

The New Learning Strategy of the Dutch Vehicle Authority

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Abstract— This case study is about the new learning strategy of the Dutch Vehicle Authority, a governmental organization. The aim was to examine this strategy, which focused on blended learning, to review the implementation issues and to survey the first experiences with this new learning model in daily practice. The pedagogical model was a mix of theories and new learning concepts with the emphasis on innovation. The developments in the project were permanently monitored and evaluated to judge how the innovation was perceived by the end users, other stake holders and decision makers. This multi-level approach was considered decisive for the viability of learning innovation. The outcome was positive. End users needed less time to prepare for their tests, and more candidates passed their test the first time. The user population was pleased with the innovation at large, but had doubts about the support at medium management level. On the basis of the outcome the management decided to use the new learning strategy as the main approach for learning and training in the RDW organization.

Index Terms— blended learning, vehicle inspection, transport sector, Learning Content Management System, coaching, governmental, evaluation framework

I. INTRODUCTION

The ‘Dienst Wegverkeer’ (RDW) is the home of the vehicle inspection organization in the Netherlands and the central link in the vehicle chain between the automotive sector, government and members of the public. The RDW focuses on safety, technical reliability and a cleaner environment. Under the ultimate accountability of the Dutch government, the RDW participates in the development of international laws and regulations, organizes the issue and registration of number plates and driving licenses. The RDW also grants permits for the admission of vehicles and vehicle components to the Dutch and European market on the basis of technical regulations. Important activities are the registration and information provision: gathering, storing, updating and managing data about vehicles, their owners and vehicle documentation and providing information about this data. The main issue covered in this case study is the innovation of the training and certification process of the employees working at the Vehicle Technical Department and responsible for the inspection and control of companies that are accredited by the RDW to monitor the technical

state of vehicles in connection with safety and environmental requirements.

The employee who inspects the companies, in most instances small and medium sized private garages, needs to be certified to do so. These inspectors constitute a target group of mobile workers, most of the time on the road to control the car inspection work of the garages. They are directed to these garages by the central office, but work rather independently and report to the central and the regional offices using technical devices such as computers and smart phones. The regional office is their work base, where they meet their supervisor and do related work, when no inspection on site is scheduled.



Figure 1. Only certified employees can operate as test inspector

The learning innovation in the Vehicle Technology Division of RDW was primarily executed by the Training and Instruction Division [1,2]. This division is subject to external and internal developments that put a lot of pressure on this training organization. External developments include the increased motor vehicle usage, the changes and greater uniformity in regulations on European and international scale, fast technological changes and improved service quality demands from clients. Internal developments are amongst others the rising average age of the employees and the related loss of knowledge and experience. Thus it became inevitable to acquire more inspection personnel and to train the employees better and faster. It was evident that a profound change in the learning strategy was needed to cope with these increased learning demands.

II THE NEW LEARNING STRATEGY

At the heart of the new strategy with the project name Triple-E, was the need to make training and learning

more efficient, effective and attractive to be able to cope with the challenges, while assuring a high quality standard. The existing current training situation (see table 1) was mainly classroom oriented with retraining and examinations and additional working practices that demanded a large teacher capacity. This training was very much place and time restricted and dominated by the use of traditional learning activities, that did not fit the needed workplace related learning crucial for the changing working practices. In fact the readiness for new employees to start working was very much delayed by this traditional training approach. The new approach should allow for time and place independent learning close to the workplace or anywhere with internet connection with mechanism to support this process like 24/7 access to learning content, self-test tools and the opportunity to use the information as performance support content in daily practice.

The proposition was developed to attain the new approach based on a blended learning approach with a combination of e-learning, practical assignments, coaching and training. In table 1 an overview of the main differences between the 'old' and 'new' situation [2]. At the heart of the innovation is a Learning Content Management System (LCMS) for the storage of content, monitoring of activities, progress and results, a course planning system, exams, user definition, allocation of coaches and module maintenance.

