



## Conference Proceedings for 2021 ISOMA

**Theme: Preparing  
Military Leaders to  
Effectively Resolve  
21st Century  
Security Challenges**



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# **An Education and Training Model to Prepare Officers for New Challenges and Scenarios**

**Enrico Spinello and Marina Marchisio**

**Abstract:** Future military leaders will be required to operate in new and increasingly complex scenarios and to respond to unexpected and often not currently imaginable challenges. It is important that, starting from basic training, officers acquire specific knowledge and develop key-skills, both professional and transversal, which allow them to face future tasks. The paper presents and discusses the model developed by the Education and Training Command and School of Applied Military Studies and the University of Turin. They, in cooperation, provide the upper part of military training and academic education for young officers. The path is composed of a bachelor's and a master's degree in Strategic and Military Sciences, which belong to a class of degrees dedicated to the armed forces. Distinct curricula were developed according to different branches and services. The analysis carried out on the model is in accordance with the five dimensions considered in the model: multi-disciplinarity; military training; internationalization; e-learning; and Civ-Mil interaction. For each dimension, the training objectives, the strategies implemented, the resources, the strengths, the risks, and the difficulties encountered are described. The actions for monitoring and evaluating the model quality are also illustrated. Finally, some reflections are reported on how some characteristics of this model can be successful also in a lifelong learning perspective, useful for officers who, during their career, will be called by the Institution, or for personal reasons, to continue their studies to keep up to date, to specialize or to attend courses for carrying out missions and special assignments.

**Keywords:** Military Education; Officers Training; Security and Defense Education.

## **Introduction**

Future military leaders will have to operate in new and increasingly complex scenarios and respond to unexpected and often not currently imaginable challenges.<sup>1</sup> It is important that, from basic training, officers acquire specific knowledge and develop key, professional and transversal skills, which allow them to face the tasks they will be called to perform more easily and with situational awareness.<sup>2</sup> In recent decades, the training of officers has been a subject of

attention of the European Union (EU); through its documents, the EU has indicated the strategic principles to be adopted in order to build a European defense policy and culture.<sup>3</sup> No less important, however, are the global international contexts within those countries which have been collaborating for some time through strategic alliances, such as NATO, and which are asked to intensify their relations and their interventions in particularly delicate operational areas and in countries where the protection of the population and the territory is particularly complicated.

The IT-Army Education and Training Command and School of Applied Military Studies (ETC&SAMS) and the University of Turin (UNITO) have worked together for many decades in order to provide the best education and training for officers and, in 1998, a special cooperation was issued for managing new dedicated university courses. For the same reasons, some years later a dedicated university school was created, the Interdepartmental University School in Strategic Sciences (SUISS), which coordinates the activities carried out by civilians, military, professors, tutors, and instructors. The SUISS includes nine of the 27 departments of UNITO covering different areas: legal, political, economic, scientific, and biotechnological-medical.

Until the 1980s, the entire cycle of studies for officers was based on a two-year engineering course. Then, officers attended different university courses in a traditional area such as political sciences, computer sciences, management, mechanical and civil engineering according to their preferences or military requirements. Not everybody was admitted to an additional fifth year in order to complete their studies and obtain a master's degree. The military and the university programs were not well harmonized. In 1997, a Legislative Act introduced exclusive and specific criteria for military education and, in 2001, a specific class of university degrees for defense and security was created for all armed forces. In accordance with the Bologna Process, the cycle of studies was organized on a three-year bachelor's degree, plus a two-year master's degree. The entire cycle is conceptually designed as a full five-year course.

In this context, the Education and Training Command and School of Applied Military Studies of Turin (COMFOR-SA) and UNITO designed and built together a model which allows 120 to 130 officers each year to get the bachelor's degree, lasting three years, and the master's degree, two years, in Strategic Sciences, which belong to this class of degrees dedicated to the training of military personnel of different military services. These university degrees contain distinct curricula depending on the branches and specialties that they belong to.

