any e-learning activities or projects one should compose a clear vision on education and innovation. Obviously, it is not sufficient to substantiate a simple e-learning pilot by saying "it is important to gain e-learning experiences and know-how". Such ad hoc approach runs the risk to be outstripped by another ad hoc idea some weeks later. An adequate vision should cover the "what and why" of innovation and go into envisioned processes, structures and staff roles (chapter 12 of this book). It should preferably start from pedagogy: indeed, any educational provider should provide a pedagogical means rather a technological one. Obviously, the vision should be made explicit and laid down in a wide-

spread document. Also, it should be discussed, known, carried and adopted at all levels in the organisation, that is, not only by the management, but also by shop-floor workers. A vision document should make the innovation objectives concrete by explicitly describing what innovative education should look like. For the OUNL, the anticipated role of e-learning is characterised by the integral incorporation of information and communication technologies (i.e. integrated e-learning) in order to reassess the meaning of “distance”, “contact” and “educational services”. It addresses vast digitised reusable content which atoms can be managed electronically in order to compose tailor-made individualised training programmes. Such programmes would take into account the individual’s prior knowledge, personal goals and capabilities. The envisioned educational system presumes a severe redesign of the OUNL’s business processes and seems to require an infrastructural (top-down) approach rather than a bottom-up approach. It requires a change of focus from mere instructional design of learning materials towards educational design at the organisational level. Over the years, this view on the importance of integrated e-learning for the OUNL has appeared to be an adequate one.

### Sharing the vision

The thoroughness of this view doesn’t necessarily make it a shared view. Despite a series of plenary discussions with the staff, the internalisation of the innovation view turned out to be a toilsome and time-consuming process. The OUNL-management board as well as the communication department well underestimated the efforts that are necessary to achieve sufficient acceptance and support (see chapter 12 of this book for additional suggestions). To this end, plenary sessions are extremely important. At certain stages, however, the management should clearly express its position and demarcate between the issues that are open to discuss and the issues completed. This requires a subtle balance between directive and non-directive modes of leadership, which reflects the alternation between authoritarian and democratic management styles, ready and patient ears, consistent reasoning, adequate timing and persuasiveness. In this respect, the OUNL-management could have done better, especially by pointing at the impact of this view on the organisation, its processes and existing roles. Still, full acceptance of the innovation view has not been established. Many discussion issues keep slumbering while no explicit finalisation has occurred. This is even amplified by the culture of debate as connected with the academic context of the OUNL. Special attention should be paid to premises and starting points: a tendency of technology-push (indeed: introducing an overall and dominant e-learning system) may give rise to long-lasting disputes that can never be resolved. A final weakness in the OUNL’s innovation view – and perhaps in any futuristic view – is that no one really could foresee and take into account the radical consequences for the organisation, the arrangement of working processes and the people’s job descriptions. As was the case at the OUNL, such uncertainty should also be shared. By stressing the pioneering role for all involved in innovation, unforeseen problems and questions should be received as collective challenges rather than unwanted setbacks. Indeed, innovation can be exciting as such.

### Lessons learned

With respect to developing a vision we identify the following lessons learned:

- Develop a vision based on educational motives rather than technological, advertising or other motives.
- Make the vision explicit and accessible by releasing a vision document.
- Make the vision a shared vision: arrange discussions about key issues, especially about starting points.
- Combine directive and non-directive modes of leadership.

- Make explicit decisions to finalise discussion topics step by step.
- Create a collective sense of pioneering by pointing at the uncertain and challenging route to innovation.

## ORGANISATIONAL CHANGE STRATEGY

A clear vision on innovation doesn't automatically guarantee a successful innovation. The vision should be interpreted and translated into a strategy for organisational change. For the effectuation of such strategy, projects have to be defined to redesign, test and introduce new organisational structures, new business processes and new role descriptions (see chapter 10 of this book).

According to its view on innovative distance education it followed that the OUNL had to incorporate e-learning technologies in its educational services. In 1995 the challenging question was: would the OUNL be able to launch a web-based virtual campus, accessible from all over the world to staff and registered students? It is important to notice that at the time the Internet was still immature, turn-key solutions were not available, not to speak about Web-based learning platforms. All Web-facilities for the OUNL had to be designed, developed and implemented by internal experts. In fact, the OUNL set itself the task to develop a Web-based learning platform before the term even existed. To realise this idea, large efforts were made to create favourable conditions. Sufficient budgets and people were reserved and allocated to develop the Studienet. Various projects were defined which progress was guarded and controlled by a company-wide steering committee. These projects were well separated from running business. The projects' focus was essentially at both the technological development of a Web-based environment and the organisational structure that is necessary to run and maintain it. Today, technical system's development is less critical, as many off-the-shelf solutions for e-learning are commercially available. Within the scope of this chapter we will only slightly touch upon the technical part and focus at the implications at the organisational level.

