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E-learning in a competitive firm setting

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This paper explores the use of e-learning technologies for organisational learning within a commercial environment. A model has been developed to represent those factors that determine organisational learning. This model has been embedded within a case study based on the use of an e-learning program that was developed in order to enhance employees' knowledge and endorse corporate values within a Norwegian company. The results of the study reflect the high performance of the e-learning program. They also highlight critical issues concerning the successful implementation of e-learning technologies to achieve the knowledge sharing that is required for organisational learning.

Introduction

The phrase 'new economy' is often used to describe contemporary economies (Lundvall & Johnson, 1994; OECD Science, Technology and Industry Scoreboard, 1999), where the importance of knowledge and learning is highly appreciated. This is because improved capability, either at the individual or organisational level, leads to increased organisational performance and employee satisfaction, which in turn contribute to the welfare of individuals and society as a whole.

Economists have long neglected the concept of organisational learning by focusing mainly on the standardisation of labour and work-practices and explicit parts of knowledge. However, tacit elements of knowledge are crucial for the competencies of individuals and the competitive advantage of firms (Prahalad & Hamel, 1990; Hall, 1994).

Classroom teaching, distance learning through the reading of books and other written material, and apprenticeship relations where apprentice follows master in action are traditional modes of education and training. With the recent advances in information and communication technologies (ICT), an alternative mode, e-learning, has come on to the scene. *E-learning* is technology-based learning such as computer-based learning, web-based learning, virtual classroom and digital collaboration. It is widely believed that e-learning technologies are going to change and revitalise education and training (*SRI Consulting*, 2000; Cone & Robinson, 2001) thereby bringing new benefits to society.

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This paper describes the application of e-learning for organisational use in a competitive firm context. This has enabled us to identify the critical issues in the implementation of successful e-learning in order to achieve organisational learning. The remainder of this paper identifies and discusses: our model for organisational learning, the case study, the findings and the conclusions.

Organisational learning

> An organisation learns when it acquires new knowledge or skills of any kind and by whatever means. To be organisational, the outcome of learning must be embedded in the images of the organisation held by its members' mind and/or in the epistemological artefacts embedded in the organisational environment. (Agrygis & Schön, 1996)

Organisational learning starts with individuals acquiring knowledge and skills. Conceptual learning refers to the ability to articulate a conceptual understanding of experience, i.e. know-why. Operational learning refers to the acquisition of skills, i.e. know-how (Kim, 1993). In order to study organisational learning, it is necessary to consider *individual factors* of the learners, the characteristics of the *learning tool*, i.e. the knowledge carrier, and the *organisational context* in which learning occurs (Ancori *et al.*, 2000, p. 281).

Several characteristics of learners and teachers affect the success of learning. From the perspective of adult learners, prior knowledge (adult learners are experienced), learning history, affective aspects, volition (adult learners are self-directed and autonomous) and social aspects (e.g. social environment) are all part of the tacit or subsidiary elements of the learning situation. In the design of learning teachers need to consider whether the learning content is in the *zone of proximal development* of the learners, as well as whether the form in which the content is presented is attractive to the emotional, cognitive, volitional and social side of learners. We use Vygotsky's (1978) notion of zone of proximal development as an analogy for adult learning reflecting the potential for learning, not the difference between what they can do alone and with help from others. In addition, the likelihood of successful learning increases when learners experience the learning environment as safe, positive, similar and relevant to practice (Merriam & Caffarella, 1991; Martinez, 2001).

The same goes for artefacts designed to enable learning. Learning tools (including the embedded pedagogical considerations) enable learners to internalise the content of the learning tools by interacting with them.

For learning to be organisational, the content of the learning tool must be diffused throughout the organisation, becoming a *theory of action* for the organisation. The organisation of learning *per se* affects the outcome. Presentation, security, incentives, the availability of assistance for the individual learners and access all influence the performance of learning (Agrygis & Schön, 1996; Bolk *et al.*, 1997). Figure 1 summarises the key factors in our organisational learning model.

The maturation of e-learning technologies will increase the interest in understanding why e-learning works, what effect it has and how to conduct successful e-learning. There is a lack of studies in the literature about implementation problems (Beller & Or, 1998). However, we believe that our organisational learning model might be helpful when implementing e-learning within a company context. The relevance and significance of the model that we produced was tested using the empirical case study as described in the following section.