TABLE 1.
DIFFERENCES BETWEEN THE OLD AND NEW LEARNING SITUATION

	Classroom learning	Online learning
Pedagogical method	Instruction and training in the national training center	Online modular content accessible at any time and location
Test	Test at the end of the training course	Tests during and after each module and after a cluster of modules.
Practical tests	None	On the work floor
Student results	After the final test	Ongoing using the LCMS
Coaching and support	Limited	Ongoing
Retraining to renew the certificate	Once every 2 years at the training center	On the job and ongoing

The employees have access to the system via an electronic learning environment for user identification, communication, progress and results, exams and other organizational issues. This includes the development of a personal training plan for which the participant decides about the time, place and pace of the learning activities. A coach guides the employees and monitors how the practical assignments are carried out using the LCMS for administrative purposes.

Essential for the newly developed content are the image based and practically and visually oriented e-learning materials. Theory and practice are combined in such a way that the student can choose either way to acquire the needed knowledge. There is video, visual instruction material, visualizations, simulations, different types of

coursework and the practical assignments linked to the e-learning content. Exams are done in clusters, via e-learning and in practice under the supervision of a coach and an external examiner. In this way the employees can do initial training, retraining and examinations as well as additional training and exams at the time of need and at a higher pace than possible in the traditional training system.



Figure 2. A screenshot of the introductory online module to RDW

The preparation for this Blended Learning solution started in 2008 with the development of the first four modules and the LCMS. The focus in this phase of the project was on compliance courses like an introductory course to RDW, a course about the Speed Limiter and one about Identification. Also an attempt was being made for a course on Integrity to use e-learning in a blended mode to develop social skills. The main focus though was on the development of task related courses that included the theory, skills and practical assignments to acquire the needed certificates for car inspection. Beside the existing training issues, new courses are being developed in line with the introduction of a series of new regulations for which the vehicle inspection organization has a controlling task. The new courses are validated from the perspective of the inspection organization, but also as regular technical courses for which the employee might receive a formal certificate that can be used on the labor market.

The project was monitored and evaluated during a test-phase in 2008 and the first implementation phase of Triple-E in 2009 and 2010 [3]. These evaluations were an important source of information for the decision making process on the integration of this new learning strategy in the overall HR program. A vital issue for HR was the level of acceptance of this new approach by the employees. More about the evaluation you can find in the concluding section of this paper.

III. THE PEDAGOGICAL MODEL

The blended learning concept implemented at RDW is based on several learning theories and concepts. The most important ones are social constructivism, connectivism, level of experience, and (in)formal learning. Although not

all theories are omnipresent in this stage of the project, the model though is the guiding principle for the development of the project.

Social constructivism. Training Models based on socio-constructivist principles seem to work well for informal, practical, ad-hoc-like, spontaneous learning [4]. Core of the constructivist concept is the premise that we all have our own 'mental model' which is developed in interaction with the world around us [5], [6]. The main principles are that each person is unique with regard to knowledge and experience and that people primarily learn by actively trying and learning which always is related to a particular social context. Therefore the learner plays a central role in the development of learning activities with the sole aim to make learning more efficient. As a consequence motivation becomes an important stimulating factor and the individual approach to learning relates very much to the knowledge and experience acquired in the past. The relevance of this concept for the RDW case is that the learning demand of the employer is an important trigger for learning to take place.

Connectivisme. The constructivist approach is a strong advocate for the inclusion of informal learning as part of the learning strategy. This approach is supplemented with the concept of Connectivisme that focuses on the changes taking place in society when it comes to knowledge and learning [7]. The knowledge landscape is changing by the array of new information media, like You Tube, Facebook, Wikis, which emerge in a rather quick pace. In this new situation learning is the ability to connect to different 'nodes' of knowledge, which are spread over a network of data, information and people and is called 'connected knowledge' [8]. This observation is relevant in our RDW case, because the inspectors are increasingly using mobile phones and the Internet in their day to day working environment, which affects their communication patterns, information acquisition, their learning and the development of their social network.

