

Darko ŠČAVNIČAR*, PhD
Military Schools Centre, SAF

E-LEARNING IN THE SLOVENIAN ARMED FORCES - FROM ITS FIRST STEPS TO ITS WIDER USE

Abstract

E-learning (EL) as part of the information society has, both within the Slovenian Armed Forces (SAF) and the Ministry of Defence of the Republic of Slovenia (MoD), been facilitating the acquisition of knowledge through the world wide web, encouraging innovation and the creativity of participants, and, at the same time, enabling better responsiveness and adaptability of training in terms of place, time and subject matter, which can be adjusted to individual needs.

The basic aim of the EL integration in the SAF/MoD was to establish a virtual classroom, which would enable the exchange of on-line knowledge and access to all members of the defence system, both at home and abroad, who have expressed interest in using the contents offered by EL.

The major part of e-learning presently used in the military education and training system has been designed as combined education, where the information and communications technology (ICT) serves solely as a means of help for traditional education, delivery of learning material, and communication between participants and education providers.

Self-study is conducted in the form of on-line courses (e-courses) without the presence of a tutor or a teacher. The users can freely choose the place and time of their study obligations, be it at work, at home or abroad. This form of education has proved highly suitable for the entire defence system by enabling simple use of and access to e-courses through the E-learning Centre website (<http://cei.mors.si>).

Key words: *E-learning, self-study, electronic classroom, e-courses, E-learning Department.*

* Darko Ščavničar is a member of the Slovenian Armed Forces (SAF) and has been specifically involved with military education and training. As the current *Head of E-learning Centre* at the Military Schools Centre of the Slovenian Armed Forces he is engaged in the management, planning, use and maintenance of the EL system, and also participates in the teaching process of military education and training. Together with his colleagues, he has successfully introduced E-learning in the SAF, thus enabling exchange of knowledge for all members of the defence system. The text contains the author's personal opinions exclusively.

»There is no one giant step that does it. It's a lot of little steps«.

Peter A. Cohen

E-LEARNING

The state-of-the-art e-learning is embodied in online learning, which derives from on-line interactive and multimedia-supported teaching materials (that are not equal to materials delivered through e-mail or downloaded from a website). Such e-materials or related electronic educational systems enable effective learning, online assessment of knowledge, and synchronous or asynchronous communication among participants.

In other words, e-learning is any form of education using information and communications technologies. There are different combinations of didactic forms of e-learning, namely: distance learning, online self-study, webinars, combined education etc. All these forms of learning encourage the e-learning process as a set of cognitive processes within an individual.¹ It can be carried out as distance learning and also in the classroom in the presence of the teacher and students. It can be organised as self-study or as interactive learning.

Distance learning is a form of education carried out at a separate location, away from the teaching site, and demands specific techniques for designing teaching materials, instruction and communication through ICT, as well as a special approach to the arrangement of all organisational and administrative matters. Distance education is, hence, appropriate as a supplementary form of education and training, knowledge revision and updating, familiarisation with individual special topics, browsing for answers to concrete questions, and as a replacement for regular education in emergency situations, when regular forms of education cannot be provided or due to absence of participants for health reasons and other activities.

The main advantages of distance education lie mostly in the adaptability to participants' restrictions in terms of place, time and ability (participants may freely choose their tempo), the possibility of self-study, the design of materials by the best experts, the possibility of on-line revision and updating of materials (access to current data), and the use of computer services: storage of learning topics, editing, searching, processing, presentation...

The disadvantages of distance learning are the following: less control of participants (participants must be self-disciplined), organisational matters, lack of social impact of the group and educational component, the skills of participants for using technology, the price of individual technologies, the equipping level of participants, copyrights, privacy and security matters etc.

Online self-study means learning from e-materials without the presence of a tutor. The main goal of such education is to enable users to have access to pre-designed high-quality materials. The teaching process in this form of learning is carried out by means of technology. It is suitable for short forms of education and highly motivated individuals.²

Combined education links conventional and e-learning. E-learning can also be guided; participants may decide for self-study, or both strategies can be combined. Through the concept of combined education, participants and tutors may utilise the best from both worlds (physical and virtual).³

INTRODUCTION OF E-LEARNING IN THE SLOVENIAN ARMED FORCES

Today, e-learning (EL) as part of the information society, and, hence, the Slovenian Armed Forces (SAF), facilitates acquisition of knowledge through the world wide web, boosts the innovation and creativity of participants, and, at the same time, allows for better

¹ A. Ošlak, *E-classroom and its good practice in the implementation of training programmes in the police force*, Discussions on e-learning in the police force (research publication), Ljubljana 2014, p. 67.