This paper presents and discusses this model according to its five peculiar dimensions and using the data we collected. This model is constantly updated in order to meet the different needs that may arise, and, during the COVID-19 pandemic period, it allowed to maintain didactic continuity and redefine some formats to respond to future scenarios.

### **The Training Model**

The model was developed by ETC&SAMS and UNITO and was created to answer the following questions:

- Which training objectives are most useful for future military leaders who will be called to operate in new and increasingly complex scenarios and to respond to unexpected and often not currently imaginable challenges?
- How to organize the training of officers from the beginning to make them acquire specific knowledge and develop key professional and transversal skills, which allow them to face the tasks they will be asked to perform more easily and with situational awareness?

The model envisages a co-planning of all the activities by both institutions that work through official bodies such as the SUISS Council and the Degree Courses Council, but above all through working groups on specific topics, such as e-learning and internationalization, composed of members of both institutions who collaborate together, comparing and bringing different perspectives. The Commander is one of the members of the SUISS Council so that he can be updated in real time and actively contribute to the discussion from his privileged point of view.

The model relies on the use of a dedicated interdepartmental structure in order to:

- facilitate the organization, planning and implementation of academic teaching and training activities;
- dedicate staff who are familiar with the peculiarities of university training in the field of security and defense;
- promote multi-disciplinarity because the teaching staff, composed of civil and

military teachers, comes from different departments and disciplinary fields;

- maintain a balance between military and academic subjects; and
- optimize the resources invested in terms of infrastructure and personal resources.

For example, the entire infrastructure for e-learning was equally funded by the two institutions and also teacher training, help desk, and platform management activities are carried out in cooperation by both institutes.

Another strong point is the simultaneous provision of the training of military and civilian students in two different and parallel bachelor's and master's degrees. Officers practice the collaborative learning and team working with their civilian colleagues from the first day, and this enables them to be much more prepared to enter their professional life during which they will have to interact with civilian personnel and work in favor of entire populations. When military students carry out exclusively military training activities, civilian students carry out training internships at companies or public or private institutions in order to acquire experiences that facilitate entering the world of work. Some civilian students carry out internships at Italian or EU foreign military institutions. Distinct curricula are created in order to diversify the preparation of civilian students.

Finally, the model aims to favor three processes that are considered fundamental:

- integration of the officers' training;
- internationalization; and
- transition to digital as a paradigm capable of supporting all training activities.

The first focuses on a broad-spectrum officer training obtained through a strong theoretical and practical multi-disciplinary training that allows a solid preparation, the development of transversal skills and the harmonization between theory and practice. We want to promote the ability to continuously learn also in terms of professional updating.

Through the second, a European—but not limited to Europe—security and defense culture is developed. During their university career, officers carry out activities abroad or in Italy during which they meet colleagues and teachers from other EU member states.

The third allows, through the use of new technologies and their potential, to improve

teaching and learning methods, make them more effective and more appropriate to the times, while also helping officers understand how to improve simulations and training activities when they are operated.

## **Analysis and Discussion**

The model analysis is carried out according to the following five dimensions included in the model:

- multi-disciplinarity,
- professional training,
- internationalization,
- e-learning; and
- interaction between military and civilian students.

For each dimension the objectives, the strategies adopted, the resources used, the strengths and the risks and difficulties encountered are described using qualitative and quantitative data.

### **A. Multi-disciplinarity**

**Objectives:** to achieve a broad-spectrum preparation which allows officers to acquire knowledge, skills and competences in different fields in order to have the reading keys to operate in different contexts and to be able to deal with professionals from different sectors.