Levels of experience. Assuming that people are unique learners, as conceived in the social constructivist model, they also have a different experience level to be taken into account [9], [10], [11]. Three levels are distinguished: early development, competent and experienced, expert (see figure 3). A newcomer needs good formal and structured learning to acquire basic knowledge and skills in an appropriate fashion. More experienced employees with more knowledge and skills are better served with a largely independent and informal learning situation that better fits the rather ad hoc learning needs, so common for workplace related learning. For people with expert knowledge and experiences, formal and structured learning can even become counter-productive, because it does not fit the very personal learning needs. So in the case of the RDW this means that a well-structured learning program works very well for newcomers, but for the experienced workers one need to rely much more on the self-initiative of the worker to support his or her learning process.

Formal and informal. The distinction between formal and informal is not based on a strict separation between

different learning activities, but the notion that formal education is traditional, class and curriculum bound and informal learning is a predominantly social activity consisting of a mix of learning related actions. In reality we learn all the time, under different circumstances, but apparently more informal than formal [12].

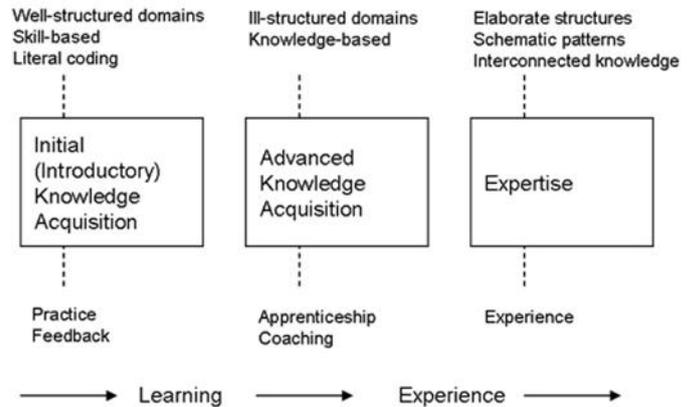


Figure 3. Levels of Experience [10]

The notion of formal and informal learning very much relates to the concepts of social constructivism, connectivism and levels of experience and clarifies that in daily practice an organization can profit from the support of informal learning practices by facilitating independent learning.

The IST and SOLL research issues

The main objective of the Triple-E learning innovation program was the introduction, implementation and maintenance of a digital learning environment to leverage the human resource policy of RDW. This policy was to invest in people on a permanent basis to achieve continuity, higher quality, an improved customer focus, better communication and an international position [1].

The IST situation: the situation as it is.

The main reason for change, as mentioned in the introduction, was the pressure on RDW to make their training more flexible and improve the mobility and employability of the employees. An important element was that the average age of the employees was relatively high and as a consequence there was a relative high loss of experienced and skilled employees foreseen in the near future. The need to recruit new people and train these in an efficient and effective way required a rather flexible system. The existing training facilities and services suffered from a relatively long training period due to unevenly scheduled time periods related to the availability of experts and experienced employees and the rather rigid working schedules of the mobile workforce. An inventory of the main barriers for efficient training showed that the existing training strategy was not very much appreciated by young employees; the quality of the training relied on a small group of selected experts each using a different didactical format and learning materials [1,2]. The learning resources were subject to frequent adjustments due to changes in regulations and legal

issues, which made the preparation of the courses cumbersome and time consuming. For the maintenance and update of the learning materials there was no method available to manage this process adequately, which also meant that beyond the training sessions hardly any updated learning material was accessible for daily use. These barriers prevented the organization from dealing in a satisfactory way with the ISO quality standard and evoked complaints throughout the organization. It was clear that not improving the training situation would lead to a lower quality of services and a reduction of mobility and employability of the employees. Therefore it was decided by the management group to improve the situation and develop efficient training using new educational insights and learning concepts in combination with learning technology. The main strategy in this e-learning initiative was the development of a blended learning solution to come to a realistic combination of theory and practice and increase flexibility.

The SOLL situation: as it should be like.

The anticipated strategy was to develop short and workplace related learning paths for the employees, as a way to facilitate self-organized learning, to stay informed and prepare for new or other work (figure 4). This is in line with the general HR policy of RDW to change the dominant approach of 'learning push' to 'learning pull', to promote self-learning and to create a shared responsibility for employee learning. The belief was that this could make learning more interesting and motivating and thus enhance the employability of the employees in general.



