
E-learning in enterprises: identifying and realising benefits and improved business processes

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This paper describes some preliminary results from an ongoing research project involving three different types of partners: several quite large companies which are users of e-learning, e-learning sellers as well as several research institutions. The research focus is on identifying critical success factors for more efficient and qualitatively improved learning transfer processes in the companies, supported by ICT-aided learning. Both quantitative and qualitative methods were applied in the research and evaluation design. The research carried out in this project departs from and aims to cover all four levels of Kirkpatrick's model for the evaluation of learning, but an important research goal is to address the organizational level in particular, since most e-learning evaluations address effects that are limited to the subjective and individual level. An important finding is that in order to reap the potential benefits of e-learning, companies must adopt approaches and methods to ensure that e-learning becomes an integrated part of the companies' organization and their learning transfer processes.

Keywords e-learning; evaluation; transfer, business benefits

1. Introduction

The paper addresses an important and crucial issue for all enterprises that invest in e-learning: how to identify, measure and realise the potential of e-learning as a means for improving competitiveness and business practice in general? The paper results from a comprehensive research project involving Norwegian partners of three types: several quite large companies which are users of e-learning, e-learning sellers and several research institutions. The research focus is on identifying critical success factors for more efficient and improved learning transfer processes in the companies, supported by e-learning. Both quantitative and qualitative methods were applied in the research and evaluation design.

Training of employees is an important issue in modern enterprises. Employees need to be kept up-to-date concerning innovations and new ways of working, and to be capable of addressing a fast moving and competitive market. Newcomers need to be brought up to speed as soon as possible. In other words, employees need to be trained in order to perform their job in the best possible way. Training in enterprises may also serve a variety of other objectives, such as incentives for employees, enhancing their employability, fulfilling legal obligations or agreements with labour unions. The many different goals make it difficult to determine what training is most suited and whether training has been successful or not.

Even with a variety of goals, the main reason for enterprises to invest in training is to improve the competitive advantage of the business. This may mean different things to different organizations: improvement of quality, efficiency, productivity or turn-over. In all cases the effects of training should be visible in the work itself. This effect is called transfer of training. It is not sufficient to have good results at the end of training, in the form of tests or exams passed with a good mark, as in national education. Benefits for the work process are required. Transfer of training may be defined as the extent to which trainees are able to use effectively in their work situations the knowledge, skills and attitudes acquired during training (e.g. Baldwin & Ford, 1988; Gielen, 1995, Barnard et al, 2001).

When transfer of training takes place, employees are better equipped for their jobs, and this should be visible in the business processes. To measure the transfer from the training course to improved business processes it is necessary to formulate business objectives that are closely related to the content of the training course. For example a course teaching selling techniques should lead to increased sales. There may also be secondary effects. Employees may have become more motivated or may have gained confidence and this may improve their task performance on other issues than those learned in the course.

In this paper we will first discuss the way in which e-learning may improve business processes, and the way in which this can be evaluated. Next we will describe the implementation of e-learning courses in several Norwegian companies and the measures taken to improve transfer. Evaluation methods used to measure the effects are presented as well as the results. We conclude the paper with a discussion of success factors and of further studies planned.

2. Success factors of e-learning

To determine whether a training course has been successful, we first have to define what we mean by success. The four level model of evaluation of Kirkpatrick (1994) distinguishes different categories of success. The first is the reaction level: the reaction of the trainees to the training program. The second is the learning level: the trainees should have improved their knowledge, skills and/or attitudes as a result of the training course. If there is no success on these two levels, i.e. if the trainees are not happy with the program and have not learnt much, evidence of transfer is not be expected. The third level, the behaviour level, explicitly deals with the issue of transfer. Here success is related to the application on the job of what the trainees have learnt during the course. The fourth level, results, addresses the organizational benefits, and relates to such factors as sales, productivity, profit, costs, employee turnover, and product/service quality. Philips (1996) added another level: return on investment, the cost-benefit ratio of training.

If we want a successful training course, three phases should be addressed: input, throughput, and output. In improving transfer, measures may be called for in all three phases. Three elements are of importance: the trainees themselves, the content and implementation of the training course, and the organizational environment.

