E-LEARNING AS WINNING TOOL FOR SUPPORTING TEACHING AND FOR ENHANCING THE INTERNATIONALIZATION PROCESSES

Enrico Spinello, Gianluca Torbidone
The IT-Army Education and Training Command and School of Military Applied Studies, Via dell'Arsenale 22, Turin, Italy
enrico.spinello@esercito.difesa.it, gianluca.torbidone@esercito.difesa.it

Marina Marchisio°, Sergio Rabellino*
*°Department of Mathematics, Via Carlo Alberto 10, *Computer Science Department, Corso Svizzera 185,
University of Turin, Turin, Italy*
marina.marchisio@unito.it, sergio.rabellino@unito.it

Abstract: In order to improve education and to develop a stronger internationalization program, the Education and Training Command and School of Military Applied Studies of Turin and the University of Turin adopted a virtual learning environment as main tool within the Bachelor and Master Degree in Strategic Sciences for Military and Civilian students. A great number of modules of different subjects are available on a dedicated E-learning platform (MOODLE) where students receive additional contents, discuss with peers and are supported by teachers. Through interactive materials and different activities they can develop the capability of discerning, combining and applying the knowledge. These skills are very useful in the professional environment especially for a military officer and for civilians who are supposed to work in similar complex contexts. Thanks to this E-learning system education, programs such as the Military Erasmus, where military and civilian students of several European education institutions are involved are facilitated. Selected students share experiences, attend blended courses and finally can grow up with a common European feeling. In order to adopt this E-education the Education and Training Command and School of Military Applied Studies of Turin and the University of Turin invest time and effort into the training of teachers, developing new interactive materials and offers a custom helpdesk for a prompt and personalized support. This way of providing education is considered the best way for the future, because it prepares students for global changes and offers real opportunities of lifelong learning. Students' feedback is extremely positive and this encourages to continue with this kind of e-learning activities.

Keywords: E-learning; Military Training; Virtual Learning Environment; Internationalization.

I. INTRODUCTION

Since 1998 the IT-Army Education and Training Command and School of Military Applied Studies (COMFOR) in Turin and the University of Turin (UniTO) have developed a Bachelor Degree and a Master Degree in Strategic Sciences for Military Young Officers and Civilian Students in order to prepare professionals able to operate and take part in operations and missions in national and international complex context.

The COMFOR is responsible for providing education and training for all Italian Army Officers with the exception of Medical and Veterinary Services. Part of the education program is realized in strong coordination with the dependent Military Academy, which is located in the city of Modena and deals more with the initial basic training for young citizens who join the Army and with their transformation in soldiers and officers. The regular course for being an officer in Italy is based on a 5 year cycle system and linked to a university program. Military students spend two years in the Academy as cadets and after being commissioned Officers they move to Turin in order to complete their preparation and to obtain the Bachelor Degree and a Master Degree in Strategic Sciences. The Institute is also in charge of providing education and training for Direct Entry Officers, Reserve Officers and Special Reserve Officers with different courses based on different levels of preparation and in accordance with specific and peculiar requirements. It also organizes, in a lifelong learning

perspective, the Army Staff Course, the Battalion Commanders Course and the Qualification of military teachers.

The University of Turin is one of the biggest State Universities in Italy, with about 70.000 students; among the long list of available Bachelor and Master degrees UniTO students can attend this very peculiar course: Strategic Sciences.

The total number of students for this specific training process is about 360 military officers (the last three years) and 200 civilians (the Bachelor Degree is opened to a limited number of students: 40 selected people per year).

The education system for Strategic Sciences is based on a multidisciplinary concept with a wide range of disciplines where theory is supplemented by an intensive program of practical activities, vocational disciplines and traineeships. Simulation and use of virtual operational scenario with exercise on the field (external activities) are fully integrated in the curriculum.

In order to be adapted to the military requirements in accordance with different branches and specialities, 5 different curricula of the Bachelor and Master degrees were developed:
- political sciences/management for Infantry, Cavalry and Artillery;
- infrastructural system for Combat Engineering;
- communication for Signal Corps;
- logistics;
- economics.