² J. Lapuh Bele, B. Jarc, A. Škulj: E-learning in practice (<http://www.b2.eu/LinkClick.aspx?fileticket=P%2BKqOT0Rco0%3D&tabid=1049>, downloaded: 6 November 2014).

³ Ibidem.



responsiveness and adaptability of training in terms of place, time and content that can be adapted to individual needs.

E-learning was introduced in the SAF/MoD on the basis of the Target Research Project entitled *»Slovenian Armed Forces' e-learning and training systems and studies, and possibilities of distance learning introduction«*. The project was financed by the Ministry of Defence of the Republic of Slovenia and the Slovenian Research Agency.

The basic aim of introducing EL in the SAF was to set up a virtual classroom that would enable distance knowledge exchange and would be accessible to all members of the defence system, be it at home and abroad, who had expressed interest in using the contents provided by EL.

The advantages of EL are the following:

- Enrichment to and greater attractiveness of the education and training process,
- Enabling teachers and instructors the design of education and training materials to be available to a target group through the education and training process,
- Reduction of absence from work,
- Cost reduction.

The project for EL introduction in the SAF/MoD was carried out in three stages encompassing the following activities:

- Development of the concept of EL introduction and implementation in the SAF/MoD,
- Preparation and conduct of staff training involved in the implementation of the EL integration in the SAF/MoD,
- Development and integration of the existing contents in the EL SAF/MoD system.

The project included several activities leading to the following results:

1. In-depth analysis of the e-learning teaching approach and concepts:
 - Analysis of teachers and participants, selection of SAF topics and teachers to be included in the development of individual subjects⁴,

- Workshops on adult education and teaching topics for lecturers⁵,
 - Drawing up of plans on the implementation of subjects in the form of e-learning (as a means of support to lecturers in the preparation of scenarios),
2. Specification of the upgrading and development of established standards (SCORM⁶) in support of didactic concepts and interoperability with NATO,⁷
 3. Advising on the establishment and upgrading of open-source LMS,⁸
 4. Creation of development testing environment,
 5. Development of selected subjects in the form of e-learning in English and Slovene languages (2 x 40 hours),

included a detailed survey conducted among teachers and participants on the basis of several questionnaires as well as further processing of result evaluation. The analysis involved 90 teachers and 170 participants of e-learning in the SAF. The aim of the research was to assess the equipping level of e-learning participants, their ability to use computers and computer solutions, and the frequency of internet services use. In addition, the survey provided an analysis of the frequency of using individual teaching methods and their suitability for participants and their learning styles.

5 Teachers and tutors of e-learning also attended advanced forms of training, which was well received among the participants, who rated the applicability of training with a good 4 on a five-level scale. Participants acquired additional skills that could be utilised in the design of teaching materials from their area of expertise for the purposes of e-classroom.

6 SCORM (Sharable Content Object Reference Model) is a collection of standards and instructions for online e-learning. SCORM also defines the methods of generating ZIP files. SCORM was developed by Advance Distributed Learning - ADL on the initiative of the US Department of Defense.

7 A concept of content interoperability was generated on the basis of the SCORM standard, according to which all e-learning topics of the SAF e-learning system should also be created in SCORM form.

8 Different learning management systems (LMS) were tested in the adoption stage to the evolving international standards of e-content work. Among them was also the open-source education and e-topic management system, LMS Moodle, which has been gaining in the number of users of LMS systems. Moodle itself offers a quite complex and sufficiently user-friendly environment. Consequently, this stage of research included testing of the export of e-contents directly from Moodle in the form of Sharable Content Object Reference Model (SCORM) packages. Through the actual work, the situation of the proposed SCORM standard upgrade and support provided through various standards by LMS systems and text editors were verified as well. Arh, T.: Analysis of existing e-learning standards, development of upgrades and relevant links to didactic approaches. IJS, Laboratory for open systems and networks. (<http://cei.mors.si/mod/folder/view.php?id=6787>, downloaded: 10 November 2014).

