



## Implementation of the Moodle Course Management System in English Language Training at the University of Defence

E. Staňková\* and H. Bušínová

*Language Training Centre, University of Defence, Brno, Czech Republic*

The manuscript was received on 31 May 2010 and was accepted after revision for publication on 14 September 2010.

### **Abstract:**

*The article examines the technological, methodological and systematic aspects of an e-Learning approach to English language training at the University of Defence, currently being implemented utilising the Moodle Course Management System. The article focuses on course content management in Moodle and its adaptation to the requirements of military education. The authors propose Moodle as an efficient and cost-effective technological solution for a virtual learning environment in the Armed Forces of the Czech Republic.*

### **Keywords:**

*ACR, Course Management System, e-Learning, English language training, Moodle, University of Defence*

### **1. Introduction**

Since the introduction of Information and Communication Technologies (ICT), the educational environment has experienced dramatic change. New technologies, in particular the Internet and computer mediated communication, enable educators and learners to access and retrieve study material with ease, and thus enrich classroom activities with up-to-date information. Moreover, the increased multimodality of material on the Internet, such as the use of words, sounds, still and moving images, allows learners to develop their own learning strategies with regard to their prevalent type of intelligence [1]. In addition, the interactivity of software applications, such as the use of hyperlinks, submitting written text, transferring spoken words and doing

---

\* Corresponding author: Language Training Centre, University of Defence, Kounicova 65, 662 10 Brno, Czech Republic, tel.: +420 973 442 389, fax number: +420 973 443 638, E-mail: [eva.stankova2@unob.cz](mailto:eva.stankova2@unob.cz)

exercises provided with automated feedback, activate learners' attention and encourage them to assume control of their learning. There is no doubt that the use of ICT enhances the quality and effectiveness of the teaching-learning process [2, 3, 4, 5]. Foreign language teaching in the military is no exception.

Most English language lecturers at the University of Defence (UoD) welcome the challenge brought about by computer assisted learning, hereinafter referred to as e-Learning. The search for new effective teaching-learning methods is a response to the requirement for Czech military professionals to enhance their English language skills in compliance with the demanding NATO STANAG 6001 standard [6]. By incorporating reasonable technologies into the teaching-learning process based on pedagogically sound practice, the lecturers expect military professionals to meet this challenging objective. However, it is very important to note that the UoD English language lecturers do not see e-Learning as a panacea for English language acquisition, and emphasize the importance of face-to-face instruction, particularly in developing conversational skills.

Based on the outcomes of research concerning the implementation of e-Learning in English language training at the UoD in 2005-2010, the authors suggest an efficient and cost effective e-Learning solution by employing the Moodle Course Management System (CMS). Although the first steps of the implementation of Moodle at the UoD are presented for English language training, the ideas and procedures are transferable into other specialized fields, and may inspire the teaching staff in the Czech military to enrich their instruction by using e-Learning tools.

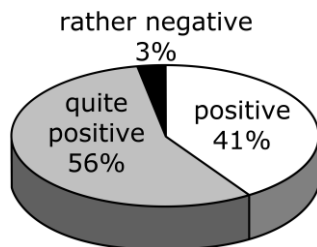
## **2. Looking for a Technological Platform for English Language e-Learning Support at the UoD**

In 2005, the English language lecturers teaching students at the Faculty of Military Technology (FMT) in cooperation with specialists from the Communication and Information Systems (CIS) Department started working on a project the aim of which was to build English language e-Learning support. This project was a welcomed opportunity to initiate interdisciplinary research, which has proven sustainable, and is ongoing.

The project resulted in English language e-Learning support that is accessible through the UoD Study Portal. It responds to the student language needs analysis, which had been carried out previously [7]. The e-Learning support contains more than 400 electronic theme-based objects arranged in eight sections. Many of the learning objects were created by lecturers using the ToolBook II Instructor authoring tool, which was purchased with an unlimited licence by the Military Academy (the predecessor of the UoD) in 2001. All of these learning objects are provided with interactive feedback, which allows the UoD students and staff to practise English language skills, grammar and military vocabulary any time from any computer, based on the principles of open learning [8]. When the project started in 2005, the UoD Study Portal was the most suitable virtual environment enabling lecturers to store their digital learning objects in a well-organised manner.

