

## MODERNIZATION OF AIR FORCE EDUCATION – ‘SYSTEMS FOR AERIAL SURVEILLANCE AND SECURITY’ PROJECT

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**Abstract:** *The current paper presents an analysis of the ‘Systems for Aerial Surveillance and Security’ (SASS) project, carried out under the aegis of the European Union's Erasmus + [4] programme conducted by “Henri Coandă” Air Force Academy (AFAHC) in collaboration with partners from Poland and Bulgaria. The project aimed to initiate collaboration between the military universities of the European Union in order to establish common competences that the graduates in the field of aviation will acquire upon the completion of their education. One of the reasons for the development of this project was the need to modernize the education in the AFAHC and update the curricula in accordance with the new technologies equipping the military systems and with the modern teaching / learning methods in the civilian higher education. The running of the project and its finalization led to the design of an education curriculum of the Life-long learning type and an e-learning platform. The analysis of the project by means of various satisfaction questionnaires, applied following certain stages of the project, revealed controversial results.*

**Keywords:** *systems for aerial surveillance and security; Erasmus project; e-learning; modernization; strategic partnership; communication, satisfaction questionnaires*

### 1. INTRODUCTION

Romania, as an integral part of the various international institutions, must meet the performance standards imposed at this level and adjust its needs in this regard.

The national defence and security system is one of the systems most affected by changes in public policies through the need to modernize the technical defence systems. As a result, the military education institutions, the trainers of the future practitioners of the strategies and the technical systems in the field of security have to modernize their learning / teaching methods and develop efficient institutional models.

One of the simple methods to achieve this goal is to take over and adapt the models and methods of learning / teaching of the civilian educational environment.

Following the initiation of the collaboration with universities of similar profile in Europe, under the aegis of the Erasmus programme, a working group of professors from the War Studies University (WSU) in Poland and “Vasil Levski” National Military University (VLNMU) in Bulgaria was set under the leadership of AFAHC.

On first meetings, the working group members concluded that the focus of the project should be on such aspects as:

- modalities of professional development for the improvement of competences with regard to the use of the new approaches and technologies of the defense systems;
- teaching / learning modalities in the context of international cooperation between military academies and civilian universities.

Accordingly, the management of the military higher education institutions needs to modify the approach to education and to adjust it in accordance with the existing standards of the civilian institutions.

The development of the project aimed at the improvement of education within the AFAHC, WSU and VLNMU, in two directions:

- Designing a curriculum that will ensure common competencies for future employees in the air defense and security structures;
- Developing a modern learning / teaching system materialized in an e-learning platform.

## **2. DEVELOPMENT of SASS**

From the standpoint of aviation, the airspace, both the controlled and the uncontrolled one, is divided by the civil and military air transport. There are organizations, both at national and international level, holding responsibilities in the field of drawing up the regulations necessary for the planning and supervision of the airspace activity.

The airspace surveillance is accomplished by air traffic controllers, backed up, in their activity by civilian or military radars.

A good use of the technical systems dedicated to these activities requires a good understanding of their structure and their mode of interconnection.

Considering the facts mentioned above, the project was intended to be a beginning in the uniformization of the competences obtained by the military students with the competences of the graduates of the civilian universities in the same field of activity. The final purpose of the project took into account the aeronautical regulations according to the ICAO.

The analysis accomplished by the project team considered the following aspects:

- The specializations necessary for the management of this field of activity (pilots, ATCs, Radar and Air Defence specialists);
- The amount of information and the speed of change of the operation techniques and technologies in any field of activity;
- Activity in international context and the interaction between people belonging to different cultures.

The results of the project materialized into:

- Development of a curriculum;
- Accomplishment of an e-Learning platform (meant for both learning and teaching activities)

### **2.1. DEVELOPMENT of the CURRICULUM**

We observe a wide range of competences considered and enunciated by the project team, as a result of the large number of specializations involved in the activities in the above-mentioned field, of the airspace security:

- communicating intelligibly, meaningfully and appropriately in English in aviation context;
- applying aeronautical rules properly for achieving aviation safety;
- applying basic meteorological knowledge on daily basis aviation activities in order to maintain a good level of aeronautical safety;
- contributing to a genuine comprehensive approach to air force protection and safety management;
- analyzing data issued by navigation systems and radars.