Figure 4 Workplace related learning paths for employees

Blended learning was chosen as a way to benefit from the advantages of online learning like time and place independency as well as employee collaboration and the coaching for better motivation and engagement. The LCMS was combined with newly developed content, which was very much image based, practically and visually oriented e-learning materials. Theory and practice were combined using video, visual instruction material, visualizations, simulations, different types of coursework and the practical assignments linked to the e-

learning content. Exams were done in clusters, via e-learning and in practice under the supervision of a coach and an external examiner. In this way the employees are able to do initial training, retraining and examinations as well as additional training and exams at the time of need and at a higher pace than possible in the traditional training system. The questions to be answered are if this works well enough to achieve the HR goals of shared responsibility, self-learning and ultimately a higher rate of employability.

IV. THE OUTCOMES AND FINDINGS OF THE PROJECT

The development and implementation of the new learning strategy was accompanied by several support actions. One was the pre-test of four e-learning modules (Introduction, Integrity, Control and speed limiter and Identification) in the spring of 2009 by a selected group of employees [2]. This test was aimed at the collection of data concerning the experiences of the participants in using the LCMS, the quality of the learning materials, the coaching, the technology, the hosting and the role of management. Although the e-learning modules covered only a limited knowledge area, the results gave an interesting view on the first experiences of the participants. From the 29 participants 67% qualified the e-learning as good to very good. Only 8% were not satisfied. The assessment of the e-learning modules was 7.7 on a scale of 1 to 10. Interesting enough the business case developed on the basis of this pre-test showed already a cost reduction of 25% compared to the traditional classroom oriented courses, due to the elimination of travel costs, man hours and the use of facilities, like classrooms, restaurant, and such. The main advantages experienced were: the opportunity to learn at your own pace and time; at your place of work; no loss of travel time and the use of the e-learning material as reference while being at work. The disadvantages mentioned were the lack of communication and the fact that asking questions was still troublesome in the system. These comments have been taken into account in the development of the actual system, which is online for broader use since October 2009.

An evaluation framework was developed for recurrent evaluations after the pre-test. The goal was to collect quantitative and qualitative information, partly automated to allow for real time monitoring and successive evaluation [1, 3]. In preparation of this framework several managers, middle managers, and a reference group of employees were interviewed to see what they considered important in this innovation [14]. It became clear that the different stakeholders used different criteria to judge if the project was successful or not. The criteria were organized in five categories: organization, process, content, and infrastructure and business model. The categories then were used as the building blocks for the evaluation, but will not be extensively discussed in this paper. The same evaluation was used twice: directly before the implementation of Online learning and directly

after a majority of employees had gone through their first online learning cycle, including the final tests. 19% of the target group of employees responded in the first round and 40% of the group in the second round, which were 132 people.

The first round of evaluation was important to capture the perception and opinion of the participants about Online learning in general and then capture their perception and opinion after their first experiences. In this way the first round functioned as a reference to see how Online learning was qualified before and after, giving a clear indication of the level of acceptance by the employees.

What follows is a short discussion on the main results of the evaluation. The quantitative data were derived from the LCMS and HR sources. The more qualitative data were collected by means of an online questionnaire for the main user group of employees, consultation of a reference group and interviews with stakeholders using the before mentioned categories as the main outline. In total 132 questionnaires were received, which was 40% of the total number of users. The quantitative information from the user database (see table 2) showed that the participants obviously spend more time to prepare for an examination in the old situation than in the new learning situation (20 versus 10,5 hours). Also the test scores were in online situation a bit better. There is a significant difference in the number of people passing the test the first time. In the new situation 94% pass during the first test compared to 77% in the old situation.