### The preparation

Altogether, the preparation of Studienet turned out to become a major operation that took away substantial budget and human resources from the primary processes for a period of one and a half year. After this period of intense effort the technical part, viz. the Web-based learning environment, was delivered all right. This was one of the first operational Web-based learning environments in the world: it was innovative, impressive and trendsetting, especially for other educational providers. Also the organisational support structure had been prepared in great detail. To warrant the adequate creation, use and management of hundreds and hundreds of course sites in Studienet existing structures had to be redesigned, taking into account new tasks, new responsibilities, operational procedures and proper management. Because of its company-wide impact a functional unit was set up that transected all existing departments. Such approach signifies a collective responsibility and promotes company-wide support and acceptance. In the OUNL, the Studienet Board of Management, composed of representatives of all OUNL-departments, is responsible for the quality, reliability and accessibility of all Internet services. It allocates webmasters for each course and issues editorial directions with respect to topicality, style of writing, correctness, integrity and representativeness of the information. Also, the Studienet Board of Management also guards against malpractice and against breaking the law; in particular, it watches infringements of copyrights, criminal laws, privacy regulations and laws on computer crimes. To stress the site-ownership of webmasters, each page in Studienet displays the author's name and an email link to promote approachability. Several procedures and protocols have been introduced to allow swift

processing of standard transactions, i.e. the allocation of discussion groups, the declaration of new webs, authorisation requests, password problems, reporting and fixing of bugs etc.

### The launch

To introduce all this, the OUNL-management chose a reserved strategy that relied on generating a small number of successes by early adopters. It was hesitant to change common processes abruptly and, for the time being, persisted to consider Studienet an additional facility for devotees. A coherent implementation plan for integrated e-learning was not available (chapter 12 of this book). The management supposed that a gradual growth of the use of Studienet by both faculty and students would occur more or less autonomously, besides modest incentives. To this end, all editorial staff has been trained extensively to get acquainted with the basic ideas of Studienet, its structure, its procedures and its data-entry tools. Additional support is rendered through an extended instructional site, which acts as an online manual and which presents answers to FAQ's. In case of emergency, a helpdesk is available.

### Effects

Even though the OUNL management was prepared that the wide-spread use of Studienet by both educational staff and students would take quite some time, reality still fell short: despite splendid facilities, extensive information and proper training and support, for a long time the Studienet was populated by limited number of early adopters only. The majority of staff showed reserve and reluctance. The OUNL-management highly relied on organic and autonomous change. Although such strategy might work at the beginning because it attracts an enthusiastic and motivated group of early adopters, it gradually will fail because, unintentionally, exactly these early adopters will restrain other staff to join in and thus will serve as an alibi for the majority of staff to remain uncommitted. In 2001, 4 years after the launch, an internal survey showed that Studienet had become an important means of information for both staff and students. So far, the Studienet was quite successful. Yet, as a means to deliver education things were different. It appeared that only 10 % of the 400 OUNL-courses in Studienet actually offered (some) online content and associated computer-mediated communication. One may sense some reserve of the staff, here. And this is quite understandable. Despite all organisational, precautionary measures, we should realise that the introduction of a web-based infrastructure at the OUNL meant breaking the old habit of bottom-up innovation. It implied a top-down strategy, highly pushed by technology. Such innovation strategies can be observed anywhere, often causing implementation problems (Bates, 1997). From one day to the next, new facilities were made available, which forced the staff into new patterns and the use of new tools, while existing innovation patterns remained worth while as such. This full launch stressed the technical dimensions and overwhelming nature of Studienet and created anxiety rather than enthusiasm. Staff remained highly noncommittal, while re-establishing existing patterns. As a consequence, only little e-learning content was developed or delivered during the first years and students not always could establish any surplus value when visiting Studienet. Also, the sudden availability of Studienet greatly interfered with running business, which further restricted the possibilities of instant adoption and habituation. A gradual introduction via confined pilots might have worked better, here. It would have supported a smooth transition to new business processes and probably it would have generated easier commitment and acceptance by the staff. To stimulate the use of such system, the management should define explicit targets that includes clear incentives and rewarding mechanisms (Bates, 1995). Perhaps, the failure of the organic approach to organisational change could have been anticipated: if the management fails to specify explicit goals, targets, migration schedules, incentives, a sense of urgency and criteria

to assess the implementation, staff is likely to remain passive and uncommitted. To achieve successful organisational change the management should explicitly facilitate the necessary redistribution of roles and responsibilities.