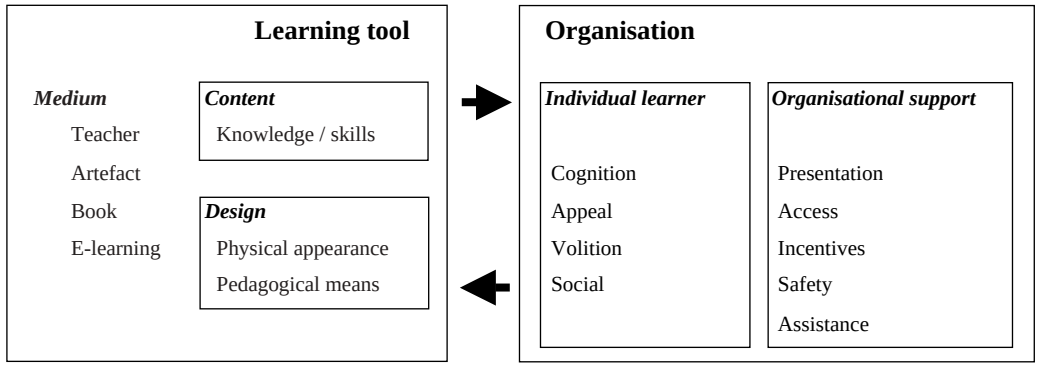

Figure 1. Organisational learning model—variables influencing learning outcome

E-learning in practice

Introduction

We attempt to answer the question 'What are the critical factors for successful e-learning implementation in a firm?' by observing and evaluating the implementation of an e-learning program used by Expert Norway AS (henceforth EN) to increase front-line employees' knowledge about the firm's values. The company values were: customer orientation, credibility, salesmanship, simplicity, efficiency and team spirit. The employees' endorsement of the values in their choices of action was expected to affect the sales performance which, in turn, would result in increased market shares.

The firm under investigation purchased a customised e-learning program called '*Expert in a Day*' from Involve AS (henceforth INV). The program consisted of two parts: selected chapters of the operations handbook used in EN and an interactive program to help employees become familiar with the content and use of the handbook. In other words, the program was developed to enhance employees' knowledge and understanding of the values connected to the brand '*Expert*'.

The program was asynchronous, web-based, located on the server at the company's headquarters and accessible through the company intranet. It was written in Flash code, except for some parts like the logon sequence, which was written in Hypertext Mark-up Language (HTML). Flash was used to make navigation functions, animations, introductions and web sites rich with illustrations. HTML was used for defining the content and layout of web pages. The actions of learners in the e-learning program were logged in a database and were accessed using Structured Query Language (SQL)—a database programming language used for manipulating data in a database.

Methodology

Our study was an *instrumental case* study, which ran during the period from March to October 2002 (Stake, 1994). We gathered the empirical data through observations of the e-learning program and semi-structured interviews with the project managers in EN and the project manager and a senior advisor in INV. In addition, we participated in company meetings.

We interviewed seven employees/learners and five managers of *Expert* shops located in the eastern part of Norway. In order to secure fair representation, we selected the shops according to type (*Expert* or *Expert Bonus*), location (rural or urban) and ownership (owned by EN or a local owner).

The interview questions were based on the organisational learning model. Our assumption was that the factors mentioned in the model would affect the outcome of the learning. In this study, e-learning outcome refers to:

(a) the learners' appraisals of their *e-learning experience*;
(b) the *learning effect*, based on the their appraisals and the outcome of value exercises embedded in the e-learning program; and
(c) their perception of 'belonging', in other words the feeling of being part of EN.

Results (1): outcomes of the e-learning process

Throughout this section, a number in brackets—for example (2)—refers to the number of learners replying with the same or similar responses.

E-learning experiences. The learners mentioned several pros and cons of e-learning as compared to traditional learning. Starting with the pros of e-learning, the time aspect was important. E-learning is more efficient (2) and flexible (2) in terms of time. Learners can decide when to take it (1) and continue when they want to if they are disrupted (1). E-learning is also more flexible when it comes to place (2). E-learning is a good (2) and efficient way of learning (2). It is fun (2), easy (1) and demands few resources.

The social aspect of e-learning was the most commonly mentioned disadvantage of e-learning in the literature but our study showed that courses are more social (4) and it was valuable to exchange experiences with learners from other shops.

While the majority of learners (5) claimed that e-learning was more efficient, others claimed that traditional courses are more efficient (2). Some learners preferred to listen to others talking (1) or appreciated the opportunity to get away from the workplace (1).