The input of the training course consists of the characteristics of the work environment and the trainees. Examples of factors of the work environment are the involvement of management, the facilities for the trainees, and the attitudes of the trainee's direct chief and colleagues. Trainee characteristics are: learning capabilities, motivation, prior knowledge and experience, etc.

Throughput concerns the training itself: its content, the learning materials and the trainer. The quality of the training will influence the outcome in terms of transfer. If the course explicitly addresses how to use on the job what was learnt in training, and if the content is strongly related to work issues, the chances of satisfactory transfer of training are enhanced. It is also of great importance that trainees be given sufficient time, facilities and encouragement by their management.

The output concerns the effects of the training, and the measures taken on the workflow in order to improve the effects of the training course. This may be done by giving trainees time and opportunity to apply what they have learnt, it may imply feedback from colleagues and management, the opportunity to refresh what was learnt, and new training.

Evaluation of transfer of training is always a difficult issue. Transfer of training is usually not very high, figures mentioned in the literature are often not more than 10-20% (e.g. Baldwin & Ford, 1988; Broad & Newstrom, 1992). To prove and measure such small phenomena is no easy matter. Task performances in job-settings are influenced by many factors, not only by a training course the employee has followed. Furthermore, it is not easy to find practical methods and criteria for evaluating transfer of training in a business setting, where experiments are not possible. Therefore Reeves and Hedberg (2003) propose to perform evaluation as an iterative and continuous process, using integrated models that combine both formative and summative approaches.

The model of Kirkpatrick was construed to identify different evaluation methods. For the reaction level, trainee questionnaires asking about trainee satisfaction may be used. For the learning level, exams

and tests may be used. Managers may be interviewed on the behaviour of the employees trained in order to evaluate the behaviour level. Sales figures may be studied to evaluate the results level. Kirkpatrick also mentions more complicated evaluation methods, such as using control groups. However, in the daily practice of enterprises this will hardly be feasible. The four (or even five) levels differ in the difficulty of measuring success. Especially obtaining proof on the third (behaviour) level is seen as very difficult. Measuring business goals, the fourth level, is not so difficult, normally processes are in place in enterprises to measure results. However, it will not be so easy to relate these to better-trained personnel.

Although it may be complicated, our project aims at getting results especially on this fourth level. Our ambition was not only to show improved business results, but also to develop an evaluation methodology for gathering evidence of a positive link with e-learning programs. The study involved four companies, that implemented e-learning as part of their training strategies. It was set up to obtain a broad insight into factors for success of e-learning, and many different aspects were investigated within the practical settings. In this paper we will focus on three main questions:

1. How can e-learning improve directly the work behaviour of trainees?
2. How can the organization support the transfer of training?
3. How can the results of e-learning be measured in terms of business processes?

3. Study on the benefits of e-learning

3.1 Companies and e-learning programs

Four companies are involved in the study. Here is a short description of the companies and their use of e-learning.

Company A: *Notar*. A Norway-based real estate agency with offices in 11 countries. E-learning is used extensively, especially as a tool in the company's trainee programme.

Company B: *Innovation Norway* promotes nationwide industrial development. Innovation Norway has offices in all the Norwegian counties and in more than 30 countries world wide. E-learning is used in "soft skill" training related to organizational and work-related change and development.

Company C: *Norgros Bygghandelen*. Norway's largest retail company for construction materials, with 3000 employees and 130 stores all over Norway. E-learning is systematically applied in the training of sales persons and others.

Company D: *Gresvig ASA*. The Gresvig ASA group embraces business areas for sports and fashion. With the G-Sport, Intersport and Super G chains, the sports division ranks as the leader in the Norwegian market for sports and leisure equipment with more than 3000 employees. E-learning is applied extensively in the training of employees in the retail stores.

Although the companies differ considerably with regard to the content and pedagogical approach of their e-learning programs, they all used the same underlying learning management system and authoring system.