**Strategies:** To achieve the multi-disciplinarity, teachers from different disciplinary sectors and from different university departments of UNITO are involved. Nine out of twenty-seven departments contribute to the didactic activities of SUISS. Others, such as the Department of Psychology and the Department of Foreign Languages and Literatures, contribute with their own professionals. Teachings in the field of engineering are entrusted to professors of the Polytechnic of Turin. Teachers are invited to set up their teaching in such a way as to provide a solid basic literacy and to deepen the aspects that are of greater interest for the career of an

officer. For example, in the field of administrative law, the rudiments are taught, and the aspects linked to public contracts and public work are studied in depth, the students being the future officers of a public institution. Or, in the teaching of the leading English language, after reaching an advanced medium level, also military English useful for operating in international contexts, is taught. Moreover, interactive educational activities such as formative assessment, learning by doing, debates, workshops, collaborative learning have been added to the more traditional teaching methods. In this way, transversal skills are also developed such as digital ones, problem solving, communication, argumentation, leadership, and the ability to team up.

**Resources:** To achieve the multi-disciplinary approach, financial and human resources have been put in place by ETC&SAMS and UNITO in order to have dedicated and on-site teaching by teachers from different fields. Since the engineering and architecture sectors are not present at UNITO, a specific agreement has been signed with the Polytechnic of Turin. Military lecturers work with their civilian colleagues to design training activities.

**Strengths:** The teaching is carried out at the military institution following calendars and timetables in accordance with the needs of the military institution. During the various university courses, students go on field visits (for example, to local public offices, according to the topics, and on battlefield tours to places where historical battles took place), participate to related events such as competitions or conferences on topics they are studying in order to feel protagonists of their training path. The degree theses of the bachelor's and master's degrees seek to investigate issues of interest to the armed forces.

**Risks and Difficulties:** The training program is very intense; therefore, if a student lacks organization, he risks to fail some of the tests and exams. To overcome this difficulty, the students are divided into small groups supported by a captain/major who acts as a tutor. To facilitate the study, additional exercise sessions are also organized during which students can question and carry out guided activities. A difficulty that has not yet been overcome is that SUISS has dedicated administrative staff but does not yet have 100 percent dedicated teaching staff. This would facilitate the coordination of teaching and research on topics of interest to the armed forces.



## **B. Professional training**

This includes specific training activities of various types that are not part of any academic teachings. They are recognized in terms of European Credits Transfer and Accumulation System (ECTS) and represent one third of all educational activities (100 ECTS out of 300 of the entire cycle).

**Objectives:** Achieve high quality military preparation and training by dedicating the necessary time.

**Strategies:** In order to allow the officers to obtain high quality specialized training, a university course was designed with the purpose of enhancing and recognizing part of these activities in terms of European Credits Transfer (ECT) and Accumulation System ECTS. The specific training periods are planned well in advance and inserted within the academic year in such a way as to not interfere with lessons and exams.

**Resources:** Military teaching staff is responsible for practical lessons on military issues, every branch receives a specific and dedicated training. A large number of specialized military personnel such as instructors of various sports (swimming, athletics, skiing, horse riding, shooting, etc.) and the sport facilities (gyms, swimming pools, and an athletics field) are available on site, while shooting ranges, military camps, and mountain training areas are not too far from the premises.

**Strengths:** The internship activities are carried out partly on site but partly through special periods outside, such as branch schools and summer camps. In order to reduce logistic and training efforts a complex exercise, called “UNA ACIES,” is planned and carried out every year where all the activities of the military institutes, in strong cooperation with military academy, non-commissioned officer (NCO) academy, and military high schools, are combined in order to perform the proper training with the right equipment.

**Risks and Difficulties:** All training activities are condensed and must be completed within the university course timeframe. If for some reasons some activities must be repeated there is a risk of not being able to achieve the bachelor’s or master’s degree on time. When it happened, in very few cases, a flexible approach was used, and students were able to achieve it with a minimum of delay compared to their colleagues.

### **C. Internationalization**

The model tries to answer the current context and in the scenarios that are being envisaged where collaboration among EU member states and strategic alliances such as NATO are increasingly important and indispensable.<sup>4</sup> Strongly international training is adopted not only in terms of mobility, both outgoing and incoming, but also to create more international curricula.