Yet, as the years went by, Studienet experienced a substantial growth. More and more, faculty and students seem to have become acquainted with the Web-environment and, interestingly, seem to have swapped positions with the management. Some five years after the launch of Studienet, staff and students urge the management loud and clear to extend the e-learning facilities. Eventually, one might even conclude that the prudish change strategy has worked in the end: everything comes to him who waits.

### Lessons learned

With respect to organisational change we identify the following lessons learned:

- Develop and communicate a change strategy.
- Don't underplay the organisational impact.
- Clarify the redistribution of roles and responsibilities.
- Take enough time for staff to get acquainted.
- Develop a coherent implementation plan to cover all relevant issues
- Set explicit targets with respect to actual use and available content.
- Set up an operational support unit that transects all existing departments
- Arrange adequate support facilities: training, manuals, helpdesk.
- Apply incentives and rewarding mechanisms to promote growth.
- Reposition the status of common business with respect to innovation.
- Involve students and other users.
- Arrange significant pilots.
- Generate, communicate and extend early successes
- Arrange evaluations (see chapter 15) and be receptive to user requests.
- Take into account maintenance and upgrading.

### PEOPLE

Any organisational change to pursue innovation has to be carried by people. Tension may easily arise between organisational demands and individual beliefs, perceptions, needs, visions and attitudes, especially in a knowledge-intensive context with highly educated and professional staff. We will pick out and elaborate two issues: training and empowerment of staff.

#### Staff training

As indicated above, training is necessary to provide sufficient knowledge and skills amongst users. When regarding training it is important to carefully discriminate between different types of users. With respect to Studienet, tutors, course designers, authors, content editors, graphic designers, PR officers, IT-engineers, maintenance staff and – last but not least – students will all have their particular views, tasks and interests. To prepare the OUNL-staff for working with Studienet a variety of training was set up, which could roughly be divided into functional training and technical training. Functional training focuses on the role of Studienet as a channel for educational delivery by emphasising its conceptual and pedagogical possibilities, while technical training concerns general IT-skills and the practical operation of software applications. A frequent pitfall is to focus on technical training only. Basis IT-training is also offered to OUNL-students (“Studying by mouse”). It is important to notice that all this training has been offered without obligations. Although new roles and tasks were defined with respect to course development in Studienet, course teams and individuals could decide for themselves whether a training would be appropriate or not: required competence

levels for the various tasks have not been formalised and established in human resources management. Yet, obliging the training might have adverse effects, because this neglects the possible complaints, beliefs, attitudes and fears that make people stay aloof. Training on the job may be a better alternative.

### Empowerment

Empowerment as low as possible in the organisational hierarchy is assumed a critical condition for successful implementation, especially in a community of academics. Empowerment concerns the right to decide on one's own training, the choice of tools for Web-based content or even the right to develop private layouts that deviate in style and approach from institutional formats. Such decentralised empowerment may well conflict with the idea that the introduction of a web-based infrastructure by definition represents a top-down approach. Indeed, the fixed format of the database-published websites, the associated style-sheets and the prescribed software for communication aroused many objections. In fact, content development at the OUNL is greatly decentralised and many a content developer claims that the freedom of movement and independence – not to say anarchy – are prerequisites for creativity, innovation and quality. Restrictive facilities like Studienet and its strict prescriptions and regulations are easily perceived as a threat to quality and flexibility. To accommodate these objections the OUNL went pretty far by lifting the rule to use OUNL style-sheets for content webs and allowed faculty to design their own websites or to install and host different server software at will. Obviously, there is a discrepancy between the need for cost-efficient management and the desire for unlimited exploration. The need for cost-efficiency represents the long-term goal of innovation, viz. the creation of new products and services or a new approach to the design, production or marketing of goods against acceptable cost. The desire for unlimited exploration represents exactly the means to arrive at this goal, by promoting creativity and reflectivity. Originally, Studienet was supposed to be the only Web-based learning facility, now some ten different web-based delivery platforms are operational. By now, the OUNL is slightly reversing its liberal policy. To anyone it is clear that cost-effectiveness of such policy is poor. Recently, the ideals of harmonisation and uniformity, both in pedagogy and in look and feel, have gained popularity. One might conclude that the OUNL has successfully finished the phase of initial exploration and acceptance and is ready to enter the phase of wide diffusion of a uniform approach to the creation and delivery of web-based content. Clearly, this initial phase took many years.

