

Creating a Positive Attitude towards E-Learning at Work Posts

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Abstract—Establishing e-learning in an organization represents a challenge, especially if most members do not have much knowledge about e-learning. The project should be carefully planned and run in order to create a positive attitude towards e-learning. As the objective of e-learning in the workplace is qualifying employees, focus should be made on the learners' satisfaction and learning results. These can be achieved with appropriate use of web 2.0 technologies, usable e-learning system and constructivist approaches in e-learning, where efficient e-course and well-skilled mentors have an important role. This article describes the model of introducing e-learning in an organization, and its realization in praxis.

Index Terms—e-learning, facilitated e-course, learning at work post, web-based learning, mentors' training

I. INTRODUCTION

E-learning offers several advantages (e.g. flexibility in time and place of learning, active learning, just-in-time learning, learning at an individual pace, catering the specific needs of learners) especially for work posts where life-long learning is important to the employers as well as to employees. In some organizations the up-to-date knowledge of employees is so essential that they have to prove it through regular tests. Employers with employees all over the country or even all over the world have a lot of difficulty with organizing traditional training and knowledge evaluations and can simplify these tasks using methods of e-learning.

Frequently knowledge that has to be obtained at work posts is confidential and/or very specific. As learners may ask questions that need confidential and very accurate answers, suitable mentors should be skilled workers from the same organization. Therefore, the mentors need expert knowledge and experiences as well as pedagogical skills. Many authors recommend constructivist approaches in e-learning [1], [2], [3], [12], where the role of the teacher (e.g., mentor, tutor, instructor, trainer, facilitator) in an e-course is different than in traditional course. Mentors need to be trained to use the technology as well as to use new teaching strategies. Becoming acquainted with the technology is the easiest part of their training. As the use and design of e-learning should not be founded on an existing practice used in face-to-face (F2F) learning [3], the mentors need knowledge in e-didactics as well as practice in performing e-courses. They should use new teaching strategies and support learners' self regulated learning processes (e.g. goal setting, self-monitoring, self-

evaluating, help seeking, time management) to achieve expected learning results. In the organizations, where e-learning is in an initial state, this could be an issue.

This article describes the project of implementing e-learning in The Customs Administration of the Republic of Slovenia (CARS). The goals of the project were:

- To set up the platform for e-learning
- To establish the feasibility of introducing e-learning at CARS
- To create a facilitated e-course using the e-content received from the European Commission
- To train the mentors to appropriately facilitate e-courses and enable them to practice on real learners (i.e. customs officers)
- To create a positive attitude towards e-learning in CARS

An e-course was designed for customs officers using the e-content that CARS received from the European Commission. The e-content was in English (i.e. not in the learners' mother tongue). Therefore some additional problems and questions to mentors were expected.

The mentors' training was made up of a theoretical and a practical part. In the practical part, they had to mentor a group of 50 selected customs officers that learned at their work posts. The mentors worked under supervision and with the help of a mentors' trainer.

We assumed that the success of e-learning depends on the learning atmosphere and learning results. To form an engaging learning atmosphere, we had to obtain appropriate technological conditions (i.e. appropriate platform for e-learning) and suitable pedagogical framework (e.g. facilitated e-course, skilled and enthusiastic mentors). As skilled workers are the aim of all types of training, we focused on achieving a high level of learning. All activities were designed to prevent drop-outs and to encourage learners to gain sufficient knowledge to pass the final exam. Specific objectives of learners' (i.e. customs officers) training were to achieve that at least 90% of them would learn actively and that at least 75% of them would successfully pass the final exam.

This article also presents the evaluation of the project and the results.

II. ESTABLISHING E-LEARNING

A. Project description

The project was carefully planned, to achieve its ultimate goals, with the following stages of implementation:

- An e-learning platform implementation in Slovene,
- Creating an e-course with the English content received from the European Commission,
- Trainings for portal administrators, managers and mentors,
- E-course delivery for a group of 50 employees,
- Evaluations.

This article presents a theoretical framework and a method of implementation.