From 2006 the lecturers started incorporating e-Learning experiments into their classes. Subsequently, an opinion survey as part of student evaluation of the project was carried out [9]. 166 FMT UoD students in the Bachelor's and Master's study programmes participated in the survey. The results indicated that student acceptance of

e-Learning was very good. One of the significant aspects of student evaluation is presented in Fig. 1.



*Fig. 1 Student evaluation of the impact of e-Learning support on their English language skills development*

The pie chart shows that 97 per cent of respondents considered the impact of the e-Learning support to be positive. Apart from asking students for their evaluation, the survey aimed to elicit student suggestions on the improvement of e-Learning support. The predominant advice was to elaborate on feedback, namely to refine automatic correction of the language exercises. This legitimate claim was in line with the opinion of lecturers. Additionally, the lecturers noted a missed opportunity to monitor their students' work, to manage classes, and to record and evaluate their progress. It became obvious that the Study Portal had its limits. In response, the authors sought a new technological solution for course management, which would satisfy the requirements of both students and lecturers. Stemming from their own experience from several distance learning courses, they had an opportunity to compare and assess various Course Management Systems, such as Barborka, Eden, Ilias and Moodle, from the perspective of both the learner and educator.

Coincidentally, the search for a suitable virtual learning environment for the Czech military was also an objective of the DISTANCE Defence Research Project in 2007-2008 [10], in which one of the co-authors participated. Within this project, three independent studies suggested Moodle as a suitable CMS for the Armed Forces of the Czech Republic (ACR). At the same time, Moodle was being adapted at the CIS Department and prepared for use by the UoD [11].

The following chapters introduce the benefits of Moodle, largely from the perspective of the course manager and tutor.

### 3. Moodle CMS

Moodle is free software with an open source code. It can run in Unix, Linux, Windows, Mac OS X, Netware and in other systems with PHP (Hypertext Preprocessor) support. The word Moodle is an acronym for Modular Object-Oriented Dynamic Learning Environment. Moodle allows educators to integrate content in a wide range of different formats, including SCORM, Flash, MP3s and RSS feeds. More technical details can be found on the Moodle Demonstration Site [12], in specialist articles [13, 14] and various studies [2, 10].

The global popularity of Moodle is shown by the graph in Fig. 2, which was adapted from the Moodle Demonstration Site [12]. In the Czech Republic, for example, there are currently about 400 registered Moodle sites.

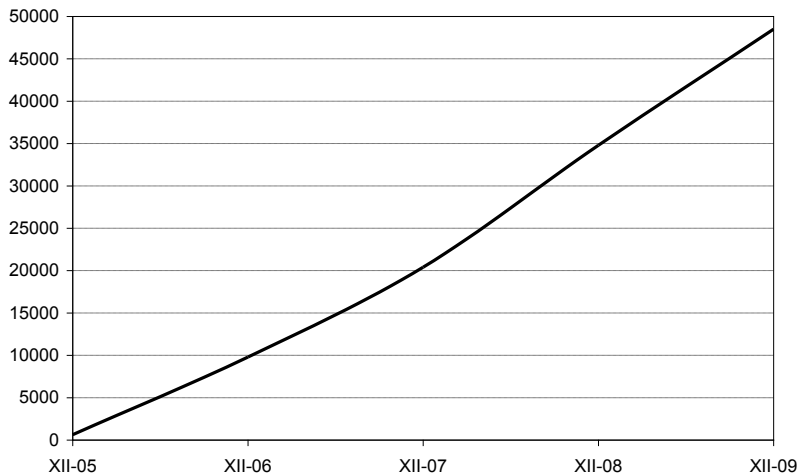


Fig. 2 Growth of known Moodle sites in the world in 2005 -2009 [12]

The following three sub-chapters deal with basic Moodle educational tools designed for communication, course content creation and study activities development.

### 3.1. Communication Tools

Out-of-class communication is supported by the following Moodle communication tools.