### Lessons learned

With respect to the human factor we identify the following lessons learned:

- Emphasise functional training rather than technical training (see chapter 13).
- Customise training for different target groups, including students.
- Press for sufficient skills: interrelate training and human resource management (see chapter 12).
- Preferably oblige training, but respect training escapism by offering training on the job.
- Empower staff as low as possible in the organisational hierarchy.
- Allow (some) deviations from institutional formats and tooling, especially during the start-up phase of e-learning.
- Beware of the call for unrestrained creativity; consider cost versus envisioned gains.
- Offer outstanding author environments.

### IN CONCLUSION

As has been explained in this chapter the company-wide introduction of a web-based learning environment is a complex operation. From the start, the implementation of Studienet

has been taken very seriously by the OUNL, being only too aware of the flaws of introducing new technologies. A Board of Management, a help desk, editorial directions, procedures for operation and maintenance, extensive staff training, all of this has been arranged quite neatly. Yet, we cannot but conclude that the implementation of Studienet has been a laborious and lengthy process, which still has not been completed, in full width. This chapter reviewed a number of relevant topics and expressed a number of lessons learned. To a certain extent, these lessons learned may look self-evident. But for a full understanding of their significance it is necessary to meticulously think through the underlying patterns and pitfalls as described above. At various points, our lessons learned indicate how we could have done better. Yet, it would be a mistake to think that these lessons learned would secure us against problems. So, the ultimate lesson learned is a challenging one: whatever problems are anticipated, be prepared that the implementation will fall short.

## REFERENCES

Bates, A., *Technology, Open Learning and Distance Education*. Routledge, London/New York, 1995.

Bates, A.W., *Restructuring the University for Technological Change*. Paper presented to the Carnegie Foundation for the Advancement of Teaching, June 18-20, London, 1997. Available at: <http://bates.cstudies.ubc.ca/>

Fichman, R.G., *The Diffusion and Assimilation of Information Technology Innovations*, in: *Framing the Domains of IT Management: Projecting the Future Through the Past*. Ed: Zmud, R.W., Pinnaflex Educational Resources, Cincinnati, 2000, 105-127.

Forester, T., *Computers in the Human Context; Information Technology, Productivity and People*. Basil Blackwell, Oxford, 1989, 9-11.

Gallivan, M.J., *Organisational Adoption and Assimilation of Complex Technological Innovations: Development and Application of a New Framework*. *Database for Advances in Information Systems*, 2000, 32 (3), 57-85.

Grotevant, S.M., *Business Engineering and Process Redesign in Higher Education: Art or Science?* Presented at CAUSE 98 Seattle, Washington, 1998. Online version: <http://www.educause.edu/ir/library/html/cnc9857/cnc9857.html>

Itzkan, S. J., *Assessing the Future of Tele-Computing Environments: Implications for Instruction and Administration*. *The computing Teacher*, 1994, 22(4), 60-64.

Pantano, V., Cardew-Hall, M.J., *Technology Diffusion and Organisational Culture: Preliminary Findings from the Implementation of a Knowledge Management System*. Proceedings of the IEEE International Engineering Management Conference 2002, Centre for Technology Management, Cambridge UK, 1-6.

Silius, K., Pohjolainen, S., *Strategic planning for Web-based Learning and Teaching at Tampere University of Technology*. Proceedings of European Conference on The New Benefits of ICT in Higher Education, 2002, Erasmus-Plus, Rotterdam, pp/ 182-189.

*Integrated E-learning; Towards more powerful Learning Environments* (2004), Chapter 13, pp. 176-186

Tapscott, D. and Caston, A., *Paradigm shift; The new Promise of Information Technology*. McGraw-Hill, Inc., New York, 1993, 36-38.

Utterbeck, J.M. *Mastering the Dynamics of Innovation*. Harvard Business School Press, Boston, 1994.

Westera, W. and Sloep, P. B., *Into the Future of Networked Education*. In: *Cybereducation, the Future of Long Distance learning*. L. R. Vandervert, L. V. Shavinina, R. A. Cornell (eds.), Mary Ann Liebert, Inc. Publishers, New York, 2001, (115-136).