⁴ Analysis of e-learning teachers and participants was carried out during the first stage of the project and it

6. Design of the operations and troubleshooting manual in Slovene and English languages,
7. Design of tutor's handbook in Slovene and English languages.

The selection and development of the EL system was based on the following premises:

- EL system represents only the qualifying condition (tool) for the implementation of distance education,
- EL system must meet the set criteria and must be simple to use,
- Continuous support for the introduction of new systems – users should not feel the difference.

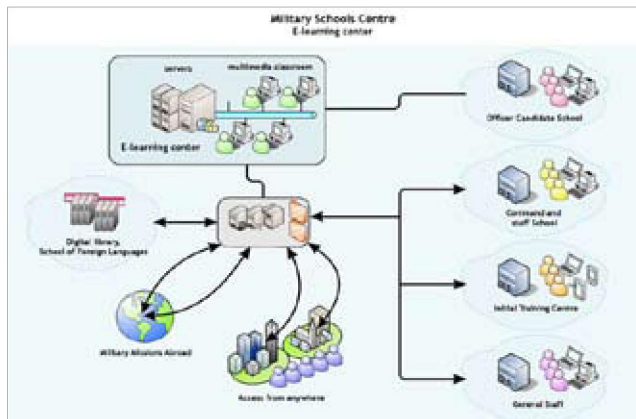


Figure 1. EL organization in the SAF

TECHNICAL CAPABILITIES

In view of the selection criteria, a decision was reached within the SAF for the operation of e-classroom based on the open-source Moodle environment that was slightly adjusted to SAF requirements. The adjustments referred primarily to the form and restrictions of user rights. The applicative part of e-classroom is based on the virtual environment of Windows 2003 Server. The base used is MySQL.

The Kadetnica Military Post (VOK) server cluster consists of 2 host servers, IBM System 3650 with a total of 60 GB RAM, and SAN 2-processor storage unit VNX 5300 with a total of 2.3 TB space on RAID-5 (current capacity – may also be expanded).

The hosts are placed on the VmWare ESXi 5.0 platform and are not accessible from the external network. Full live redundancy of both hosts is ensured. The

management and control of the entire cluster is only possible from the internal network via the V-Centre of the server.

Table 1. Technical characteristics of the system

| | |
|------|---|
| Host | IBM System 3650 |
| RAM | 24 GB |
| CPU | 8 x 2,992 GHz Intel Xeon CPU 5450 @ 3 GHz |
| OS | ESXi 5.0.0.- 496512 Standard |

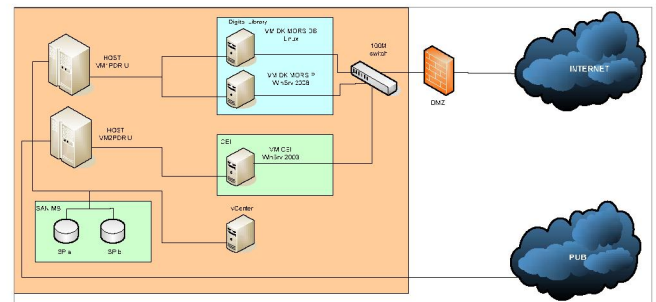


Figure 2. Layout

ASPECT

The major part of e-learning in the military education system is being designed as combined education, where the information and communications technology (ICT) serves solely as support for traditional education and the means of delivery of learning materials and communication between participants and education providers.

Combined learning

The teaching materials designed for combined learning in the e-classroom of the E-learning Centre (CEI) are being prepared by the personnel conducting military education and training (VIU). These primarily include teachers and tutors from the organisational units of the Military Schools Centre, and, also partially, other members of the SAF and employees of the MoD as well as external teachers involved in the VIU system. In contrast to self-study courses, combined learning demands active participation of the teacher throughout the education and training process.