**Objectives:** Develop the ability of officers to operate in any international operating theatre with colleagues from all over the world, to fit into different cultural contexts and to create collaborative networks.

**Strategies:** To reach a strongly international training many actions were adopted. First of all, the outgoing and incoming mobilities through intense mobility programs and exchanges of students, teachers and staff of different duration and modalities (short, long, virtual, in presence and blended intensive programs (BIP)) were increased. Depending on the mobility, the student either attends a full semester or takes part in an international module or carries out a degree thesis or a traineeship. Seventeen bilateral agreements were signed with other European basic officers' education institutions/universities dealing with security and defense education.

The military institute participates in the "European Initiative for the exchange of young officers, inspired by ERASMUS" (called also EMILYO).<sup>5</sup> As member of this initiative, it offers common modules and regularly sends students to other member states' short-module programs.<sup>6</sup> Also, civilian students are admitted to this program in accordance with the specific topics offered. Since 2013 every year two Common Modules (CM), such as Common Security and Defence Policy (CSDP) and Law of Armed Conflicts (LOAC), are offered. In 2020, due to the pandemic, for the first time the CM program was postponed and in the 2021 four CMs were offered, with the introduction of a new one (Biosafety and Bioterrorism). The European Community Action Scheme for the Mobility of University Students (ERASMUS) Programme is also used, as UNITO has the ERASMUS Chart and students (military and civilians) can benefit of a medium-long study program mobility (minimum of 3 months to 1 year) and/or traineeship (minimum of 2 months). At the moment a total number of 17 bilateral agreements was signed with EU universities, with 63 study program mobilities and 10 for traineeship.

Moreover, in order to have more international curricula, two visiting professors from foreign universities are invited every year for the provision of two courses entirely held in English; teachers are asked to adopt the Content and Language Integrated Learning (CLIL) methodology. Teachers have also implemented four dedicated open online courses held in English (many others are available as additional) among the compulsory modules of the curriculum (Military Sociology and Leadership, International Law, History of European Integration, Mathematical Modelling) for a total of 27 ECTS. They are available to facilitate the recovery of teachings by outgoing students and to offer training activities in English to incoming students. To facilitate the participation of officers in the mobilities, an immersive week is organized at the beginning of each semester on military English. Civilian students can attend a cultural inter-comprehension course which aims to develop the ability to integrate into different cultural contexts.

Other activities are provided in English such as the Stabilization and Reconstruction Orientation Course (SROC) and, since the academic year 2021-2022, some university modules (Military Sociology and Leadership and International Humanitarian Law of Armed Conflicts) will be in English, and students will have the possibility to select them instead of the equivalent modules in Italian.

**Strengths:** The internationalization program, contemplating various actions, involved many officers. The number of participants per year to the common modules moved from two in 2009 to sixty-eight in the pre-COVID last year, while in 2019-2020 this number was stopped at fifty-five. All feedback received at the end of the various common modules are very positive. The range of the average feedback is between 4.8 and 5.40 (Linkert scale of 6). These international activities are strengthened by collaborations within European Erasmus+ Key Action 2 Strategic Partnership projects such as the Military Gender Studies (MGS) project, coordinated by the Portuguese Military Academy of Lisbon (Portugal) and involving the “Vasil LEVSKI” National Military University of Veliko Tarnovo (Bulgaria) and the “Nicolae BALCESCU” Land Forces Academy of Sibiu (Romania), which addresses the issue of gender mainstreaming within the training of officers.

**Risks and Difficulties:** In general, it is particularly challenging to create exchange, because each state has its own organization for the education and training of officers.

Fortunately, within the EU, the European Security and Defence College (ESDC), Brussels, is creating a shared framework that allows to overcome many obstacles. Last year, the biggest difficulty was the COVID-19 pandemic which slowed down internationalization activities. Luckily, the virtual mobility agreements immediately signed with the Military University of Technology, Warsaw (Poland) and the open online courses made it possible to continue, albeit with more effort, with these activities.<sup>7</sup> We have not yet managed to create an international semester with other universities because some internal reviews of the Italian Army regarding the curricula have postponed it.