These competences aim at a standardization of the specialists' competencies within the existing services on all airports, civilian or military.

The first stage of the project was finalized with a curriculum designed for an interval between 2 and 3 months, according with the plan of study and curriculum of each university involved in the project. This curriculum can be applied to any of the universities involved in the project, through a system of recognition of studies by transferable credits attributed to each discipline of the curriculum. It consists of 6 disciplines designed to cover the following competencies: Air Force Safety and Security, Safety Management, Aviation English, Basic Principles of Navigation, Air Law, Meteorology.

Initially, the curriculum developed by the project was thought to be achieved in English, as a common international semester during the Bachelor cycle of studies. In this case, the way of financing the students' mobilities and those of the teachers between the 3 partner universities of the project, but also of other possible participants, was discussed. The fact that the project was meant to be open to all those interested in improving and specializing in the field of security and military management was considered, too. Because a source of permanent funding could not be detected, alternative solutions were devised. In fact, the problem of financing and the viability of the semester had been identified as a possible drawback since the proposal phase of the project. The first solution was the implementation of this curriculum online, as a distance learning study plan. To achieve this goal, the e-Learning platform was developed.

The second solution was to transform the curriculum into a lifelong learning program. Thus, the completion of the project meant a new phase for the AFAHC, which continued and obtained the approval of the Ministry of Education for its transformation into a postgraduate study program of the lifelong learning type.

On the first stage of this accreditation, the program is open to graduates holding a Bachelor's Degree from Romania. For greater accessibility, we will try to obtain and meet, for the second solution – lifelong learning program, the requirements necessary for its development in English. This will allow all of the Romania's partner countries to participate in this program.

These steps were made following the opinion polls conducted throughout the 2 years of project development.

The opinion polls were applied to a number of about 70 people, within 5 activities. From this point onward there are presented only some of the questions pertaining to the opinion polls that indicate the connection between the areas of activity of the respondents with the objectives and results of the project.

According to Fig. 1, respondents perform their activities in the field of aviation.

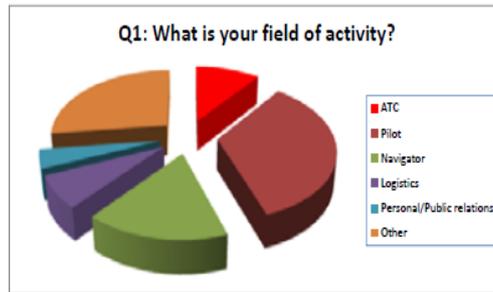


FIG.1 Field of activity

As a result, in figures 2, 3, and 4 it can be observed that the degree of satisfaction for the accomplishment of this educational plan at the beginning of the project, in the intermediate stages and at the end of it, does not undergo major changes, the percentage in which a positive answer (at least very good) was obtained ranging from 92.31 %, to 91.25% respectively 85.07%.