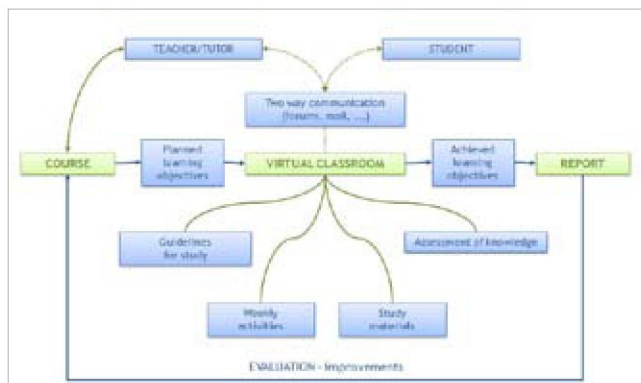


Figure 3. EL organisation chart

Self-study

Self-study is carried out in the form of e-courses without the presence of a tutor/teacher. Its users are free to choose the place and time of their study obligations, be it at work, at home, or abroad. This form of education is highly appropriate for the entire defence system, as e-courses can be used and accessed simply via the CEI website at <http://cei.mors.si>.

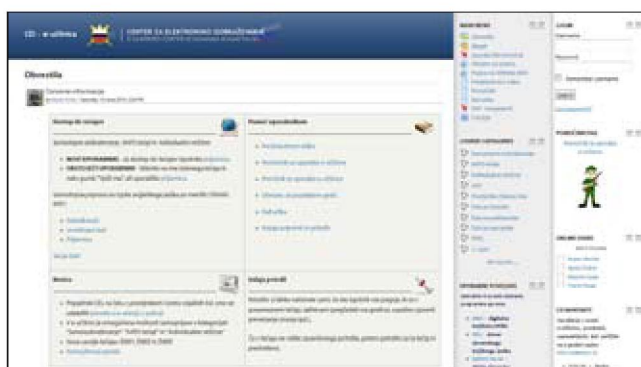


Figure 4. CEI – E-classroom

Moreover, the EL service is designed for individual on-the-job training (UPnD) and functional training, where individuals can, through the information means, become familiar with individual UPnD topics, take tests of prescribed knowledge, and access electronic distance learning sources through internet links. Considering past experiences from the incorporation of e-learning in the defence system, the introduction of e-learning in the SAF was both sensible and highly required. The needs and requirements of users, and the specifics of the target environment clearly demand the introduction of up-to-date information

and communication technologies and multimedia in the process of military education and training.

On the basis of the attained results, we have decided to conduct courses for the users of information solutions aimed at improved qualification level, efficient use of information solutions, and, consequently, long-term improved data, since the granting of access in the future will be conditioned on successful completion of e-learning.

In pursuit of a wider application of e-learning, CEI provides continuous training for teachers, updating of its software and promotion of the opportunities offered to the military and other interested parties through the available tools. The training of teachers and education providers lasts 14 days in a combined form. The introductory and the final sessions are carried out live, while the rest of the learning process is carried out in e-classroom.

The training includes the following topics:

- E-learning and e-classroom basics,
- Procedures to be applied by teachers in designing subjects,
- Use and development of individual study resources and activities,
- Assessment methods,
- Organisation of group work.

Content development

The concept of content development designed for the needs of e-learning in the SAF is derived from target environment specifics. The major focus lies in the development of one's own topics meeting specific military training requirements, thus enabling their exchange and application in different environments. The self-study courses designed in this manner (usually in accordance with the SCORM standard) are closed sets. SCORM consists of several components or SCOs. A SCO (Sharable Content Object) is a group of related resources representing a complete unit with teaching contents and a basic component of a course. It may take the form of one lesson, chapter, page etc.

Users sign up for courses individually, irrespective of the place and time, fulfil the prescribed obligations and receive certificates of course completion. This type

of e-learning is particularly suitable for content where participants are required to revise their knowledge periodically. E-courses are developed within the framework of the available software tools of the SAF and human resources without the presence of subject matter experts.