#### **D. E-learning**

E-learning represents a winning tool for improving the quality and the potential of officer education. It allows to add different forms of teaching to the traditional face-to-face one: blended, purely online and hybrid.

**Objectives:** The main objectives are using digital education to update training; increasing the use of technologies to facilitate and make teaching and learning more adaptive; fostering collaborative and cooperative learning; and introducing methodologies that use artificial intelligence.

**Strategies:** The main strategy was to develop a Digital Learning Environment (DLE) that is a virtual space in which students and teachers work together, independently, in groups using various technologies and sharing content. An intense e-learning program was implemented in 2013 and went through several phases: 1) strengthening of the structures, 2) integration of the Learning Management Systems used by ETC&SAMS and UNITO, 3) training of teachers to develop their digital skills, produce interactive materials, and update their teaching methods.<sup>8</sup>

**Resources:** Since 2013, many human financial resources have been invested in e-learning in terms of infrastructure, training, and content production also in a lifelong learning perspective.<sup>9</sup> UNITO has a great deal of experience in digital education, and, within the Computer Science Department, there are MOODLE developers who have contributed to the creation of the entire e-learning architecture for the training of officers. Many financial and human resources have been invested since March 2020 because the COVID-19 pandemic has

required moments of forced distance training with a consequent increase in the use of the DLE. The number of logins to the DLE was 10,244 in 2019, 83,208 in 2020, and 52,239 in the period January to April 2021. In 2020, the web conference sessions were 515 with 81,194 accesses while the resources made available were 2,798 and viewed 208,331 times. Thanks to funding from the Compagnia di San Paolo Banking Foundation, UNITO intends to invest in the production of further open online courses and micro-credentials.

**Strengths:** The robust e-learning program undertaken in recent years has made it possible to implement the internationalization program described above and not to interrupt the training activities during the COVID-19 pandemic.<sup>10</sup> In accordance with the indications of the Digital Education Action Plan published on September 30, 2020, and making use of the EU funding supplementary call on digital, released in October 2020, ETC&SAMS and UNITO have started the European Project DIGICODE, in collaboration with the Military University of Technology of Warsaw (coordinator), the “Vasil LEVSKI” National Military University of Veliko Tarnovo (Bulgaria) and the “Nicolae BALCESCU” Land Forces Academy of Sibiu (Romania), whose main aim is to develop the digital skills of trainers in the field of security and defense.<sup>11</sup>

**Risks and Difficulties:** No particular risk was encountered, but there is necessity to introduce, in order to support the teachers, new competent figures such as instructional designers, tutors and Learning Management System managers.

## **E. Interaction Between Military and Civilian Students**

It starts from the third year until the fifth year, because for the first two years, the officers attend the military academy in Modena. The number of admitted civilians is 60 every year at the bachelor’s degree level, while there is no limitations at the master’s degree level. The total number of civilian students is around 300 while the military students are 360.

**Objectives:** To teach and train the military and civilians to collaborate and tackle problems together in order to be ready for future collaboration in operational theaters.

**Strategies:** To facilitate interactions between military and civilian students, it was decided to have them attend lessons, international modules, and extracurricular activities such as conferences and sports facilities, together. In the classroom and remotely, they get used to

collaborating, cooperating, exchanging ideas, discussing various topics, and working as a team. Civilian students can carry out internships within ETC&SAMS or even at some foreign academies/universities with which we have signed a bilateral agreement.

**Resources:** To do this, ETC&SAMS made available classrooms for all didactic activities, sport facilities, and spaces for recreation. The digital learning environment created by ETC&SAMS and UNITO was designed to be interconnected and the open materials are available to be shared.