- *Forum*: which works as a classic school message board – all participants of a course can post their messages and track responses. Thus it may serve useful discussions. It is asynchronous and as a result participants in Forum discussions are not pressed by time to answer quickly; on the contrary, they can consider their replies carefully. It fosters the social part of the course. People who are shy when communicating face-to-face may appreciate it. Each forum is course specific.
- *Chat*: contrary to Forum, this is a synchronous activity which is generally very popular among young people. To begin chatting, it is necessary to create a chat room and then decide on the frequency and times of a particular chat. Chat is course specific.
- *Messaging*: provides for private communication between a tutor and one or two students. It is not course specific, so all participants of the courses within one Moodle site can communicate together.

### 3.2. Course Content Creation

Moodle enables tutors to upload study materials in a wide variety of formats.

- For presenting content it is possible either to compose a text page or a web page, or to provide a link to an uploaded file or web site.
- Sound files, pictures, video files and animations can be used in the same way.
- Recommendation for study materials formatting: texts in .pdf format, .mp3 audio files and very short videos in .flv format.

- The size of files for uploading materials is limited to 16 MB.
- Learning objects are easily updatable.

### 3.3. Activities Development

Moodle provides educators with web-based tools for a large spectrum of educational activities, such as assignments, quizzes, blogs, databases and Wiki. The following paragraphs present two examples of them.

Assignments enable tutors to state their requirements on students. They can set homework and deadlines. As soon as students upload their homework, the tutor can retrieve it, evaluate it and comment on it.

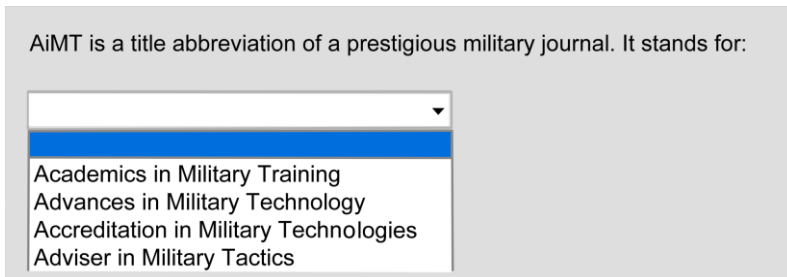
Quizzes are containers for questions with exact rules for interacting with them. Test questions can take many forms, such as:

- multiple choice questions;
- true or false questions;
- short answer questions;
- matching questions;
- gapped text.

They are quite easy to program. The advantages are enormous:

- time options for performing the tasks are clearly stated;
- time limits for solving questions can be given;
- time delay between individual attempts (if allowed) can be set;
- questions may be shuffled to prevent students from cheating in the computer lab, so that each student has a different quiz layout.

An example of a multiple choice item, as displayed to students in a test in Moodle, is shown in Fig. 3. Students have to select the best possible option out of the choices on the list.



*Fig. 3 Multiple choice item as displayed to students*

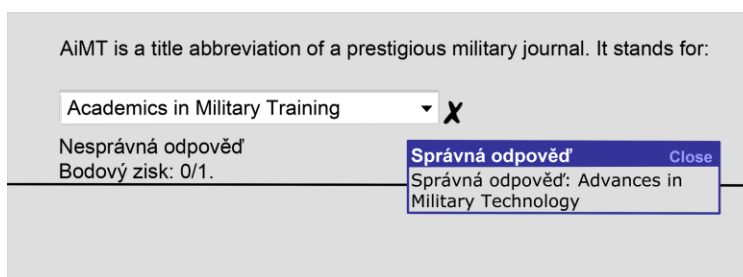
To program such a quiz item, it is necessary to use GIFT symbols. The item shown in Fig. 3 is programmed as presented below. The format symbols used are explained in Table 1.

```
AiMT is a title abbreviation of a prestigious military journal. It stands for:  
{1:MULTICHOICE: Academics in Military Training #~= Advances in Military  
Technology #~ Accreditation in Military Technologies #~ Adviser in Military Tactics  
#}
```

*Tab. 1 GIFT symbols used for programming*

GIFT symbol	Meaning
{	start answer(s)
}	end answer(s)
{ ... =right ... }	correct answer
{ ... ~wrong ... }	incorrect answer
#feedback text	feedback for the answer

After answering the question and submitting the test, the student gets feedback. In case of an incorrect answer the student will receive the feedback shown in Fig. 4.



