Evaluating the Effectiveness of e-Learning Projects in Croatian Companies

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Abstract. *This paper aims to discuss the level of awareness and use of methods and techniques for evaluation of e-learning projects. Furthermore, it explores obstacles to wider use and attitudes of employees who are involved in the process of strategic decision-making related to e-learning in business settings. Preliminary analysis was conducted with employees that have particular interests and focus in e-learning. Based on the assessment, it is evident that companies in Croatia are still not sufficiently familiar with the techniques for evaluating the effectiveness of their e-learning efforts. Consequently, use of proper evaluation techniques is modest in terms of scope and variety. Relevant international research results emphasise the need to carry out multi-level evaluation and subsequent use of the evaluation results in (re-)forming e-learning strategies. Respecting the multi-level evaluation framework applicable to business settings, a question is raised: do the same methods and techniques fit to academic settings? In that line, mapping of five-level evaluation model to e-learning in academia is presented as a starting point for future research.*

Keywords. evaluation, e-learning, companies, Croatia.

1 Introduction

In line with the increase in ICT investments over the past decades, more and more organizations opt for e-learning as a concept and a tool for training their employees. That, of course, implies the necessity of evaluating that sort of investment.

In addition to cost savings achieved in comparison to traditional training methods (e.g. reducing travel costs, training fee costs and other material costs) (Marengo & Marengo, 2005), other benefits for companies may be achieved: flexible access to the content of e-learning allows employees to follow their own learning pace, to access the courses they want/need, repeat them as many times as they need and at a time that suits them best, thus affecting employees' motivation, i.e. realising social benefit of e-learning (Oye et al., 2012). Another important benefit is that supervision of training becomes easier; i.e. by integrating assessment in learning activities, managers can make sure that employees have completed a training program and that they have the skills they need (Gawliu, 2015). The possibility of self-assessment allows employees an instant feedback, visible only to them, which in turn contributes to relaxed atmosphere, while the possibility of repeating the test provides an opportunity for employees to learn from their mistakes (Deepika, 2014).

Generally speaking, benefits of using e-learning aligned to organizational strategic objectives, can be divided into three levels (Epic Performance Improvement, 2011): (i) general benefits such as cost reduction, followed by (ii) performance improvement and (iii) transformation of organization. While on the one hand, first-level benefits have an operational character and can be easily quantified, the real value and strategic importance arises from the extended benefits, i.e. from second and third level.

Scope and the amount of resources allocated for the development of business e-learning initiatives has greatly increased in the recent years, therefore, increased interest of managers for those initiatives is not a surprise.

It is necessary to measure the results of all the organization's activities in order to be able to manage them, improve them and make them successful (Bersin, 2004). E-learning programs are relatively new programs within companies, therefore, it is natural that they are facing scepticism, extreme caution and often even hostile and distrustful attitude of managers and employees. Therefore, evaluation that demonstrates the effectiveness and value of a program here can be used as a toll for the elimination of such concerns and fears (Petersen, 2010).

Importance of evaluation arises from the fact that it provides answers to the following questions (ibid):

- How well the training program meets the needs and goals of employees?
- What knowledge and skills the training program transfers to employees?
- Is desired change achieved in the performances of employees?
- What organizational benefits are realized?

The lack of pro-active monitoring of training programs (including e-learning programs) can lead to undesirable consequences, such as (Zaineb, 2011): (i) lack of acquiring and using required skills by the employees; (ii) inability to measure ROI and (iii) inability to identify issues and improve future training programs. Hence, the evaluation is a vital part of any e-learning course, just as it is a vital part of any program which aims at continuous improvement. Evaluation measures, among other things, effectiveness of training programs in achieving a certain goal of a company (Kambam, 2014). To ensure the effectiveness of e-learning course (representing evaluation on micro-level), evaluation should be carried out (Sony, 2015):

- during the development phase, to improve the content and courses in general (formative evaluation);
- during or immediately after the implementation phase, to measure the effectiveness of education, training and learning (summative evaluation);
- after the course was implemented, to obtain a clear message on whether the course is still valid or it is necessary to update and change it (affirmative evaluation).

Tanquist (2000) points out number of reasons for conducting evaluation of e-learning one of which is providing useful feedback to the experts, designers, and to all those involved in the development process. Feedback is key to improving the quality and effectiveness of future initiatives. What is even more important, it helps in formulating strategies and decision-making process (both on macro- and micro-level in a company) and provides arguments that management uses to justify the investment. After investing valuable resources in the e-learning program, it is conceivable that company expects that employees are learning what they have to learn and that they will do their job with improved performances, as a result.