An additional international curriculum, based on the European International Semester developed within the European Initiative for the exchange of young officers, inspired by ERASMUS, led by the Executive Academic Board Implementation Group (EAB-IG) under the aegis of the European External Action Service (EEAS), was configured and could be implemented in the next future in accordance of possible international cooperation and partnership.

This variety in academic and vocational disciplines permits to grant a specific and highly qualified preparation for future functions and possible tasks that each graduated student could do in his/her life for public or private companies. At the moment, the curricula developed for civilian students are political sciences/management, logistics and economics.

The education and training system is not limited to the Bachelor and Master degree level but it is continuous and permanent in a lifelong learning perspective also because Officers are located in different places and sometimes they serve in missions and operations in Italy or abroad.

For all these reasons and in order to meet specific needs of teachers who come from different study areas with different requirements, a Virtual Learning Environment (VLE) was adopted as a winning tool.

II. THE E-LEARNING FOR TRAINING OF THE ITALIAN ARMED FORCES: THE STATE OF ART

Since the beginning of 2000 the Italian Armed Forces started to experiment new solutions for training purposes and the e-learning system offered a new opportunity for innovative methodologies [1]. The reasons of this interest could be found in the opportunity offered by technology in order to prepare and update military personnel in an efficient way, reducing costs of management and facing at the same time the budget cutting.

The Navy and Air Force decided to implement new e-learning projects by focusing their interest to an Open Source environment. The MOODLE platform was adopted as final solution and it was inserted in a distance learning and cooperative e-learning program, the DIONE projects for the Navy and the pilot project called AGP for the Air Force. The Guardia di Finanza (a financial military police) implemented in 2008 a distance learning concept by using several courses based on MOODLE platform with success.

The Army also invested resources in e-learning in order to develop a specific distance learning system. In particular in 2013 the COMFOR started to cooperate with the University of Turin in this area of interest and since then the e-learning has been developed and implemented with great and effective results [2].

The new concept of e-learning [3] based on the use of multimedia technologies combined with the possibility of an internet access, is now a multiplier tool able to ease the access to resources and

services. It has created new opportunities for remote exchanges and distance cooperation and radically changed the way of teaching and learning. This opened new and challenging scenarios and every institute who normally deals with teaching and learning cannot avoid comparing and match with. There are evidences that the participation to online collaborative activities and discussions promotes critical thinking [4], [5].

In addition to the reasons mentioned above the implementation of any internationalization programmes is not possible without the use of an e-learning platform [6].

In November 2008, the European Union Ministers of Defence adopted the European Initiative, which is intended to strengthen the interoperability of the armed forces of the EU Member States and promotes a European security and defence culture through an enhancement of the exchange of young officers during the initial phase of their officer training. In order to realize it, a group of experts was created, EAB-IG, who defined 8 lines of development, two of them dedicated to new technologies: the development of Internet-Distance Learning (IDL) and the creation of a dedicated IT platform.

III. THE STRATEGIC SCIENCES VIRTUAL LEARNING ENVIRONMENT

As a logical consequence, a virtual learning environment has been created for satisfying all the needs of military and civilian education system after the realization of Wi-Fi coverage of two main didactic areas within the military campus. The VLE, based on a MOODLE software, promotes two different main actions: the enhancing of the quality of learning and the internationalization programme.