*Fig. 4 Feedback*

The main merit of the quizzes in Moodle lies in automatic correction, grading and feedback. The tutor decides whether the students can see their responses together with their scores, the correct answers and general feedback. As shown above, testing in Moodle is easy, user-friendly, time effective and objective.

#### **4. Using the Moodle CMS in English Language Training at the UoD**

Due to the care and support of administrators at the CIS Department in 2009, the authors started developing their first English language courses in Moodle and some of their colleagues followed suit. At the moment, the English language lecturers and their students are by far the most frequent users of the UoD Moodle CMS.

##### **4.1. Course Management**

The first steps in using Moodle were driven by the need to provide UoD students and lecturers with easy access to study materials. It was a reaction to the innovative topic-based syllabus designed for preparing military students for the demanding foreign language requirements set by the Ministry of Defence. Since the topics selected for preparing for the NATO STANAG 6001 examination, Standardized Level of Proficiency 3 [6], mainly reflect current issues, it is quite obvious that the teaching material has to be easily updatable. Moodle offers appropriate tools for creating such course content.

To meet the curriculum objectives, five courses serving as a bank of teaching materials have been under development; three of them are topic-based, one of them is focused on English language skills improvement, and the last one contains tests. The

learning objects are mostly in the forms of authentic texts, texts adapted for teaching purposes, interactive exercises in ToolBook II Instructor program (see Fig. 5), audio and video files and hyperlinks to relevant web sites. UoD students can contribute to the bank by adding materials of their own interest. Thus the learning support becomes tailored to their needs. The learning objects stored in the bank can be exported into other courses.

Fig. 5 shows an example of an e-Learning object created by one of the co-authors in collaboration with a UoD student – a future combat engineer. The student selected the topic according to his interest, searched the Internet for an authentic text and prepared a set of vocabulary exercises. The purpose of this learning object is to practise specialised vocabulary in context by dragging and dropping words. This learning object was programmed in ToolBook II Instructor software. In the heading of the screenshot, there are metadata characterizing the learning object:

- A – identification of the author that can be triggered by a mouse hover;
- 2 – recommended level of English language proficiency [6];
- Specialist reading – the section in the course where the object is stored;
- Combat Engineering – the theme of the learning object.

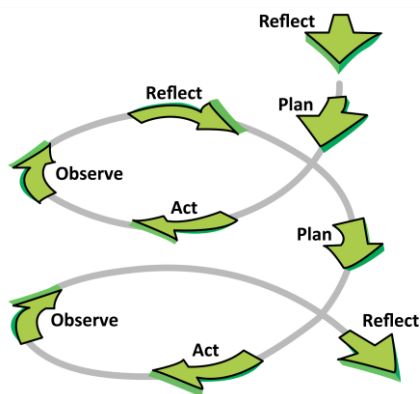
The feedback is provided in the form of scoring, as indicated by the score next to the Your score button at the bottom.

The screenshot shows an e-Learning interface with a green background. At the top, there is a header with a triangle icon containing the number '2', the text 'MILITARY Reading', and the title 'Combat Engineering' in a large, bold, green font. Below the header, a black box contains the instruction 'Complete the text using the following nouns:'. Three dark green boxes with white text contain the words 'fortification', 'conditions', and 'combat'. The main text area contains two paragraphs with several blank boxes for word insertion. The first paragraph reads: 'Combat engineering is the practice of using the knowledge, tools and techniques of engineering in [ ] . A combat engineer, in many armies also called a pioneer or sapper, is a military specialist in using the tools and techniques of engineering under combat [ ] , who may perform any of a variety of tasks.' The second paragraph reads: 'Such tasks typically include [ ] , bridge and road construction or destruction, laying or clearing [landmines] , as well as general engineering tasks under fire. More generally speaking , the combat engineer/s tasks involve facilitating movement and support of friendly forces while impeding that of the enemy.' The third paragraph reads: 'Usually, a combat engineer is also trained as an infantry rifleman for [self-defence]'. On the right side of the text area is a photograph of a soldier in full combat gear using a metal detector in a desert environment. At the bottom of the interface, there is a 'Reset' button, a 'Your score' button showing 'Score: 2 out of 5', and a set of four navigation arrows (left, left, right, right).