The shop managers mentioned similar pros and cons but they put more emphasis on the economic aspects. On the negative side they mentioned the social aspects (3), with particular reference to learners not having the opportunity to meet and discuss their different experiences with others. When it comes to the experiences with lecturers, the results are divergent. One manager emphasised that it could be beneficial to get stimulus from other sources whereas others (2) were critical with regard to bringing in lecturers, as it was never seen to be successful in the shops. Some (2) mentioned that a combination of e-learning and traditional learning might be preferable.

Learning effects. Learners were positive in their assessment of the learning effects. All but one reported that they learned some skills through using the program. Only one learner responded that no learning had occurred and said that everything was repetition.

In general, learners found the content useful and relevant to their work. When asked if they thought it would affect their work practice, they replied that it confirmed what they already did (3) and it might change their practice to a certain degree (4).

We asked the shop managers about the effects of the program. All stated that they thought it would lead to changes although some mentioned that there were certain necessary conditions for this. Time and availability is important and training must be continuous to deal with all the change occurring.

The e-learning program included two identical exercises in order to measure the performance of learners in recognising and identifying the company's values. The learners completed the exercise at the beginning of the program and repeated it at the end of the program. Even though 490 people used the program, not all of them completed both tests. The maximum score for the value exercises was six. The score on the first value exercise was relatively high (mean = 4.90, SD = 1.54, number of learners = 490), indicating a high degree of knowledge of the company's values among learners. Nevertheless, the average on the second exercise was higher (mean = 5.44, SD = 1.14, number of learners = 451), indicating a positive learning effect. The learning effect was significant ($t(390) = 6.36$, $p < .001$).

Effects on learners' feelings about the company. We asked learners if the program affected their feelings with regard to being a part of EN, since this is an important factor affecting individual performance and thereby organisational performance (Meyer *et al.*, 2002). Some (4) already felt part of EN and they thought the program could strengthen their feelings further, whereas others (3) did not think the program would have any influence.

The project managers in EN reported that the e-learning program reached employees who normally received little information about what was going on in the company. Normally, a limited number of employees went to exhibitions, meetings and seminars, but the majority of employees depend on receiving information from the ones attending. The project managers believed that by increasing the coverage of employees the program affected the employees' feeling of being part of EN.

Results (2): determinants of organisational learning

This section presents the results of our study of the factors in our organisational learning model that influence corporate learning: *content and design of learning tool*, *individual learner* (i.e. employees) and *organisational support*.

Content and design of learning tool. The content of the e-learning program consisted of selected chapters from the operations handbook and an interactive part including information about corporate values and simulations of situations that exemplify company values. The program was intended to be a tool for all employees to familiarise themselves with the use of the operation handbook and to have a common understanding of EN's values, including how to act accordingly.

The program included explicit elements, such as corporate values and contextual and tacit elements such as pictures taken from the company. One example is the digital operations handbook, which learners access by clicking on a picture of the physical operations handbook. Learners go through the program individually whenever they want and at the pace they want. It is up to learners as to what extent they want to consult and read the operations handbook throughout the use of the program.

The program called for *learner activity* by exercises. The attitude exercises were intended to make learners reflect upon their values and explore how the values affect their behaviour in specific sale situations. Furthermore, the program asked learners if they could recognise the values of *Expert* from a list of values. Finally, the program asked learners to recognise the content of each value.

The program included *simulations* of real-life situations in the shop by using pictures and sounds. Then the program asked learners to choose an action coinciding with the values of *Expert*. At the end of the program, learners have to go through a *certification test*. Before they do so, they could read the operations handbook in preparation. After passing the certification test, learners have the opportunity to win products from *Expert* shops in a lottery.

Individual learner factors. *Cognition* concerns learners' prior knowledge and skills. Overall, the results of our study include cognitive issues concerning (a) the level of the content, (b) the difficulty of the program, and (c) the role of learning history such as experience with computers and work experience.

Concerning the *level of the content*, learners replied that there were some new aspects (4) but the majority of content was repetition (5) and it was neither too hard nor easy (4). The shop managers generally replied that they found the content relevant and useful.

Regarding *the difficulty of the program*, the majority of learners (5) agreed that they 'totally agree' that it was easy or okay to accomplish the exercises in the program.

The majority (6) of learners claimed that they had enough *prior knowledge* of computers and computer programs to navigate the e-learning program. All learners found that they had sufficient knowledge to complete the program successfully.

Appeal concerns the emotional aspects of learning. Bearing in mind that experiences that evoke feelings are more easily remembered, all learners reported that the program was fun to use (3) or otherwise spoke about it in a positive manner (4). When asked more specifically what feelings the program evoked in learners, the most common reply was that it did not evoke negative feelings (3), only positive feelings (3). The shop managers described mostly positive reactions from learners on the program.