Evaluation of e-learning in companies (representing evaluation on macro-level) should give answers to following (Attwell, 2006):

- Is e-learning effective?
- In what context is the e-learning effective?
- For which group of employees is e-learning effective?
- How do different types of employees respond to e-learning?
- Does the social and cultural environment of the organization have an impact on e-learning?
- With regard to the cost of implementing e-learning in business organizations, is there a positive return on investment?
- How do different professional experts perceive e-learning in the organization?

In short, the evaluation should be (i) systematic, (ii) aligned with business strategy, and (ii) provide details on multiple performance areas.

2 Multi-level Evaluation of e-Learning Effectiveness

Relevant research often indicates that techniques for the evaluation of e-learning in companies are equal to those used for the evaluation of any other solution for employees training. Go-to evaluation model, the Four Levels of Evaluation, is developed by D. Kirkpatrick in 1950 and is used regularly for evaluation of any corporate learning program (Margolis, 2009). The extended version (five-level model) by Strother (2002) is explored in details further in the paper and its relevance and use in evaluation of e-learning is discussed.

In addition to expanding the model, it should be stated that there have been important changes/adaptations in original levels to modern concepts (Ivec, 2014) outlined hereinafter. For example, level I does not measure only employees' satisfaction with the course, but also their engagement and the degree to which they are actively involved and to what extent they really contribute to the overall process. Level II has originally measured the degree to which employees acquire knowledge, skills and attitudes, while today it refers also to acquisition of self-confidence, their dedication and determination in using acquired knowledge. Level III shifted to focus on processes and systems that reinforce, encourage and reward the performance and desired behaviour. Level IV is amended in a way it now includes short-term observations and measurements so the organization can be sure that desired behaviours would lead to desired results.

Before commencing multi-level evaluation of e-learning, an analysis of course completion rates should be performed (Pasterfield, 2014). The rate of completion indicates the number of employees who pass all modules and successfully complete a given course. However, achieving 99% course completion rate is not necessarily an indicator of a successful e-learning program in a company. Namely, if the course is compulsory, employees will have to finish it, regardless of whether they like it or not. This is the reason why it is important to inspect other measures, such as how fast do employees complete the course, whether they finish it in a given period of time, do they recommend it to others etc.

2.1 Level I: Reaction

Evaluation at Level I gives valuable information to a company such as whether employees liked the course, do they consider content of the course relevant and important to their work, do they prefer to go through the course during the working hours etc. (Shank, 2010). Keeping in mind that e-learning is often a whole new experience for the employees, it is important to overcome the natural scepticism and inertia of employees for the success of the whole program (ibid). Evaluation at this level helps in monitoring the acceptance of e-learning in terms of preferences and can be crucial in collecting information and statistics that will generate a positive atmosphere related to e-learning (Horton, 2006). The best way to understand the reaction of employees is to include a detailed feedback system in the form of surveys, questionnaires, etc. Organisation's LMS could be used to pose brief and concise questions essential for the success of program (Anand, 2014).

2.2 Level II: Learning

Evaluation at Level II is related to the efforts of the organization to determine how the skills, knowledge and attitudes of their employees have changed after completion of the course. In addition to al typical tests used to examine the learning, development of the critical thinking is being increasingly emphasized in recent times. Nimritta (2015) suggests that evaluation of learning should be implemented in a manner that organization measures the level of knowledge of employees before (to determine the starting point), during (allowing self-assessment and measuring progress) and after (providing real information about what was actually achieved) the course. Apart from assessments and tests, evaluation at this level includes monitoring of key indicators during the course (such as how fast the employees progress through a particular module, the number of times they have signed in, whether they participate in online discussions, etc.). This information can be used for a wider evaluation of the training program in order to improve some of the aspects of program and to make it more "usable". Combining the information gained through evaluation at this level, analysing the performances of the employees and detecting areas of difficulties or lack of interest, can help to significantly improve e-learning courses by personalizing them and constantly working on keeping the attention of employees and ensuring effective learning (Anand, 2014).