3.2 Evaluation methods

As not all factors can be controlled in real-life business processes, we followed the recommendation from Reeves & Hedberg (2003) who strongly advocate triangulation of methods, collecting data from multiple sources and using multiple methods. Some of the evaluation instruments were used for measurements at several levels. Especially the trainee questionnaire was used not only to measure trainees' subjective impressions of the course, but also to ask their opinion about their work behaviour and about organizational aspects. Having four different companies has the advantage that differences in outcomes may shed light on the factors contributing to failure or success. However, for practical reasons not all the instruments were exactly the same for all the companies, and not all instruments were used in all the

companies. The number of respondents differed between the companies as the number of respondents reflected the number of e-learning course participants in the different companies.

In table 1 an overview is given of the different methods used in the study.

Table 1 Evaluation methods and levels.

Evaluation level	Issues/themes	Indicators/Metrics	Methods used
Reaction	Trainees satisfaction	Subjective experience	Questionnaire for trainees
Learning	What was learnt?	Subject matter specific metrics	Tests in e-learning programs, exams, pre- & post-tests
Behaviour	Applied at work/task performance	Work specific metrics	Questionnaire for trainees, Focus groups, Work place ethnography, interviews with employees and managers
Results	Organizational/business	Business specific metrics	Business output: such as sales, sales of additional products, client satisfaction, control companies

Questionnaire for trainees

The four companies used somewhat different questionnaires, however, most of the topics were the same. The questions addressed accommodation at the workplace, usability, goals, benefits, blended learning, re-use of the course content, and support from management. Usually a five-point scale was used and participants could add free comments. As questionnaires were taken after the employees had returned to work, they also addressed explicitly the issue of transfer of training.

Test and exams

The e-learning programs contained tests to measure the learning outcomes. In company A, where the employees trained followed a complete training program, exams were taken at the end of their training period.

Interviews and discussions

The project was conducted in close collaboration with managers from the four companies. They provided detailed insight into how the training was conducted and what they saw as outcomes of the project. Additional interviews were held with both managers and trainees, and focus group discussions were organised, including discussions between managers from different companies.

Business results

The business results following the training period were studied on three issues:

1. Differences in total sales figures between a period before and after the training.
2. Differences in sales per client between a period before and after the training. In company C and D, the training was focussed on sales techniques. An important part of these techniques is the skill in selling additional products. For example when a client buys a bicycle, the sales-person will try to sell some additional attributes, such as gloves or a helmet. This means that the value of the "shopping basket" of clients should increase.
3. Differences in client satisfaction figures between a period before and after the training.

In addition, sales figures were compared with parts of the company located in other cities, where the training had not taken place.

4. Results of e-learning

In this section we address the three questions asked before. The research is still ongoing, and the results presented are preliminary. In order to attribute business success (partly) to training, preliminary conditions as to the reaction and the learning levels should have been satisfied. This was measured with the questionnaires and the tests. The employees, in general, were very positive about their learning and about

the ease of use of the learning system. More than 85% of the respondents gave a 4 or 5 on a 5-point scale on the question: How easy was e-learning? Usually, but not all, course participants had to pass the tests before they were finished with the e-learning program.

4.1 Does e-learning directly improve the work behaviour of trainees?

In the questionnaires, trainees were asked explicitly about the features of the training that are known to improve work behaviour:

- Clearly defined goals of the e-learning.
- Providing training content that is closely related to the job of the trainees and of practical benefit. Questions and assignments should be adequate and relevant.
- Re-using training materials at the work place

Trainees were also asked whether the e-learning had practical benefits.

In general, the trainees had positive opinions about these aspects. However, there were differences between companies. Company B has the most abstract training program, which has as a goal the change of the corporate culture. This goal is less specific than enhancing sales techniques, which was the main goal of the other courses. Most trainees were of the opinion that their course had practical benefits. Again this was relatively less so in company B. This is, of course, a self-assessment. As in companies C and D no individual assessments are made on sales figures, we can only use data from the fourth level to verify the opinions. An indication for changed behaviour is also that trainees from company A did better on their exams than trainees without e-learning.

4.2 Does the organization support the transfer of training?

In the questionnaires, the participants were asked explicitly about the organizational features of the e-learning. A supporting organization is known to be a key factor in transfer of training.

- Is flexibility (learning where and when you want) an advantage?
- Is the workplace well-suited for e-learning during work hours?
- Does management provide support after the course?

The answers to these questions can be related to the features of the workplace, the observations made and the information provided by management.