Fig. 5 Screenshot of an e-Learning object created by Igor Balogh and Eva Stankova

An example of the systematic use of ToolBook II Instructor software is the CD ROM Interactive Military English Exercises created by two members of the UoD Language Training Centre, also one of the co-authors of this article [15].

In terms of methods applied in the e-Learning objects development, the method of action research has been used. There are several definitions of action research, and most of them describe it as a spiral of steps, each of which is composed of a circle of reflecting, planning, acting, observing and reflecting again, as shown in Fig. 6. This method facilitates systematic improvement of learning objects, engaging both the educators and learners in collaborative research [9, 16-18].



*Fig. 6 Steps of action research*

Although this method was introduced as early as 1946 by Lewin [19] it still plays a growing role in the field of education because of its promise for improving educators' practice, strengthening the connection between research and practice, and providing full participation of the research process by those who are affected by it.

#### **4.2. Class Management**

Apart from building the teaching material bank, the English language lecturers create time-based courses for the needs of individual language classes [20]. For each class, password limited access for the course tutor and students can be established.

The courses:

- are designed to follow the school-year timetable in a weekly format; one week Moodle section supports 2 to 4 lessons of face-to-face classes;
- are designed as a bank of study materials and variety of study activities;
- enable automatic evaluation and grading of the students' performance;
- provide the students with feedback immediately after submitting the completed task or quiz;
- provide the tutors with the students' scores throughout the whole course;
- enable the tutors to track the activity of students during the course through detailed logs and participation reports;
- give the tutors feedback on study materials and activities.

These courses serve the needs of non-homogeneous classes. The students can work independently, at their own pace, according to their capabilities. The courses support students at a lower level of proficiency in English with extra exercises. At the same time, students with a higher level of proficiency may work on more demanding activities. For students who have missed some face-to-face instruction, using Moodle ensures easy access to all materials covered in classes. Similarly, communication



through Messaging proves convenient and useful in cases of students absent from classes – the students can send their apologies to the tutor and the tutor can send them specific instructions.

The experience of the authors with the weekly format courses over one academic year demonstrated that:

- students usually access Moodle when there is a deadline for a homework task or when they want to prepare for a progress test;
- first-year students adapt to working with Moodle more easily than the second- or third-year students (for whom using Moodle constitutes a change in their study habits);
- students generally welcome the opportunity to work with Moodle – they particularly appreciate audio and video files;
- they tend not to print study materials, more often they rely on the fact that the study materials are always accessible through Moodle;
- the students’ performance, study effort and attitude to learning English in face-to-face lessons corresponds to their performance in Moodle.

Moodle provides tutors with participation reports, keeping them informed about the students’ and tutor’s activity in the system. Once a participant logs in Moodle, this access becomes a part of statistics. Fig. 7 is based on a graph automatically generated by Moodle. It shows access statistics of twelve second-year students (one language class) of the Bachelor’s study programme and the English course tutor within a period of four months (arranged by weeks from January 25<sup>th</sup> 2010 to May 17<sup>th</sup> 2010).

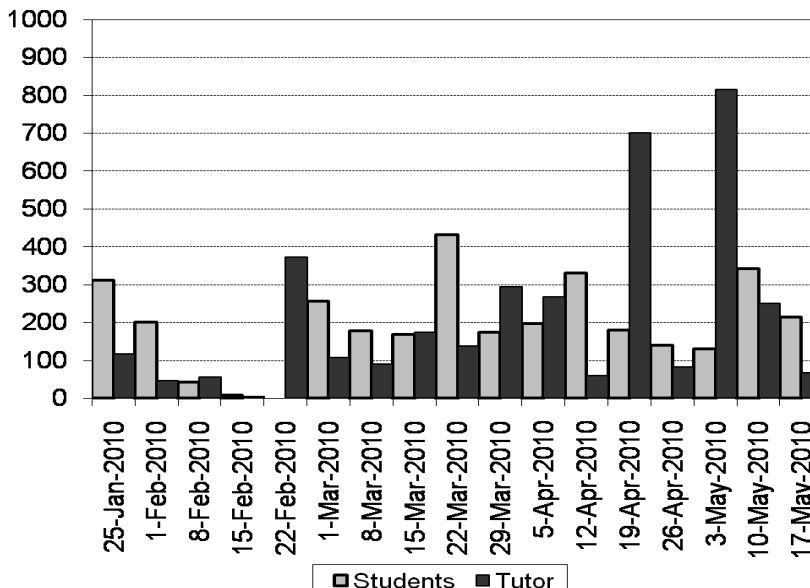


Fig. 7 Utilisation of the UoD Moodle CMS by twelve students and their tutor within a period of four months