B. The technological framework

As a delivery system, web-based learning utilizes World Wide Web (WWW) resources to create meaningful learning [8]. As the e-content received from the European Commission is in SCORM format, the web was chosen to deliver learning.

Now, e-learning is evolving with the Web 2.0 as a whole and it's changing to a degree significant enough to warrant a new name: e-learning 2.0 [5]. E-learning mainly takes the form of online courses. As a consequence, the dominant learning technology used today is a type of system that organizes and delivers online courses—the learning management system (LMS). An LMS takes learning content and organizes it in a standard way, as a course divided into modules and lessons, supported with quizzes, tests and discussions [5]. Communication and collaboration are essential activities of the e-course.

An LMS system (i.e. e-learning platform) should enable the use of course creation and delivery tools, collaborative and communication tools, administrative tools, assessment tools and e-portfolios. The system should meet the following demands: usability, accessibility and didactic effectiveness [1].

It is widely accepted that the success of any training program is largely dependent on the learners' motivation and attitude. If a poorly designed interface makes them feel lost, confused, or frustrated, it will hinder effective learning and information retention [10]. Therefore the quality of the user interface is very important. In computer science, quality is often defined as usability. Many researchers are orientated towards ISO 9241-11 quality standards, which define usability by the extent to which specified goals - effectiveness, efficiency and satisfaction are reached in a specified context of use [1]. Further, usability is most often defined as the ease of use and acceptability of a system for a particular group of users carrying out specific tasks in a specific environment. Ease of use affects the users' performance and their satisfaction, while acceptability affects the usage of the product [7].

In CARS, an e-learning platform powered by LMS system eCampus was implemented. eCampus has proven to have excellent usability characteristics [4] and was awarded twice by the GPI (i.e. Gesellschaft für Pädagogik und Information). It received international Comenius-EduMedia-Awards for 2006 and 2007 in the category of the best multimedia educational products.

The eCampus is a web-based application, designed for creating web-based learning contents, different kinds of courses, and carrying out web-based and blended learning. Different tools that give automatic feedback to learners are available, e.g. online questions that return instant feedback and various types of tests. The mentor can offer non-automated or partially automated feedback using collaborative and communication tools (e.g. forums, personal messages, chat). Furthermore, tools that provide feedback to the mentor and/or other responsible people are also integrated into the system.

Key self-regulated learning (SRL) processes such as: goal setting, self-monitoring, self-evaluating, help seeking and time management, which affect learners' achievements and motivational beliefs, are also supported. Learning with the help of eCampus is an active process where the strategy of "learning by doing" leads the learner to cognitively approach and work through the learning material and to connect experience, existing knowledge and new knowledge.

The system keeps records on learners' progress. It grants personalized access to the mentor of the e-course and to the particular learner.

C. The pedagogical framework

It is not recommendable to transfer the existing practice in F2F learning to e-learning. The use and design of e-learning should be founded on a theoretical learning approach [3], as well as on recent research and best practices. Lately, researchers suggest e-learning based on constructivist and socio-constructivist theories of learning [1], [2], [12].

In the last few years, teaching and learning processes have changed significantly. The new teaching and learning process, based on constructivist learning theories, brings in the following shifts:

- From instruction to construction (e.g. problem solving, discovery, collaborative, cooperative learning),
- From teacher-centered, to learner-centered,
- From linear to non-linear.

These theories imply a design, which is learner centered and provoke active learning. In teacher-centered education, focus is on the lesson to be taught. In learner-centered education the focus is on the learner and on the learning process. It is important to know the learner's previous knowledge and experiences as well as his/her needs, motivations and characteristics, such as personal abilities, learning strategies and learning style [1]. The teacher (i.e. mentor) and learners discuss the subject, the learners' understandings and their problems in learning. The learner is guided to find knowledge. However, the teacher is no longer the transmitter of knowledge, he/she is the facilitator and provides support or scaffolds to learners.

The widely adopted implication of constructivist theories is that a learner should be active in an online learning environment. Cognitive activity can be achieved using online questions with instance feedback, online tasks, online tests, discussions, etc.