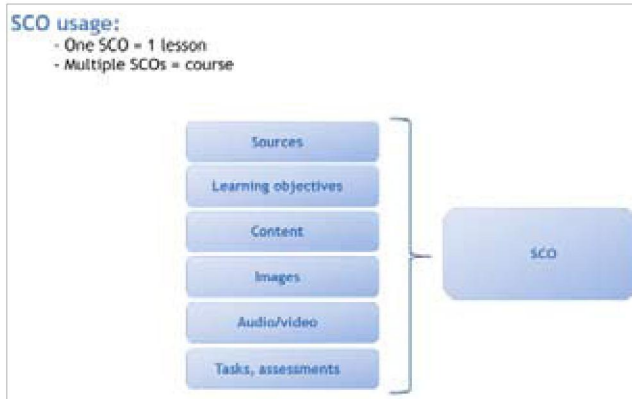


Figure 5. Structure of SCO course (Sharable Content Object)

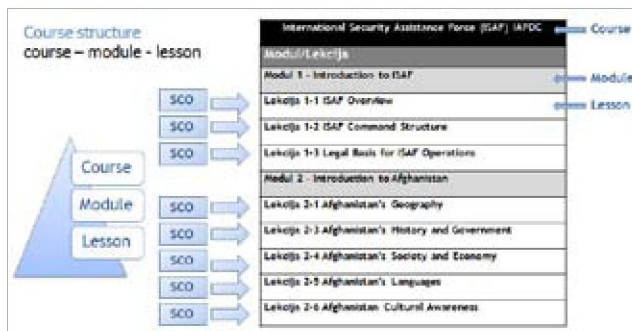


Figure 6. Course structure⁹

The planning process of an e-course should take into account the following seven key points: clear demands and requirements from the teacher or ordering party, availability of subject matter experts for professional guidance, course review by subject matter and management personnel, testing, identification of end users and course delivery, embedded reporting (feedback on success level) and assessment. From the subject matter expert perspective, the team designated for e-course design is only regarded as a means of achieving the objective.

Key points of development

- Clear demands and requirements from teacher
- SME availability
- Course review from SME and management staff
- Testing
- Identify target users and course delivery
- Feedback and evaluation



Figure 7. E-learning course development/cycle

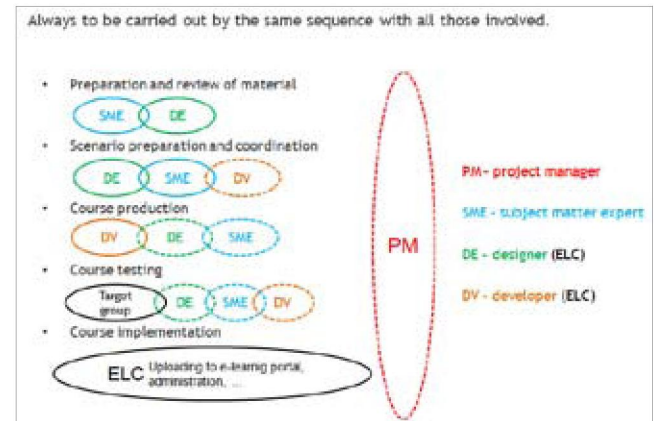


Figure 8. Course development with all involved

E-classroom

The CEI e-classroom enables autonomous login of users to e-classroom. The login right for e-classroom is granted only to two persons (e-classroom administrators). Upon logging in, users obtain access only to those subjects they have expressed their interest in and/or are available to all users within the SAF and MoD.

One of the requirements for user login is the user's MoD identification number (ID). Some of the subjects enable »guest« access. In this case, users have free access to subjects but their progress is not recorded by the system.

Military schools' students may be granted access only to subjects required by their curriculum and subjects available to all SAF and MoD personnel.

Users who are not employed in the SAF and MoD can also be granted access on the basis of a signed

⁹ <http://cei.mors.si/course/view.php?id=122>, downloaded: 10 November 2014.

cooperation agreement. Upon logging in to e-classroom they are subject to the same rights, rules and restrictions as those applicable for SAF and MoD users - access is only granted for specific subjects.

The results of work and use of EL in the SAF over the past three years have confirmed the good work and useful value of the introduction of the CEI e-classroom for the needs of the defence system and, lately, also in the wider public administration. In 2010, 224 new users logged in to the system, and up to October 2014, the CEI e-classroom had already recorded 5202 users¹⁰.