**Strengths:** The existing interaction between military and civilians is unique in Italy and not so widespread in Europe. It represents an added value and a first seed to give birth to a profound culture of security and defense within the company. The presence of civilians during lessons and seminars gives a different point of view about the same topics. The satisfaction of students who carry out international activities or internships at foreign academies/universities is always extremely high (5.8 in to 6 Likert Scale). In the comments released by graduates at the end of the master's degree, there is often a "unique and very formative opportunity that allows you to grow by collaborating and building friendships with people who will work in different but parallel contexts."

**Risks and Difficulties:** No particular risk has been identified. Some difficulties encountered concern the inclusion of the title of master's degree obtained by civilian students in the public competitions of the Ministry of Defense to recruit civilian personnel. The situation is being monitored.

### **Data, Monitoring, and Quality**

In order to monitor the model some actions and initiatives were undertaken to constantly check the response to training needs, to intervene immediately at various levels where the need arises, to develop new solutions and experiment with them. This constant monitoring also helps to maintain good standards of training quality.

First, there was a large and assiduous participation in international activities by students. To participate, they must apply, and the applications received are always more than the available places. This shows that the initiatives meet the interest of the students and fulfill their

expectations. To monitor the various activities carried out, the numerous data present on the platform are analyzed (logins, unique logins, access to resources, time dedicated to activities, errors made, results achieved in the tasks with automatic evaluation).

Questionnaires are then administered at the end of the various activities to students and teachers to collect their feedback. The results achieved in the various practical and theoretical tests, in presence and on the platform, contribute to checking if the training objectives are achieved and, in case of failure, we try to understand the reasons and to intervene with support activities.

Each academic year, there are two training sessions for teachers, before the start of each semester, and during the summer, the work to update infrastructure (classrooms, hardware, software) are carried out to keep the equipment efficient. Every three years, a cyclical examination of the bachelor's and master's degree programs is carried out and meetings with the social partners are held to collect observations and indications. These two actions are required by the Ministry of the University.

On the military side additional feedback and questionnaires are requested to the students while a firsthand feedback is required to the Regiment Commander of the unit where officers spend a five-week operational traineeship before receiving the first assignment.

Finally, continuous research is carried out in the field of digital education to find increasingly effective and efficient solutions. For example, in the context of learning analytics, techniques are being studied that allow teaching that can be reshaped in real time based on the data collected and methods of analysis that allow institutions to carry out enlightened data-driven educational policies.

## **Conclusions**

In the paper we discussed the model developed by the Education and Training Command and School of Applied Military Studies and UNITO for the officers' training. The analysis studied the five dimensions present in the model: multi-disciplinarity; military training; internationalization; e- learning; and Civ-Mil interaction. We can say that the model presents characteristics that allows it to be used also in a lifelong learning perspective, useful for officers

who during their career will be called by the institution, or for personal reasons, to continue their studies to update themselves, to specialize or to attend preparation courses for carrying out missions and special assignments.

Some experimentations in this direction were made. First, some military exercises and simulations of near-real time operations were carried out to test how the system would react. The responses were extremely positive, and this means that it is also necessary to invest in highly updated post-graduate training. Second, the idea and the architecture of the Portal of Italian Army was designed in Turin taking advantage of the experience gained. The model is able to involve a high number of officers from different positions, with different roles and distributed throughout the territory.

The scenarios in which the officers will have to operate will be more and more new, more and more hybrid: in the same way, their training will need to help them develop understanding and decision skills in order to make them valid military professionals and true leaders.

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**Marina Marchisio** is full professor of complementary mathematics at the Department of Molecular Biotechnology and Health Sciences of the University of Turin and Delegate of the Rector for the development and promotion of the university’s digital education. Her research is focused on learning and teaching mathematics and STEM disciplines with digital methodologies and innovative technologies. She coordinates the Digital Education for Learning and Teaching Advances (DELTA) Research Group. She is a member of the Problem Posing & Solving Working Group of the Italian Ministry of Education. She coordinates several research and didactic projects; has held and organized numerous conferences; and is the author of many publications on digital education.



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