In the interviews with the e-learning firm, the affective and volitional components were mentioned as key issues when it comes to designing a successful e-learning program.

Volition concerns the will and motivation for accomplishing learning. All respondents were motivated to use the program. The most negative comment was that it was okay (1). When it comes to how the program itself affected motivation, learners found the program okay (2), engaging (1) and not boring (2).

Social concerns the social and communicational aspects of learning and the learning setting. The evaluation of the social aspects of the e-learning experience was interesting. Almost all of the interviewed learners found it lonely (5), but still thought it was okay (7). We were also interested to see if learners discussed the program with their colleagues. Unexpectedly, few (2) had discussed it. One reason for this is that they had completed the program at the time of the interviews and they had not had time to discuss the program (4).

Organisational support factors. *Presentation* concerns how the learning is presented to the learners, the information and priority given. The managers of the shops introduced the e-learning

project in the shops (4). However, they varied in their conduct because of different knowledge about the program.

The learners' evaluations concur with those of the managers of the shops. About half of them described the introduction to the e-learning program as satisfying (4) whereas the other half knew little about it before they went through the program (3).

An e-learning program must be organised, managed and supported by the organisation implementing it. INV particularly emphasised the role of *leadership* and *time* as critical issues in the implementation. It is a challenge to reach all learners in the target group. Executives play a central role in reaching this objective.

The presentation of the e-learning program reflects the executives' attitudes and signals to employees the importance of e-learning. The e-learning project at EN was supported by the company's top executives through their commitment, but not to the same extent among the executives in the shops. It is our belief that this influenced the outcome of the e-learning. To reach all participants with the correct *information* is a challenge and a possible success criterion.

We focused on two types of *access*: *time* and *technological access*. All shops had access to computers and extranet connections. The interviewees confirmed easy access to a computer. Only one learner reported the problem of being disconnected several times from the extranet connection. When the shop managers were asked whether they had any problems with the technology, they responded that they upgraded their browser before starting to use the program.

The interviews confirm that the shop owners provided the time needed for learners to successfully complete the program. One learner reported that he spent less time than was ideal as he completed the program during opening hours.

Three shop managers reported problems for learners in participating in the program during opening hours, since customers or fellow workers interrupted them. When interrupted, learners had to start the program all over again as the program did not record the answers. One shop manager solved this problem by organising the learning to take place outside opening hours.

For e-learning to have the desired effect, learners must be given time to complete the program. This again is related to the attitudes of the executives. If they give e-learning high priority, they will make sure the employees can complete it. Our case confirmed this. The shop managers claimed that it was a challenge to find time for the e-learning project, both for themselves to attend meetings and for learners to go through the program without disruption.

Incentives concern the internal or external motivation of learners. EN included the possibility for learners to take part in a lottery after completing the e-learning program. In addition, some shops put up their own incentives for completing the program. All these are incentives directing the learners' external motivation. These probably played a certain role, but according to learners and the shop managers, the internal motivation was more important. Several learners pointed out that it was interesting in itself and stimulating to use the program (4).

Security concerns the learners' trust and feelings of safety, e.g. that the results will not be traceable to their boss. However, this was not an issue. The security was not an issue. Learners responded either that it did not matter or that they were indifferent to the issue.

Assistance concerns the availability of help and assistance when needed. The need for assistance did not appear to be an important issue for either the managers of the shops or for learners. Except for one learner who received help, it seems assistance was not a critical issue.

Discussion of findings

In general, learners had positive experiences with the e-learning program. All interviewees agreed that they would like to use similar programs again. They confirm that e-learning is flexible in time and place, while traditional learning is flexible in content. The e-learning program is also cheaper for the shops compared to traditional learning tools since the shops are then able to avoid the costs of sending employees to a course.

The results indicate that e-learning can be a means for conceptual and operational learning, leading to new knowledge and skills and may be a vehicle for changing firms' *theories of action*. Most learners reported that the program provided them with new knowledge or confirmed what they already knew. The program had an effect on the skills of using the digital operations handbook as well as the learners' knowledge of both the values of EN and the content in the operations handbook.

In addition, the results of our study indicated that the e-learning program influenced learners' feeling of being part of EN. As the EN case study shows a positive impact of e-learning, we can now turn to our findings regarding the factors influencing the implementation of e-learning. Table 1 sums up the findings of our case study.

With respect to individual learner factors, we see that cognition, appeal and volition influence the implementation of e-learning. The results indicate that the social aspect of learning is an issue to consider. Some prefer to be alone whilst others prefer to learn in a classroom situation.