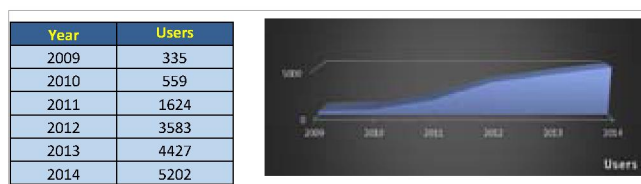


Figure 9. Analysis of user numbers¹¹

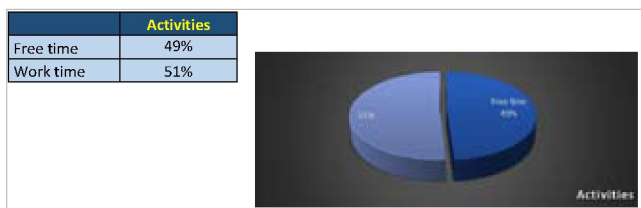


Figure 10. Activities in terms of time¹²

Data depicts e-classroom activities during work and free time of users.

Overview of users of e-classroom activities covering the years 2013 and 2014. Activities include publication, viewing and transfer of contents in e-classroom.

¹⁰ Given the 7217-strong active duty structure of the SAF, the number of members participating in the CEI system is indeed very big. (data as of September 2014). (<http://www.slovenskavojaska.si/o-slovenski-vojski>, downloaded: 7 November 2014).

¹¹ SAF E-classroom, Analysis of activities, October 2014. (<https://www.dropbox.com/home/CEI%20%281%29>, downloaded: 10 November 2014).

¹² Ibidem.

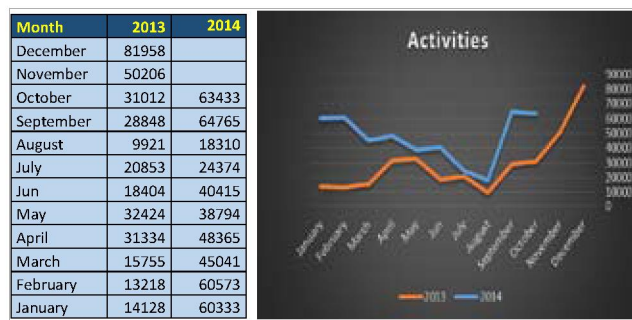
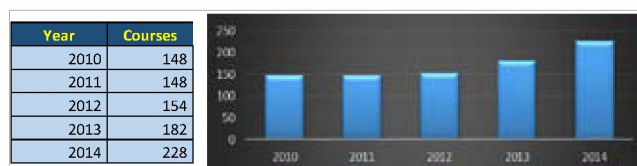


Figure 11. E-classroom activities¹³

Overview of course numbers¹⁴

Total number of courses in e-classroom available to users.



CONCLUSION / THE WAY AHEAD

The E-learning Department of the Military Schools Centre of the SAF ensures the use of distance learning programmes, design and development of individual courses, and training for subject matter experts in the use of application and implementation of individual e-courses, both within the defence system and beyond, for the purposes of the entire public administration. The Department cooperates actively with the Police and Police Academy, notably in the field of introducing combined education, the Ministry of Foreign Affairs in the area of introducing and designing e-content, the Slovene Intelligence and Security Agency in the field of training of e-education training, and the Employment Service of Slovenia, the Ministry of Justice and the Ministry of Finance in the field of designing e-courses. Discussions are currently underway on cooperation with the Ministry of the Interior and the Administration Academy.

Further development will focus mainly on the design of their own standardised military and non-military

¹³ Ibidem.

¹⁴ Ibidem.

e-learning contents and e-contents required by the entire public administration. An important shift was made in the field of IT support training to remedy inefficient use of available information solutions. This form of education will lead to a significant reduction of cost and the duration of individual forms of training.

The present and future EL success as part of military education in the SAF can be seen in the fact that teachers of individual education programmes are becoming increasingly engaged and, based on the needs and execution of ideas, create their own e-classrooms and encourage candidates and course participants to use them. This will undoubtedly result in higher education quality and destroy the myth of e-classroom as a library. EL will have to be identified as a mandatory supplement to conventional forms of VIU. Based on needs and experiences, the scope and content of future individual education processes will have to be identified for implementation in the form of EL. The discovery of the internet has changed everyday life and, consequently, the field of education. In the future, education will become a combination of classic and electronic forms of education. The division between both will not be clearly defined, and the anticipated change will definitely take time.¹⁵

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15 D. Ščavničar, *Possibilities of applying e-learning*, Slovenian Armed Forces (magazine), Ljubljana 2011, p. 30-31.