Many researchers claim that learning achievements depend on self-regulated learning processes of learners (e.g. goal setting, self-monitoring, use of task strategies,

self-evaluating, time planning and management, help-seeking) [13]. Therefore, motivating the learners and supporting their self-regulated learning processes (SRL) is a challenge for mentors. These processes could also be supported by appropriate e-course design.

D. E-course design

However, different categories of web-based tools (e.g., collaborative and communication tools, content creation and delivery tools, assessment tools, administrative tools) that are part of a computer supported learning environment can be used to support SRL [2]. Nevertheless, this support is better when the course is facilitated [6], [8]. Therefore, we designed a facilitated e-course and trained mentors to facilitate learning of their protégés.

In this project a blended-learning course was designed, because blended learning gives an opportunity to take the best of both worlds - traditional and e-learning and enables the development of new and efficient learning strategies [11].

In this article the term blended learning is used to describe learning that combines face-to-face classroom activities, instructor led web-based learning (WBL), and self-paced learning.

Horton [6] offers the following way of course classification:

- Instructor-led (e.g. facilitated) towards learner-led (e.g. self-paced, self-directed),
- Synchronous towards asynchronous.

This classification does not mean that there are only two options to choose from, but rather a range of possibilities between these two extremes [6]. For example, a blended learning course can change its type from instructor-led to learner-led during the learning process. WBL activities are usually asynchronous. Nevertheless, some activities (e.g. real-time discussions, chat sessions, screen-sharing, online videoconferencing) can be arranged through internet synchronously.

Self-directed learners study at an individual pace. They set their own learning goals and deadlines without any interaction with a mentor. Usually there is no interaction with other learners of the e-course although learners can communicate and collaborate according to their own initiative.

The design of a facilitated e-course consists of following activities:

- Designing or choosing learning content,
- Announcing learning goals and expectations,
- Creating a syllabus that lays out a schedule, requirements and activities of the whole course.

Horton [6] suggests a weekly schedule. The schedule determines events (e.g. real-time meetings, videoconferences, chat sessions), readings (e.g. learning contents that learners must read or view) and other activities (e.g. discussions, on-line assessments). In our project all activities had deadlines, and learners could complete them according to their own schedule.

In this project, selected mentors followed the strategies suggested by Horton [6] in order to facilitate learning:

- Creating code of behaviour within the e-course,

- Following learners' work and monitoring their progress,
- Facilitating, motivating, encouragement and guidance of learners,
- Helping learners to progress jointly on the right way,
- Stimulating communication and collaboration among course participants,
- Actively participating, promoting and leading the interactive discussions,
- Providing answers to questions, feedback and recommendations on course activities,
- Evaluating the learners' work,
- Evaluating the e-course.

In the project e-course was designed following described guidelines as a scaffold to learners as well as to their mentors.

After e-course design, the mentors' training started.

E. Mentors' training

Well-skilled mentors could be one of the key factors to a successful e-learning project. With their attitude they could have an influence on the learners' and managers' attitude to e-learning at work posts. Therefore, one of the goals of the project was to train mentors.

The group of mentors consisted of five excellently skilled workers without any e-learning practice. Therefore, mentors had to be trained in using technology and pedagogy. Each mentor learnt to use the CARS' e-learning platform as a learner or as a mentor. In the F2F workshop he/she also gained knowledge in e-learning and e-didactics. Then the hands-on training began. After reading the e-content, mentors started executing e-course for the pilot group of 50 employees. All mentors had the same system account and they acted as a single mentor, although their trainees knew they were a group. They worked according to the schedule that assured all-day support to the learners.

The mentors' trainer acted as an advisor. He supervised their work and gave guiding suggestions when necessary.

Mentors and their trainer met four times. At the first meeting the expected objectives and time schedule of e-course was set. The purpose of the second meeting was to organize and arrange user groups and rights on the e-learning platform. In the middle of the e-course for learners there was a third advising meeting with mentors where the learners' progress was analyzed and specific techniques to motivate learners were introduced. After the e-course the evaluation meeting was organized. The trainer, mentors and CARS representatives evaluated the mentors training as well as the e-course from the mentors' point of view. The results of the examination and statistics made on the opinion polls of learners were also represented and interpreted.