3.1 The MOODLE platform

The MOODLE platform was designed and implemented by the COMFOR and UniTO together in a strong cooperation perspective in the year 2015. In order to meet and integrate several different requirements, military and academic, two separated and independent platforms were created but fully integrated and linked. Officers as attendees are both military and university students and for this reason they need to have access to both of them. The platforms were designed in a way that allows students (military and civilians) to have a regular access to their respective web-page and then surf both with a controlled and regulated access system.
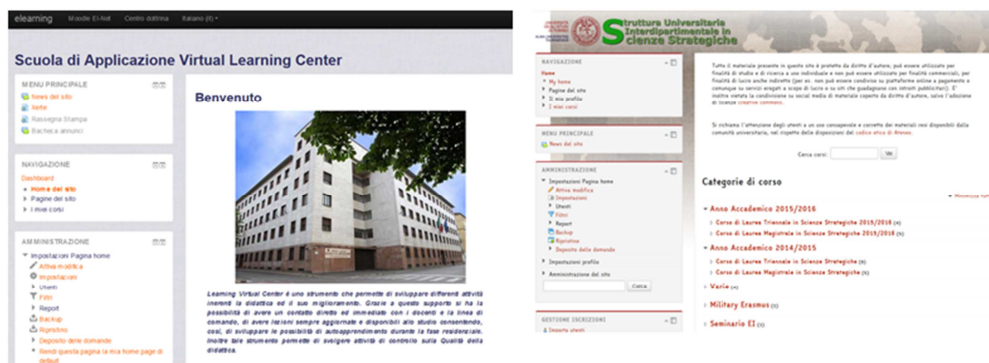
Figure 1. The two Moodle platforms and the web addresses.

The platform was enriched with several additional tools such as an Automatic Assessment System (ASS), an Advanced Computing Environment (ACE) particularly useful for learning scientific disciplines, and a web-conference system.

It has been organized and structured in order to host a lot of different disciplines and subjects for different kinds of courses and attendees.

In order to manage it properly, a complex management system has been developed that deals with the accreditation system for students and teachers. A service is available that trains and supports the teachers until they are able to manage their courses alone. Every year there is a quite consistent

change of teachers so the training services can provide lessons for newcomers as well as for experts who want to improve their qualification and competence in e-learning. Naturally, due to the great numbers of clients, a continuous help-desk service is provided.

The following figures show the modular structure of the discipline Mathematical Models as an example. Every module contains theory, interactive files where students can find applications of the theory to work on and try to apply directly knowledge and develop abilities and competences. Every student can test himself immediately with an automatic testing system which allows the student to reflect on errors and mistakes.
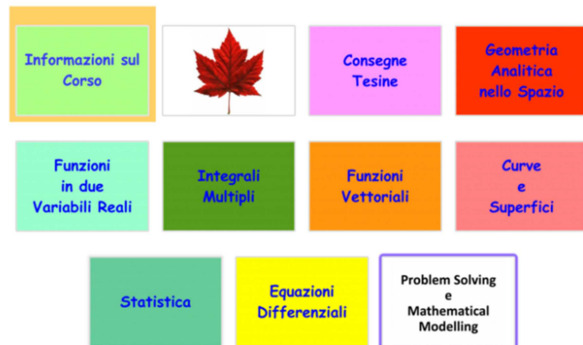
Figure 2. The modular structure of the Mathematical Models Course.   Figure 3. The organization of a module

3.2 The VLE action for enhancing the quality of learning

Nowadays the distance learning assumes a great importance and becomes mandatory for innovative institutes. The VLE in Strategic Science was not created to satisfy this request because the lessons are provided in presence, but also to give a real and effective support for teachers and learners. All courses are delivered as MOOC and they are built following the "Knowledge Building" inspired by Bereiter and Scardamalia [7]. Students are not only required to learn, even passively, but also to build their own knowledge in a social and collaborative environment and in this way they become useful for the entire community they belong to: the "Knowledge building community". The entire course becomes virtual and students are involved in producing useful ideas for the community. Teachers in this social world become the experts and are involved in this knowledge building process, steering students and creating examples; usually teachers are experienced and have to manage the common research in which the community will be involved. Learners do not have to learn by memorizing data and concepts, but their learning process will be progressively refined and the knowledge building process will be connected more and more to themes and problems related to the final goals. Therefore the learning process for the student is an improvement of knowledge and the knowledge building process becomes a general improvement for the community.

The system can also be used by teachers who are not very experienced in e-learning, it allows to do a lot of work in a new and effective way, such as monitoring students' learning process during the course and consequently tailoring the regular lessons, and selecting the best evaluation tool like working group, peer evaluation, individual test, paper production, etc.