2.3 Level III: Behaviour

Change of certain behaviour at work is certainly the main goal of the most business e-learning programs, but measuring those changes is an extremely complex task. According to relevant research (Bregman & Jacobson, 2000; Hall & Lecavalier, 2000) there is a significant correlation between measuring changes in behaviour and achieving desired business results, which implies that focusing on the evaluation at level III is the strategy that brings the best results and allows identification of those aspects of e-learning which are actually effective (Strother, 2002). When it comes to the performances of employees that can easily be quantified, then it is necessary to compare the figures or values "before" and "after". In other cases, evaluation at this level may require a more detailed observation and analysis of the behaviour of employees, which often includes assignment of the manager or an employee to the role of "supervisor". Supervisor works closely with employees, monitors them and is able to assess their behaviour before and after the training (LaMotte, 2015). Assessments at this level can also be performed by using real-life scenarios/tests where the employee is required to react. Their reaction is then evaluated, i.e. use of knowledge to solve certain problem is inspected in order to determine the extent of acquired knowledge (Anand, 2014). Furthermore, to evaluate e-learning at this level it is useful to link data from LMS (learning analytics) with other information systems within the organization. Information systems record data that directly measures the performance of employees or from which it can be easily deducted (Horton, 2006): e.g. Human Resources Information Systems may reveal patterns of promotion, demotion and performance of employees; ERP systems may reveal patterns of their efficiency and effectiveness; CRM Systems can detect change in acquisition of new clients; project management tools can demonstrate employees' ability to achieve a project objectives within set time frames etc.

2.4 Level IV & Level V: Results & ROI

Evaluation of the overall results of e-learning is very challenging, as it attempts to measure the results of training and learning and extent to which they directly affect business organizations (Strother, 2002). While reduced costs, increased production, lower rates of absenteeism of employees and lower rate of employee's job cuts and their replacement with new ones are desired results of e-learning (ibid), many companies do not carry out this complex evaluation task and consequently fail to prove the link between (e-)learning programs and improved business results. Level IV indicators are often already available in companies' reporting systems (e.g. changes in performances in the company or specific unit, and social, environmental and other effects) while the challenge is to connect

the existing indicators with employees' performances (Webanywhere, 2014).

Level V, also known as "ROI Level" has been advocated by J.J. Phillips, world-renowned expert for measurement, evaluation and assessment. Data collected by conducting evaluation at ROI level represents the value of e-learning program in strict, financial terms. To calculate the data, results obtained from the fourth level evaluation are converted into monetary value and then compared with the cost of the entire e-learning program.

Measurement of financial and business outcomes is demanding, challenging and requires a lot of time, especially having in mind that a lot of benefits arising from this investment are intangible by nature (Horton, 2006). Nonetheless, this evaluation is very important, because without properly measured results and ROI, there will always be doubt whether an e-learning program was effective or not. As in any other evaluation, before making an evaluation plan and starting with data collection, it is important to define what the successful result really is. Measures associated with this level refer also to change in performances in a company or specific unit but now as a function of the total cost of (e-)learning program (Shank, 2010). The challenges in defining specific benefits of e-learning in relation to ROI at level V arise from following issues (Bower, 2011):

- it is difficult to isolate and quantify the impact of e-learning program on the performance of an employee from all the other influences such as leadership, infrastructure, etc.;
- it is difficult to link improvements in employee's performances directly with quantifiable business results; and
- benefits are mainly intangible – they are usually a result of cost cuts, increased customer satisfaction, etc.

Starting from the comprehensive multi-level framework presented in this chapter and related mechanisms and performance indicators, we sought to assess the awareness and the extent of use of various e-learning evaluation tools among Croatian companies. Results are presented in the following chapter.

3 Analysing Trends in Evaluation of e-Learning Programs in Croatian Companies

The aim of the research was to analyze the current situation in the Croatia in terms of awareness and use of methods, techniques and ways of evaluating the e-learning results in companies, as well as to indicate the prevailing attitude of key personnel in charge of making decisions on related issues.

3.1 Research Participants

During December 2015 and January 2016, the online survey using SurveyGizmo tool was collated (by sending a survey link via e-mail directly to target individual) to employees in selected Croatian companies.

Due to the fact that expert knowledge and previous experience was required from the participants, the sample was compiled based on lists of people that participated in national conferences related to e-learning in corporate settings, thus demonstrating interest and expertise in this area. In total, employees from 69 companies participated in this research, yet 23 of them were disqualified due to the fact that they do not use e-learning to set extent. The majority of the surveyed companies are from ICT-related sector, i.e. 32.6% of the total number, followed by financial and insurance sector (13%), other service activities (13%), manufacturing (10.9%) and so on. With regards to size of the company, employees from companies of all sizes responded, but the majority were from organizations with 1-49 employees (39.1%), followed by large ones with over 250 employees (28.3%), then organizations between 100 and 249 employees (19.6%) and then between 50 and 99 (13%).