F. E-course delivery

E-course for 50 learners, that followed the method of blended learning, started with 4 hour-long F2F meeting in the classroom. The aims of this meeting were:

- To introduce the mentors,
- To present the learning content and the mode of delivery,
- To emphasize the learning goals,

- To promote the advantages of e-learning (e.g. access 24/7, learn at work posts, learn at an individual pace, multimedia learning, active learning, automatic and non-automatic feedback, asynchronous learning, personal e-portfolio, collaboration and communication with co-workers that work in various locations on the borders),
- To present the e-learning platform,
- To evaluate learners' pre-knowledge by testing.

The duration of the whole e-course was four weeks. After the three week-long facilitated e-course learners had one week for self-directed learning in order to prepare for the final exam.

At the end of the course, we measured the level of knowledge of the learners by testing them. The final exam was organized in the classroom although it could have been arranged using the CARS' e-learning platform.

The learners also had an opportunity to express their opinion on e-learning through questionnaires.

III. EVALUATION AND RESULTS

Various types of evaluation were used:

- Learning results surveys prepared in LMS (e.g. learning statistics, results of learning tests),
- The results of the examination,
- Learners' opinion polls,
- Mentors' opinion polls and interviews,
- Trainer's opinion polls and assessments.

A. Learning and examination results

E-learning content was presented by 255 learning pages full of multimedia (e.g. static images, animations, simulations) and interactive elements. None of 50 learners avoided the training. On average, learners spent 13.6 hours learning e-content. As the learners studied an English version of learning material, the time they needed to understand the content was probably longer.

As shown in Fig. 1 not even one day passed without them visiting the e-learning platform. During the facilitated e-learning there was on average 2,158 page views by 22.4 learners per day. That means that on average more than 96 learning pages were accessed by each user that entered the e-learning platform per day. During self-directed e-learning session mentors were not available, however, on average, still 1,914 pages were accessed by 21.6 learners (45%) per day.

The amount of accessed learning pages and the number of actively involved learners each day, as well as the duration of learning sessions, indicates that learners were motivated and they took learning seriously.

Available communication channels were personal messages and forum posts. In total there were only 34 messages or posts sent by 14 learners. The content of the forum posts was mainly about general learning issues (e.g. technical difficulties accessing learning platform because of computers' specific settings, translation issues) and expert terms (e.g. car search methods, reservoirs, campers, airbags etc.). The amount of messages and posts was lower than we expected, although mentors had encouraged communication. This fact opens questions for further investigations, such as: are learners from the CARS not used to using Web 2.0 technologies and the modern kind of communication, do they rather communicate in a

traditional (i.e. face to face) way, do most of them rather learn individually, etc.

At the end of the e-course the learners took the exam in the classroom. The average result of the exam was 93%. This evidently proves high expertise of learners and demonstrates effective e-course.

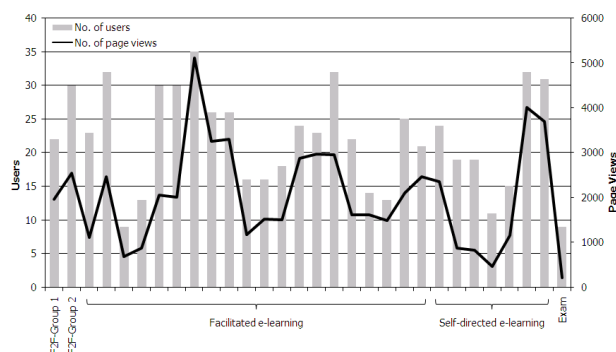


Figure 1. Daily statistics of learning activities – during the facilitated e-learning each learner visited more than 96 learning pages per day in average.