As learners for example of the Mathematical Models Course you can:
- read and be prepared on the contents of the lessons because the teacher uploads the presentation and materials related to the lesson in advance;
- receive additional contents on the same topics;
- discuss with peers and be supported easily and promptly by teachers;
- receive feedback on your preparation by using the auto assessment system;
- use interactive materials and different activities;
- increase your skills by developing capability of discerning, combining and applying the knowledge.

The platform gives the opportunity to create a social community, based on the same interests where groups of people start to know each other, to build the team and work together while practising the cooperative learning. A very interesting example of creation of community is the specific group of learners belonging to the Selected Reserve Course, professionals who decided to join the army for a

period of time, which can create a virtual community before the starting of the residential phase thanks to MOODLE platform. This influences them in a positive way because, through the virtual community, they drastically reduce the stress that comes from joining a different reality and attending an intensive short course.

3.3 VLE as tool for enhancing the internationalization programme

Today the learning process cannot remain at national or local level but has to be compared with other experiences in other countries in order to improve and share best practices. For those institutes who want to have an international orientation and a strong European spirit it is necessary to adopt courses where part of the program contains common modules or disciplines and where the mobility for students, teachers and staff is considered as a regular procedure. In this perspective the VLE in Strategic Sciences can act at different levels.

Within the European Initiative, the so called Military Erasmus, every year some institutes organize and offer to other EU Member States some modules in English developed on important common topics. The IT-Army Education and Training Command offered since 2013 two common modules per year. The topics are the Common Security and Defence Policy (CSDP) and Law of Armed Conflict (LOAC). These modules are opened to civilian students and to other EU Member States. They consist of a distance learning phase and a residential phase. The residential phase is one week with regular lessons with teachers, researchers and military experts, accompanied by interactive activities such as team work and open discussions. The distance learning phase is in support for the residential one and responsible for creating a common ground for a heterogeneous group because we host students with a very different university background and coming from a different cultural environment. The distance learning phase reduces the length of the residential phase and consequently the costs and permits to have a minimum level of knowledge on the chosen topic that is considered a sort of prerequisite. The use of the platform during the distance learning phase is also an opportunity to create a common feeling about the course especially for those students coming from abroad. By using the platform it is also possible to deliver information regarding the course instead of sending a lot of e-mails.

By using e-learning tools it is possible to build in cooperation common courses (lessons, e-books, presentations and materials) and to share them in distance learning courses among European institutes with the same interests. Parts of these programs are organized under the Erasmus + budget so they are immediately available (e.g. the entire European International Semester created as KA2 Strategic Partnership and developed by Military Academy of Land Forces in Wroclaw (POLAND) in cooperation with other four European partners will be available in the next future).

The use of e-learning to support teachers and students is useful also for other situations: it allows Erasmus students to keep in contact with the sending institute and be ready after the study abroad period to continue the regular university career especially for those exams considered fundamental or mandatory, for people who could not attend the regular lessons and for those who are involved in practical training.

Inside a VLE students also learn the importance of following the rules and deadlines and get used to obeying and meeting the deadlines by submitting replies and papers on time. The intensive use of e-learning platform, such as the use of internet meetings (synchronous or asynchronous), reduces the costs of students' presence (in case of online courses this is particularly evident but it is possible for blended courses) and also enables the teacher to keep a constant overview on the course in case of involvement in outside meetings or research.