The graph shows how student participation varies over the academic year. There is a drop in student access in the second and third week in February 2010 after they fulfilled the requirements set for the winter semester. Throughout the summer semester, their input increases, especially in relation to the deadlines for the submission of written assignments, or announced progress test dates. The graph also shows the participation of the tutor, reflecting the time needed to insert new materials into the system, to correct and evaluate written assignments, and monitor the performance of the students in all the tutor's courses. At that time, the tutor (the co-author of this paper) conducted four courses and was uploading study materials to three more courses. The peak values in the tutor's participation mirror her enthusiasm and effort to master the course management in Moodle.

## 5. Instructional System Design and Project Management Process

Implementation of any educational project requires the adoption of a suitable Instructional System Design (ISD) [21]. There have been dozens of ISD models proposed for conducting educational projects, but almost all of them are based on the generic ADDIE model. The acronym stands for the individual steps of the project: Analysis, Design, Development, Implementation and Evaluation. Each step has an outcome that feeds the subsequent step. This approach provides a step-by-step guidance for the assessment of students' needs, the design and development of training materials, and the evaluation of the effectiveness of the training intervention. Even if the ADDIE model has been criticized by some as being too linear and inflexible, it offers simple practical guidance that, if thoughtfully followed, provides developers with a systematic approach.

Based on the experience of conducting several e-Learning projects at the UoD, the authors elaborated on the ADDIE model and applied it to the implementation of e-Learning. The following steps suggest a general project management procedure suitable for e-Learning projects implementation at educational institutions.

- Carrying out a needs assessment of students and lecturers.
- Setting objectives and target groups.
- Designing the project.
- Gaining institutional support.
- Budgeting.
- Providing the necessary equipment and technology.
- Creating a team, dividing roles (manager, content author, tutor, system administrator and technician).
- Identifying potential collaborators from other institutions. Making contracts.
- Training team members to use the given technology.
- Designing and creating courses.
- Piloting, gaining feedback, evaluating and improving the courses.
- Implementing the courses, gaining feedback, updating courses.
- Continuous upgrade and service of technology.
- Continuous training of team members.
- Sharing experience and publishing project results.

The aim of the suggested project management procedure is to provide prospective facilitators of e-Learning projects with guidelines which could help them foresee the feasibility of their intended projects.

## 6. Conclusion

The article introduces the Moodle Course Management System as one of the possible technological solutions for a virtual learning environment in the ACR. Moodle has features that allow it to scale to very large deployments and hundreds of thousands of students. Moodle modules enable the educators to build richly collaborative communities, to deliver content to students, and assess student performance. The main advantage of Moodle lies in its user friendly interface, ease of use and mastery, minimal support requirements, collaboration with the open source community, flexibility, and adaptability to the needs of educators and learners. Using Moodle as a material bank also contributes to saving printers, ink, paper and money.

The potential of Moodle has been examined in English language training at the University of Defence. The authors have created several user-friendly courses, which are designed to augment face-to-face instruction. In terms of the methods facilitating the learning objects development, the method of action research has been suggested as an effective way of constant improvement of the developers' practice, connecting research and practice, and allowing students and lecturers to participate in the research process.

Based on the experience of conducting several e-Learning projects at the UoD, the authors elaborated on the ADDIE model and outline a project management procedure, which should assist prospective facilitators to manage e-Learning projects.