TABLE 2.
COMPARING THE 'OLD' CLASSROOM WITH THE 'NEW' ONLINE LEARNING SITUATION

	Classroom	Online
Learning time (hours)	20	10,5
Test scores	89%	92%
Passing rate	77%	94%

Also the qualitative data show some differences comparing the old and new situation. In table 3 you can see a selection of the main scores. The 'Classroom' column shows the outcome of the questionnaire before online learning was introduced. The 'Online' column shows the results after the employees started working with online learning. Important to know is that the HR policy of RDW stimulates the employees to become more entrepreneurial workers and take more responsibility for their own professional development. This was an important element in the development of the new learning situation and therefore also in the evaluation.

The level of acceptance of the online training was a main point of concern, since the new situation was rather different from the old, but very much appreciated classroom tradition. The figures show that in the perception of the employees the new situation gets a high score right from the beginning on. The training is qualified as even better than the classroom situation, which is remarkable, because the participants were rather

pleased with the existing situation. 69% consider online learning to be a good development. This means that after the respondents had experienced online learning in practice, they were even more convinced. They also qualify the opportunities to develop self-learning, as in de questions on planning, learning materials and organization as important. The notion that the online content is also valuable as reference while at work scores with 78% rather high. Also the believe that online learning helps to improve your level of learning and support independent learning are rated positively. The outcome of the evaluation was presented to the board of managers at RDW, who thereafter decided to go ahead and integrate Online learning in the HR policy as the new way to organize and support the learning processes in the organization.

TABLE 3.
THE APPRECIATION OF THE EMPLOYEES FOR THE ONLINE LEARNING SITUATION

	Classroom	Online
Quality of the training is good	60%	67%
Online learning is a good development	60%	69%
To improve my learning I need to be able to		
a. Make my own planning	34%	52%
b. Select my learning materials	52%	56%
c. Organize my own learning	60%	57%
d. Use online content as reference		78%
Online learning is important to achieve a higher level	48%	61%
More possibilities to learn independently	74%	78%

The Business case

In the decision making process to agree on the integration of Online learning as the main learning model, the business case considerations played an important role [3]. In preparation of the evaluation, managers were asked for their opinion about the criteria they considered important for the succes of the project. Reference was made to these criteria in the evaluation report [3].

On the basis of the experiences in the field, the monitoring of developments and the evaluation, it became clear that in the case of RDW:

- Online learning saves time (and money).
- The opportunity for Learning 24/7 is appreciated by the employees.
- Existing Computer skills are no threshold for using Online learning.
- Employees are satisfied with the quality.
- The use of the LCMS system as a reference is a great success.

These achievements were noticeable in this very first stage of the development of Online learning and reassured that the strategy was successful. This was supported by the insights on the management level were the following issues were of major importance:

- a. Online learning qualified as an integral and supporting part of the HR policy for employability.
- b. End user support was good, but not so much on the middle-management level.
- c. Online learning increased the efficiency and effectivity of training with the right content at the right time.

On the basis of the outcomes of the evaluations RDW decided to integrate the Online learning strategy as the core strategy to develop the Online learning approach and has shown with this initiative to be one of the forerunners among the governmental organizations regarding learning innovation.

IV. CONCLUSIONS

A new organizational structure, new learning processes, new content and new technologies are the ingredients for the new learning strategy of the RDW. The new courses are being developed in line with the introduction of a series of new regulations for which the vehicle inspection organization has a controlling task. This is next to the transfer of the traditional training activities to the new blended learning situation in which online learning is combined with practical training on the job. The new courses are validated from the perspective of the inspection organization, but also as regular technical courses for which the employee might receive a formal certificate that can be used on the labor market. This fits well in the general HR policy to stimulate employability on a broader scale.

This project has an interesting organizational structure with lots of stakeholders and is highly innovative in the context of this organization. The new learning strategy incorporates a fundamental change that needs firm managerial support. Therefore monitoring of the use and the results played an important role in the evaluation of the project. To qualify a project as successful and viable, it is necessary to know the criteria the stakeholder population uses to judge if this is the case. The evaluation therefore focused not only on content and technology, but incorporated organizational issues, business processes and the business model as highly relevant criteria. This holistic approach showed to be decisive for the board of managers which had to decide about the future of this new learning strategy. This reality is often being denied by learning professionals, but decisive for the success of rather complex learning innovations in organizations.

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