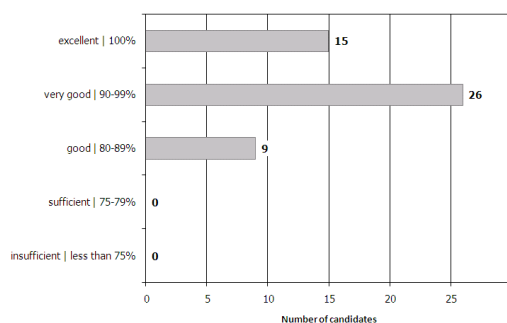


Figure 2. Results of final exam – an average score was 93%.

In Fig. 2 the frequency distribution of learners' scores is presented. No one was graded under the passing score which was 75%.

The relationship between learning time and exam score was analyzed. The correlation showed a strong relationship between those two variables. This means that CARS officers that spent less time learning also achieved lower test results.

Final exam stimulated candidates to take the entire e-course seriously. Nevertheless very high test results, much better than the pre-test results, lead to the conclusion that the e-course improved learners' knowledge and confirmed the chosen e-content, e-course design and delivery as effective.

B. Learners' opinion polls results

After the exam learners were asked to answer the opinion polls which consisted of questions provided by the European Commission and by the project group as well. Questions in the poll were organized into 11 sections.

One of the intentions was to receive information about e-learning location. Most of the CARS officers (i.e. learners) studied during their working time, many of them learned also at home. Only two of them revealed they spent more than 80% of learning time at home. Some of them had some technology issues accessing the platform. The answers also showed that 96% of learners were

familiar with the basics of the learning material (i.e. car search) before taking e-course.

The results of the opinion polls indicated that the majority of learners was satisfied with the e-course. They found it user-friendly and functional. The instructions were clear and indicative. 75% of the course participants assessed the length of e-course as appropriate. Mentor service was evaluated as very efficient, the same stands for face-to-face meeting at the very beginning of the e-course. Also the learning method (i.e. facilitated e-course) was evaluated as convenient: the highest rated advantage was self-paced learning, very high scored were also animations and communication with mentors and other participants.

C. Mentors' opinion polls results

Mentors answered a specific opinion poll. In the section about the benefits of e-learning the greatest emphasis was made on the following answers great value of gained knowledge, transfer of best practice, establishment of same fundamental level of expertise among trainees, training cost effectiveness, better learning time distribution and getting used to modern ways of learning. The key improvement propositions were to extend the functionality of built-in e-tests with a provision of feedback, to update the content, to translate content in Slovene language and to enhance the content with video clips.

D. Conclusion

Establishing e-learning means the introduction of new technologies and a new way of thinking about learning and training. For this reason the introductory stage of e-learning implementation should be well prepared. Creating a positive attitude of all stakeholders has to be one of the main goals. It could be attained by qualifying and satisfying employees using e-learning methods. Therefore the focus should be made on the learners' satisfaction and learning results. We believed that these can be achieved with appropriate use of web 2.0 technologies, usable e-learning system and constructivist e-learning approaches, where efficient e-course design and skilled mentors have an important role.

The general objectives of our project evaluations were to check if the goals of the project were achieved, e.g. setting up the platform for e-learning, establishing the feasibility of introducing e-learning at CARS, creating facilitated e-course using the e-content received from the European Commission, mentors training and creating a positive attitude to e-learning in CARS. Additional objectives were to test appropriateness of the chosen e-learning methods, the use of English e-content in CARS, to reveal difficulties of the e-course and to recommend improvements.

The learning results proved that the chosen method of mentors' training, e-course design and e-course delivery proved, through learning results was effective. The e-content also confirmed its practical value.

The majority of the participants evaluated e-learning to be appropriate and satisfactory. They highlighted the advantages such as free choice of learning time, learning at their own pace, the content itself and the possibility to monitor their own progress.

We can conclude that all goals were achieved and that the project was implemented successfully as a result of commitment of all participants.

Valuable experience was gained. The benefits of the properly delivered e-course confirmed the plan of using e-learning methods to train employees in CARS. The experience gained and the evaluation results have been used to improve further implementations.

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