In general, trainees saw the flexibility of e-learning as a great advantage. However, it was not always possible to make good use of this flexibility because of problems in the work environment. For company B the environment for e-learning was most suited. Employees have access to computers all-day and as well as the possibility of free time for e-learning. Although the employees of company A also have computers available, they are often away with clients, and their work pressure is such that they cannot easily free themselves for a considerable amount of time to do e-learning. For the other companies (the stores) employees do not work near a computer, so they have to either work at home or go to a special place in the store to get access, meaning they have to go away from their work, which might not always be appreciated by their colleagues and direct managers.

4.3 Benefits of e-learning in terms of business processes

Measuring the benefits of e-learning in terms of business benefits is an ambitious aim. Business success does not only depend on employees who are better trained. There are a large number of other contributing factors. However, we were able to find evidence on the fourth level of Kirkpatrick.

In company A trainees with the highest score on the course tests also performed best in terms of sales as real estate agents when the employee is supposed to apply what he has learnt in actual work settings with customers. This may indicate that the courses had a positive impact on selling behaviour.

In company B, change in culture was the goal. This is very hard to measure. However, one of the ways of realising this goal is the organization of workshops. The people who followed the e-learning came better prepared to these workshops and thus were in a better position to profit from them. This was measured with a questionnaire before and after the workshop, compared to people who had not followed

the e-learning course. Although there was insignificant difference in these groups as to how they evaluated the workshop, those who had followed the e-learning course found that this had contributed to making the workshop more valuable.

Company C reported better sales in stores with a strong focus on e-learning, in terms of total sales as well as additional sales. By applying the “shopping basket” as a measure, we find that the average value of this was more than 25% higher in the “e-learning” store compared to company average. Currently, the research team is looking into the mechanisms behind these significant differences.

In interviews with management, all reported positive benefits from e-learning. It may be considered a promising result that all four companies are continuing with the e-learning courses, improving and extending them, and are thinking about improving organizational features. This result may be placed on the fifth level, the cost-benefit ratio. Companies A, C and D operate in a highly competitive market and are in no position to throw away money for unsuccessful courses. The fact that their management is prepared to continue to invest in e-learning is a strong indication that they see it as profitable.

5. Conclusions

In this paper the success factors and benefits from e-learning supported transfer were identified for several levels and phases. Although the evaluation measurement of these complex aspects faces a number of methodological challenges, it seems that the application of these evaluation strategies has been successful. The approach has made it possible to show that e-learning has positive effects not only on the individual level of users' satisfaction with this mode of learning, but also on the higher levels in Kirkpatrick's “hierarchy”: on behaviour and the organizational level. E-learning seems to have a positive effect on the “learning” outcome, measured by final tests and exams after course completion. Looking more closely at differences between retail stores that use e-learning and those that do not, there is a positive significant correlation between e-learning and sales. The same result appears on the individual level in the real estate agency studied here.

An important finding on a general level is that in order to reap the potential benefits of e-learning, the companies must adopt approaches and methods to ensure that e-learning becomes an integrated part of the companies and their learning transfer processes. Separate, isolated and “one time stunts” with e-learning are not recommended, such half-hearted attempts may sometimes even be counterproductive.

References

- Baldwin, T.T., & Ford, J.K. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology*, 41, 63-105.
- Barnard, Y.F., Veldhuis, G.J., & Rooij, J.C.G.M van (2001). Evaluation in practice: identifying factors for improving transfer of training in technical domains. *Studies in Educational Evaluation*, 27 (3), 269-290.
- Broad, M.L., & Newstrom, J.W. (1992). *Transfer of training: Action-packed strategies to ensure high payoff from training investments*. Reading, MA: Addison-Wesley.
- Gielen, E.W.M. (1995). *Transfer of training in a corporate setting*. Unpublished thesis, University of Twente, Enschede, The Netherlands.
- Kirkpatrick, D.L. (1994). *Evaluating Training Programs: The Four Levels*. San Francisco, CA: Berrett-Koehler.
- Phillips, J.J. (1996). How much is the training worth? *Training & Development*, 50, 20-24.
- Reeves, T.C., & Hedberg, J.G. (2003). *Interactive learning systems evaluation*. Englewood Cliffs, NJ: Educational Technology Publications.