In terms of the organisational support factors, security and assistance were not critical in the implementation phase of the e-learning program. The *security* aspect was absent from the learners' responses in the interviews. Many learners did not even know if somebody else could see their results and responses. The experience of the e-learning provider indicated that assistance

Table 1. Evaluation of the organisational learning model according to the case study results

Variable	Support of variable[a]
Learning tool	
Content and design	+
Individual learner factor	
Cognition	+
Appeal	+
Volition	+
Social	0
Organisational support factor	
Presentation	+
Access	+
Incentives	+
Security	–
Assistance	–

[a]+, support of variable as a critical issue; 0, relevance of the variable cannot be decided; –, variable is not a critical issue.

was a success criterion, but the interviews with the learners did not confirm this. Our model included presentation as a critical issue and interviews strongly confirmed the role of *leadership* in the presentation stage. *Access* in terms of both time and technology appeared as a critical issue. Similarly, *incentives* directed towards inner motivation are crucial.

One key feature of e-learning seems to be the high degree of *learner activity* and *interactivity*. In our case, the e-learning program included many exercises concerning the firm's values (i.e. knowledge) and how to act according to these (i.e. skills). The program seeks to be close to reality by *simulating* real-life situations with which learners are familiar. The program simulates situations in the shop as well as the relationship between teacher and learner. The feedback the learners received on the exercises reflects the latter. One can say that the e-learning program reconstructs contexts and tacit elements as well as explicit elements like information on the firm's values. A common assertion in the literature is that tacit elements of knowledge are harder to transfer than explicit elements. The e-learning program uses relatively simple means such as graphics, pictures and short stories to simulate tacit and contextual elements. The means are simple in the sense that they do not put excessive demand on hardware, software or bandwidth capacity. *Simplifications* are necessary for pedagogical and technological reasons. First, it removes non-significant decisions emphasising the decisions that enhance understanding. In that sense, efficient e-learning simplifies not imitates reality and is a result of a selection process, emphasising the most relevant information. In addition, simplification is necessary due to technological considerations.

Concluding remarks

We explored the use of e-learning technologies for organisational learning in a competitive firm context and were particularly interested in identifying the critical factors for the successful implementation of e-learning. Our organisational learning model includes features of the learning tool as well as characteristics of the organisation implementing the learning tool. The learning tool in the study was an e-learning program developed and customised to enhance knowledge of the firm's values and the sales skills of frontline employees throughout a chain of shops in Norway selling consumer electronics.

Our results confirm that e-learning might be a feasible tool for organisational learning in the context of a firm, i.e. for sharing tacit and explicit elements, leading to new knowledge and skills through conceptual learning and operational learning. The e-learning program included pictures, logos, audio and short storylines, simulating and re-creating the firm context as well as situations that frontline employees encounter in their everyday work. The e-learning program resulted in learning, affected the feeling of being a part of *Expert* and was expected to influence work practice. For completing the learning, learners must internalise the knowledge and skills through work practice. E-learning can be a means to change and influence the firms' theories of actions.

Several critical values for implementing successful e-learning emerged in the study. E-learning is about doing and experiencing rather than receiving. This is consistent with the notion of andragogy (Merriam & Caffarella, 1991; Jarvis *et al.*, 1998; Atherton, 2003). The potential for recreating context and simulating situations is one of the strengths of e-learning. Efficient e-learning programs include these aspects and simplify content by removing non-relevant

choices and aspects. Successful e-learning programs motivate, activate and engage learners emotionally as well as intellectually. They fit the needs of adult learners and their organisations by including relevant information that simulates relevant real-life situations as well as the relationship between teachers and adult learners.

An organisation giving high priority to e-learning should provide its employees/learners with enough information about the application, give them access in terms of time and technology, and supply incentives primarily appealing to their internal motivation. A precondition before any implementation is the commitment of company executives at early stages of the implementation. It is hard to change an organisational culture if executives are ignorant or even hostile to changes. As with all new technology, it takes time and effort to maximise the effects and benefits of technology. In our case, the e-learning project was a 'first-time' experience for most learners and the organisation. The challenge is to find the best way of transferring the content according to the needs of the organisation and using a good mix of learning methods. A continuous and holistic approach to learning and training, combining and utilising the strengths of traditional and e-learning methods, will probably increase individual and organisational learning.

Except for social aspects, safety issues and assistance, the factors indicated in our organisational learning model were relevant. But more studies need to be conducted to provide further confirmation and adjustment of the model. In this way we can negate the present weaknesses due to the study being based on one firm and a limited number of interviews.

Notes on contributors

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