Among survey participants, employees from Human Resource departments dominated, followed by CEOs or owners, IT managers and heads of IT departments, and other experts in training, education and professional development of employees. All the participants were familiar with the issues related to implementation and evaluation of e-learning systems, and were involved in related decision-making processes.

3.2 Research Results

To begin with, 63% of companies that have used e-learning as a tool for training of their employees, monitored completion rates of their e-learning courses, while a slightly lower number (54.3%) monitored whether their employees manage to complete a specific course within anticipated time frame, as well.

Given the fact that the questionnaire was created based on theoretical assumptions given in Chapter 2, questions are formed in a way to inspect the use of e-learning evaluation methods and techniques per defined levels. Thus, evaluation at level I, reaction of employees on the course, is carried out in 54.3% of companies, while implementation methods vary from: (i) assessing satisfaction with the course (80%), (ii) providing opportunities to employees to express their opinions, comments and give suggestions related to the course (64%), to (iii) estimating the perceived value of the course and its relevance for employee's work (56%) and (iv) self-

assessment of employees in terms of how well do they think they have learned specific content (56%).

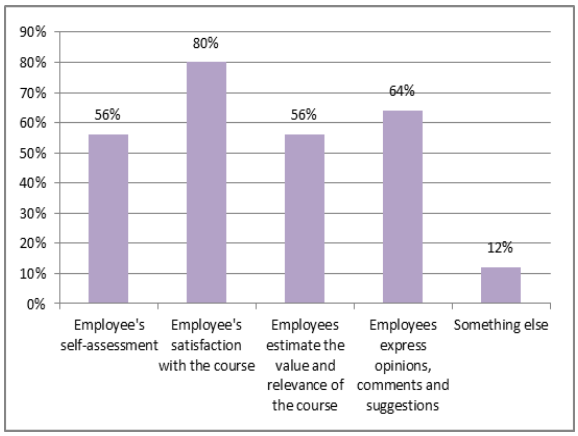

Figure 1. Methods used for evaluation at Level I

The evaluation at level II, i.e. learning evaluation, is used by 55.6% of surveyed companies, and, in majority of cases (88%) it is carried out after completion of the course in order to determine the level of learning and understanding. About 56% of companies perform evaluation of employee's knowledge at the same time the course is performed (through partial tests and quizzes), in order to give employees possibility to track their progress in learning, while 40% of companies evaluate learning also before the beginning of the course, in order to determine the starting point and level of knowledge before taking the course. Testing is mainly carried out using questions that require recall and retrieval of critical or routine information, whereas the use of complex adaptive tests (where questions vary depending on preceding answers of employees), simulation and observation of employees in given situations, is still not frequent.

Slightly more than half of surveyed companies (56.5%) replied negatively to question related to performing evaluation at level III, i.e. evaluation of use of acquired knowledge and change in behavior of employees. Among those respondents who have confirmed they evaluate e-learning program at this level, simple methods such as employee self-assessment of their own performance and progress and assessment of the employee's performances in relevant situations carried out by managers or other employees prevailed. Complex methods, such as the assignment of "supervisor" roles and using learning analytics data with other systems within the organization and analysis of resulting changes, have been used rarely or not at all.

The evaluation of the overall results of e-learning program, defined as evaluation at level IV and use of financial analysis of e-learning investments in a company resulting in calculated ROI, defined as evaluation at level V, are of crucial importance and can significantly affect decision-making processes as is emphasized earlier in the paper. Yet, evaluation of the overall results of e-learning course is carried out in only 39.1% of companies in our sample. This score has, once again, confirmed the results of earlier research (Arthur et al., 2003; Shank, 2010), where evaluation of overall results of e-learning programs is often not performed at all, despite its importance.

Among the companies that evaluate overall results, the majority (72.2%) monitors changes in the whole organization or in a specific unit as a result of using knowledge acquired through an e-learning program, while slightly over half (55.6%) monitors social, environmental and other benefits incurred as a result of using e-learning courses. Proportion of companies that monitor changes in performance as a function of total costs (represented by ROI) is very low (33.3%).