IV.   RESULTS AND DISCUSSION

The following figures shows the total number of accesses to the platforms in the last five months from the beginning of a.y. in September 2016. The military platform is called SCAPPLI (figure 4) while the university platform is called SUISS (figure 5). They show clearly two different and particular moments of the academic year: the initial part in September and the period dedicated to the exams in December.
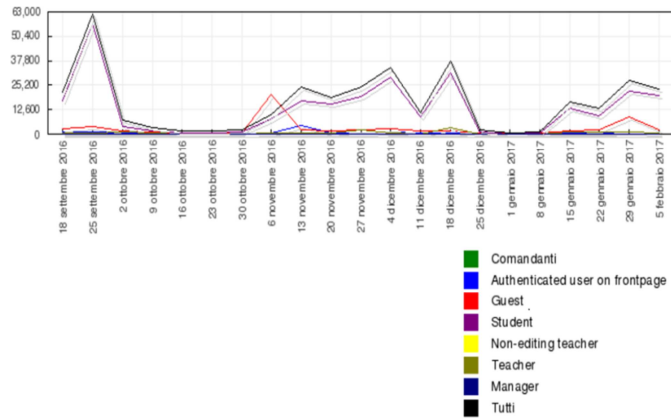
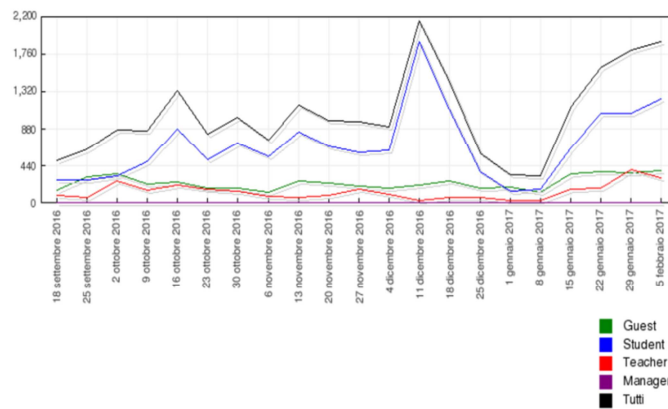Figure 4. The number of logs of Scappli Platform.

Figure 5. The number of logs of SUISS Platform.

The following figures show feedback obtained from students who took part in courses composed of a distance learning and a residential phase. Such as the CSDP Common Module (Figure 6) for young officers, the Stabilization and Reconstruction Management Course (Figure 6) dedicated to Generals and Colonels and to equivalent civilian positions.
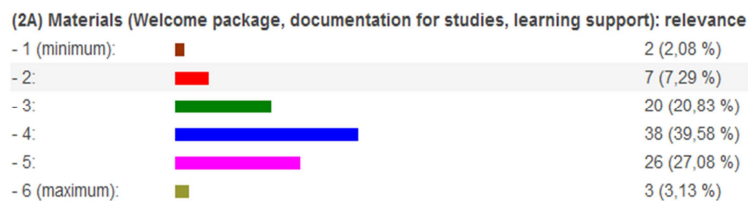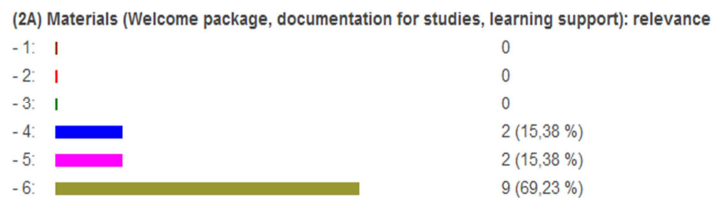

Figure 6. Feedback CSDP Common Module.

Figure 7. Feedback Stabilization and Reconstruction Management Course.

The following figure shows the feedback regarding a questionnaire submitted to a particular class of students. Attendees for the Army Staff Course are professionals, Captains and Majors, graduated in different Master Degrees with a minimum of 10-15 year experience in the Army. The course has a consistent part delivered as distance learning and a quite long residential phase. The first