## References

- [1] GARDNER, HE. *Multiple Intelligences: New Horizons in Theory and Practice*. New York : Basic Books, 2006. 320 p. ISBN 0-465-04768-8.
- [2] BIELAWSKI, L. and METCALF, D. *Blended eLearning*. Massachusetts : HRD Press, 2005. 326 p. ISBN 0-87425-860-X.
- [3] JOCHEMS, W., MERRIENBOER, J. and KOPER, R. *Integrated E-Learning*. London and New York : RoutledgeFalmer, 2004. 212 p. ISBN 0-415-33502-7.
- [4] WARSCHAUER, M. and KERN, R. *Network-based Language Teaching: Concepts and Practice*. Cambridge : Cambridge University Press, 2000. 240 p. ISBN 0-521-66742-9.
- [5] WHITE, C. *Language Learning in Distance Education*. Cambridge : Cambridge University Press, 2003. 280 p. ISBN 0-521-89455-7.
- [6] *STANAG 6001, Edition 3*. [on line] [cited 2010-05-20]. Available from : <<http://www.bilc.forces.gc.ca>>.
- [7] BUCHTOVÁ, H. and STAŇKOVÁ, E. Language Training from the Perspective of Military University Students (in Czech). *Vojenské rozhledy*, 2005, vol. 14, no. 1, p. 112-116, ISSN 1210-3292.
- [8] GALL, MD., GALL, JP. and BORG, WR. *Educational Research*. Boston : Pearson Education, 2007. 672 p. ISBN 0-205-50345-4.
- [9] STAŇKOVÁ, E. Bridging Distance and Face-to-Face English Language Training in the Armed Forces of the Czech Republic. In *CATE Conference Proceedings /CD-ROM/*. Brno : University of Defence, 2007, 8 p. ISBN 978-80-7231-240-5.
- [10] HALBERŠTÁT, L., and PŘENOSIL, V. et al. *DISTANCE Defence Research Project - Final Report* (in Czech). Prague : MoD, 2009.

- 
- [11] *University of Defence – LMS Moodle*. [on line]. [cited 2010-05/28] Available from: <<http://moodle.unob.cz>>.
- [12] *Moodle* [on line]. [cited 2010-05/23] Available from: <<http://moodle.org/>>.
- [13] COLE, J. and FOSTER, H. *Using Moodle, Teaching with the Popular Open Source Course Management System*, 2007. 266 p. [on line] [cited 2010-05-22]. Available from: <[http://download.moodle.org/download.php/docs/en/using\\_moodle\\_2e.zip](http://download.moodle.org/download.php/docs/en/using_moodle_2e.zip)>.
- [14] FRANC, V. Usage of Moodle and adobe flash for architecture and hardware design. In *Distance Learning, Simulation and Communication Conference Proceeding*. Brno : University of Defence, 2009, p. 35-37. ISBN 978-80-7231-638-0.
- [15] BUŠINOVÁ, H. and STODOLOVÁ, J. *Interactive Military English Exercises. /CD-ROM/*. Brno : University of Defence, 2007. ISBN 978-80-7231-290-0.
- [16] STAŇKOVÁ, E. Multimedia approach to language teaching: learners produce sustainable teaching content. In *Information and Communication Technology in Education Conference Proceedings*. Ostrava : University of Ostrava, Faculty of Science, 2008, p. 103-106. ISBN 978-80-7368-577-5.
- [17] STAŇKOVÁ, E. Tailoring English Language e-Learning Objects to Students' Needs. In *Distance Learning, Simulation and Communication Conference Proceedings*. Brno : University of Defence, 2009, p. 165-168. ISBN 978-80-7231-638-0.
- [18] STAŇKOVÁ, E. and SLAVÍKOVÁ, J. By InteraCTion with ICT to ELaboraTion of ELT. In *Language for Specific Purposes in Higher Education*. Brno : Technical University and University of Defence, 2006, p. 344-351. ISBN 80-214-3213-6.
- [19] LEWIN, K. Action research and minority problems. *J. Soc. Issues*, 1946, vol. 2, no. 4, p. 34-46. ISSN: 0022-4537.
- [20] BUŠINOVÁ, H. Electronic lesson plan and LMS Moodle in face-to-face English lessons (in Czech). In *Alternative Methods Conference Proceedings /CD-ROM/*. Prague : Charles University, 2010. ISBN 978-80-7435-043-6.
- [21] HODELL, CH. *ISD from the ground up: a no-nonsense approach to instructional design*. Alexandria, VA : ASTD Press, 2006. 200 p. ISBN 1-562-86455-6.

### **Acknowledgement**

The article presents the outcomes of the ongoing Specific Research Project carried out at the Language Training Centre, University of Defence, in 2010. The authors would like to thank Mgr. Robert Brukner for revision and language support in the preparation of this article.