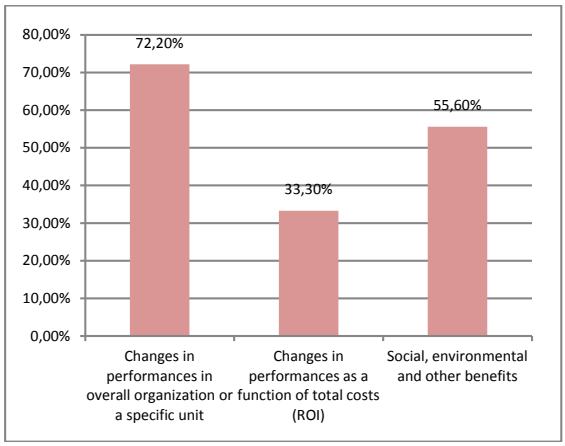

Figure 2. Methods used for evaluation at Levels IV & V

Generally, the main impediments to use of various e-learning evaluation tools are inadequate resources and lack of time, this being confirmed by 54.4% of survey respondents. Another important issue is a pure lack of interest in the results by managers (37.8%). Managers should show interest in the results and support the overall program, because their attitude towards the e-learning program affects general acceptance and attitude of employees. Managers are by default decision-makers, and they are the ones who should insist on e-learning evaluation at this specific level (Smolen, 2009).

As another important issue, respondents identify the fact that evaluation of results is not included in implementation and evaluation plan from the beginning of the process/project (33.3%). It is a common situation that evaluation is seriously considered only after the project is implemented, when it is already too late for effective evaluation (Elkeles, Phillips & Phillips, 2015).

In addition, for 33.3% of respondents, the lack of specific knowledge (in terms of possibilities and

tools for e-learning evaluation) is a significant barrier. Inability to provide or inaccessibility of relevant information for high-level e-learning evaluation is identifies as a problem for 24.4% of respondents.

Nonexistence of quality evaluation and analysis, that would confirm whether the investment in e-learning is justified, consequently leads to disappointing information: our research confirmed that over 50% of companies believe that their expectations either have not been met at all or they are not able to assess whether these have been met.

To inspect the link between the level of knowledge about the techniques for evaluating the effectiveness of e-learning efforts and the level of implementation/usage of those techniques, inference statistical tests were performed. Statistically significant correlation (C=0,283, $\alpha^*<$ 5%) is found between the level of knowledge about the techniques for financial cost-benefit analysis of e-learning (i.e. Level V evaluation) and the implementation of related financial cost-benefit analysis within the company.

In addition to that, analysis of the questions where participants ranked their knowledge and the application of evaluation methods by default scale from 1 to 5, was carried out. To test interdependence between the level of knowledge about the techniques for evaluating the effectiveness of e-learning and its application in companies, Spearman's rank correlation coefficient was used. The existence of a correlation between knowledge and application of specific techniques was separately tested for each of the levels of evaluation. Spearman's rank correlation coefficient between the knowledge and application of methods for each of the levels was positive ($\alpha^*<5\%$), indicating that with the increase in knowledge about the techniques at any level, an increase in the application of those techniques can be expected. Spearman's rank correlation coefficients by defined levels (listed and elaborated in more detail in Chapter 2) were:

- Level I: 0,676;
- Level II: 0,730;
- Level III: 0,630;
- Level IV: 0,425.

Also, statistically significant correlation (C=0,394, $\alpha^*<5\%$) is found between the implementation of evaluation of the overall results of e-learning and meeting the expectations of the investment in e-learning in companies.

It is very likely that the companies whose expectations from investing in e-learning were met would continue with activities in this area, while the other companies, driven by clear benefits and the potential would join, resulting in wider implementation of e-learning initiatives in Croatia.

4 Discussion and Conclusion

Managers are constantly searching for new solutions and ways of exploiting ICT in order to remain competitive and successful. When investments in ICT are concerned, the initiatives to introduce e-learning (covering both the systems and the content) are experiencing exceptional growth. In those circumstances e-learning is used as a tool to improve company performance and is viewed as a logical solution to all managers that want to decrease the cost of staff training and improve final learning outcomes of a training program. Since programs for in-house e-learning are fairly new, it is clear they are faced with skepticism, increased caution and often distrustful attitude by managers and employees of the organization.