question was about the difficulties encountered while using the platform, the second one requested a judgement on the structure and the organization of the online course while the third one focused on the overall efficiency of the VLE.
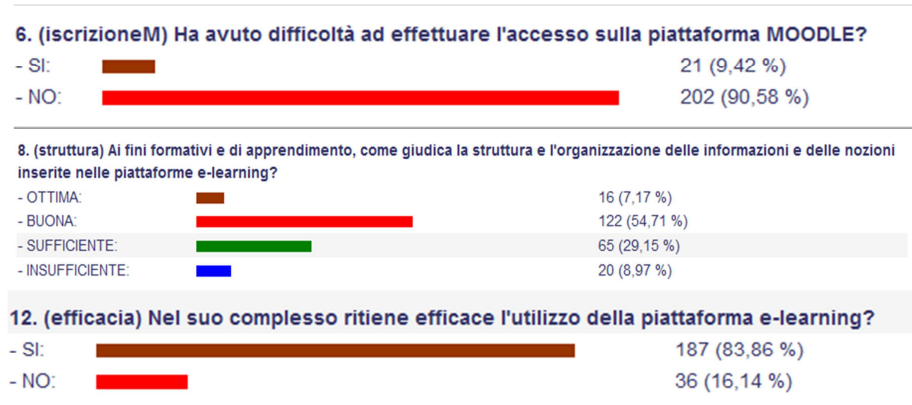

Figure 8. Feedback Army Staff Course.

According to the answers it is possible to state that some of them, maybe because of their age, probably had some problems in using the platform and the same students' final judgement is less positive for the structure and the efficiency.

Another questionnaire was submitted to university students about the use of VLE during their studies by using the Likert scale from 1 to 5 (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). The answers belong to different students' groups, in Figure 9 the military group and in Figure 10 the civilians.

Figure 9. Feedback of military students of Strategic Sciences.

Figure 10. Feedback of civilian students of Strategic Sciences.

Results are positive and encouraging to continue to use the platform during the learning process. It is possible to observe that civilian students assigned a lower value - even if it was positive - than did their military colleagues to the specific question regarding the capability to enhance the team working process. It is possible to suppose that this is related to a different evaluation about the capability of the platform to solve problems in a real simulated environment. The simulation is a

reality within the armed forces. These outcomes are encouraging and it is possible to affirm that the interactive didactic adopted for military and civilian purposes meets future requirements especially for those will be called to work in the field of Security and Defence of the EU and it is consistent with the same lines of development created by ESDC EAB-IG experts.

V.   CONCLUSIONS

The use of VLE as a support for a newer and interactive didactic will be the winning tool in order to prepare future professionals who are able to:

- collaborate in a multicultural environment;
- use different languages fluently;
- solve problems with colleagues;
- manage projects;
- have links with other colleagues around the world;
- perform multinational assignments;
- feel themselves European first and then citizens of the world.

For these reasons the COMFOR and UniTO decided to invest human and financial resources in this direction trying to work in cooperation with other local institutions and enlarging the partnership with European institutions and case by case also extra-EU countries. Following this path not only means to reduce costs but also to rationalize and project a learning process more suitable for the future of our students.

Reference Text and Citations

[1]   Lunardi, P., Henry, 2010. Punto di situazione sull'E-learning in ambito interforze. *In Atti della Conferenza Didamatica Roma 2010. Aica.*

[2]   Marchisio M., Spinello E., Torbidone G. and Rabellino S., 2016. La formazione e-learning avanzata per gli Ufficiali dell'Esercito attraverso ambienti virtuali di apprendimento. *In Proceedings of EMEM Italia, 2016.*

[3]   Clark, R.C. and Mayer, R. E., 2008. E-learning and the Science of Instruction. San Francisco. Pfeiffer.

[4]   Abdul Razzak, N., 2016. Strategies for effective faculty involvement in online activities aimed at promoting critical thinking and deep learning. *In Education and Information Technologies*, vol. 21, 881–896.

[5]   Lave, J., 1991.Situating Learning in Communities of Practice. *In Perspectives on socially shared cognition*, Washington, American Psychological Association, 63-82.

[6]   Mihalova, G., 2006. E-learning as internationalization strategy in higher education [online]. Baltic Journal of Management, Vol. 1 No. 3, 270-284. Available from: www.emeraldinsight.com/1746-5265.htm.

[7]   Bereiter, C., 2002. Knowledge Building. *In Enciclopedia of Education*, Second Edition, New York, Macmillan Reference.