Intangible nature of the costs and benefits associated with investment in e-learning make the ROI analysis increasingly complex. At the same time, managers do not have the tools or knowledge to define causal link between the investment and the impact on the productivity and profitability of the company. All of this results in a situation where companies do not perform systematic evaluation of the benefits and outcomes from this investment. E-learning should be planned in a way that supports strategic goals of the organization, while overall implementation plan should also plan for thorough evaluation of accomplished results. Only then, managers can make a judgment whether or not expectations from the investment have been met. The evaluation must be performed on all levels starting with the evaluation of the reaction of employees, through knowledge, changes in behavior of employees, to the overall results and financial feasibility. The results then inform subsequent e-learning related decisions and strategy (re-)formulation.

Present analysis of level of awareness and use of methods and techniques for the evaluation of e-learning, pinpoints number of issues hindering wider use of the techniques and reveals attitudes of people involved in the decision-making process related to e-learning. Unfortunately, the analysis confirms that companies in Croatia are still not familiar to a satisfactory level with the possibilities for e-learning evaluation, this supported by modest numbers of companies that use higher-level e-learning evaluation in the terms of the scope and diversity. In addition to insufficient knowledge of the techniques, insufficient time and resources and lack of management interest in the results are also explained as being the main obstacles to wider evaluation. Unsurprisingly, lack of systematic evaluation leads to a discouraging fact, i.e. majority of the companies that participated in the survey believes that their expectations have either not been fulfilled or are not able to conclude firmly.

By increasing the awareness amongst people in charge about the importance of e-learning evaluation, by promoting number of methods for multi-level evaluation and by including evaluation into the e-learning implementation plan from the very beginning, would without a doubt lead to wider use allowing analysis, quantification and clear cost benefit analysis for e-learning investments. Thus, companies are becoming more aware of their competitive advantages and economic benefits that this investment brings. The use of e-learning in Croatian companies will depend on the fulfillment of expectations and proving the profitability of the investments, which is possible only based on the planned, thorough and timely evaluation of the results.

As a part of future research plans, the multi-level evaluation approach presented in the paper will be tested against specifics of tertiary education. Namely, this research has been conducted under the framework of Higher Decision project (http://higherdecision.foi.hr) that aims to develop a methodological framework for decision making in higher education based on one test-case (case of open and distance learning implementation). An important aspect of the project is the evaluation component with the objective to identify and test the tools for evaluation of strategic decision implementation. Higher education institutions after some time adopt and adapt good practices commonly used in profit sector, such as management models (BSC, BPM), entrepreneurial orientation etc. That is precisely why, an in-depth analysis of the e-learning evaluation practices and problems from business sector has been conducted and presented here. Still, there is a major difference between training of employees and teaching students - in academic settings, learning is a core process while an e-learning system is a main asset and an integral tool. Therefore, presented practices provide only a starting point for further research into e-learning evaluation so as to maximise the outcome for students and higher education institutions that are investing significant resources. We find that it is possible to map evaluation practices among the two sectors. A draft outline is given in Table 1 which will be thoroughly revised and detailed out in the subsequent phases.

Table 1. Applicability of the Multi-level e-Learning Evaluation Model to Academic Settings

	Use in business settings	**Applicability to academic settings**
Level I: Reaction	Monitoring the acceptance of e-learning program. Recording individual learning preferences (using surveys, questionnaires, etc.). Collecting various statistics (usage-level).	Fully applicable. Frequently used. Institution-wide.
Level II: Learning	Assessing/testing to determine level of knowledge before, during and after course completion. Assessing development of critical thinking. Monitoring key indicators during the course (progress speed, level of participation etc.). Analysing employees' performance Detecting various issues.	Fully applicable. Frequently used. Institution-wide.
Level III: Behaviour	Measuring change of employees' behaviour by comparing data about learning (learning analytics) with data in other information systems within the organization. Comparing individual performance indicators "before" and "after" the course. Observing behaviour of employees by assigned manager/supervisor. Assessing knowledge in real-life scenarios. Analysing relevant business results (individual level).	Fully applicable. Used occasionally. Implemented by individuals or department-wide.
Level IV: Results	Analysing overall performance of a company or a specific unit. Identifying social, environmental and other effects. Connecting company-level indicators with employees' performances.	Applicable in part. Used occasionally. Implemented by individuals or department-wide.
Level V: ROI	Calculating value of an e-learning program. Comparing the value with the cost of the entire e-learning program.	Applicable in part. Uncommon use. Implemented by few institutions.

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