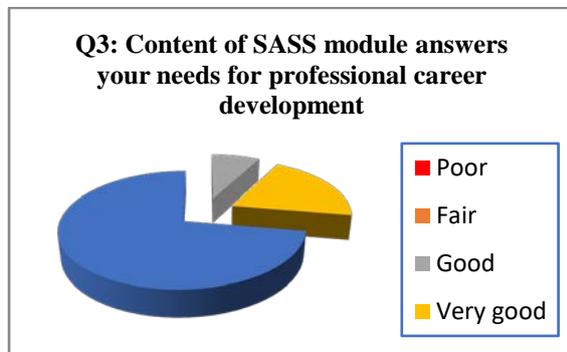


FIG.2 At the beginning of the project



FIG.3 The intermediate stage

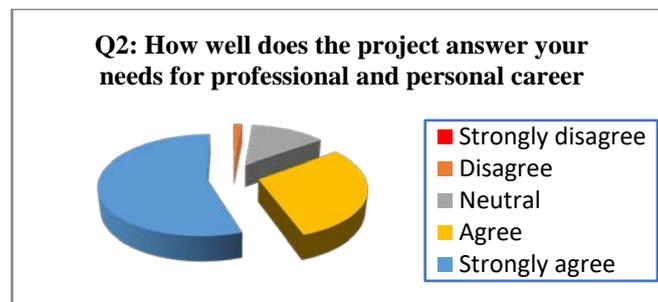


FIG.4 Final stage of the project

The percentage differences are the follow-up of the respondents' specializations, some of them not being directly involved in the field of aviation but in its related fields (Fig.1).

## 2.2. DEVELOPMENT of the E-LEARNING / TEACHING SYSTEM

In order to transfer curriculum in the virtual environment, an e-learning platform was set up to be managed by each of the 3 universities partnering in the project (figure 5).

The lessons for each discipline, respectively, the entire curriculum can be accessed by any university, any collaborator at national / international level of the 3 universities, but only with their approval.

The 6 disciplines that are part of the curriculum were shared between the 3 universities in the project. Each university was responsible for developing lectures and workshops for 2 disciplines through 2 specialist professors.

The initial existence of only one specialist for each discipline in the curriculum required the development of a training-the-trainers type of training. It was carried out in the second year of the project and aimed at training a specialized professor in each university, for each of the disciplines of the curriculum.

The e-learning platform allows the permanent updating of the courses destined to each discipline but also teaching processes through the conference system. The advantage of this system is given by the possibility of carrying out the teaching process without the physical presence of the teacher in the classroom.

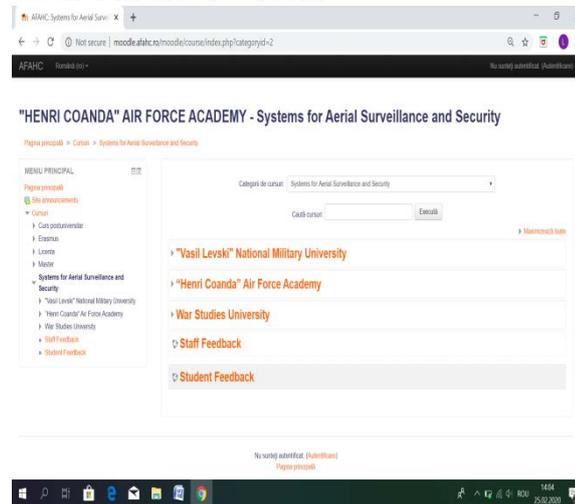


FIG.5 a. Capture of the platform managed by the three universities

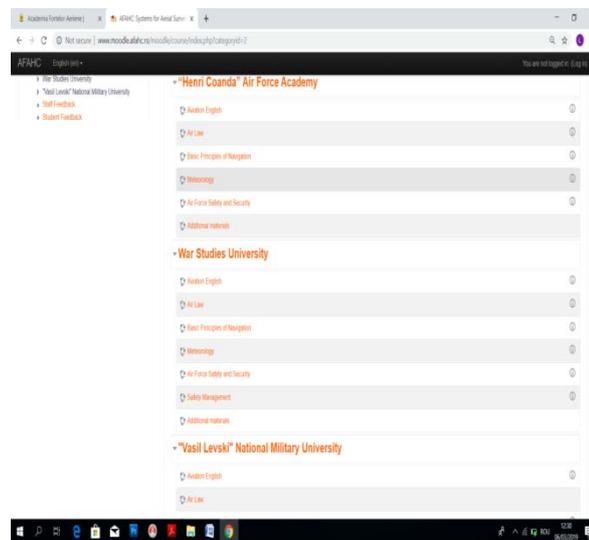
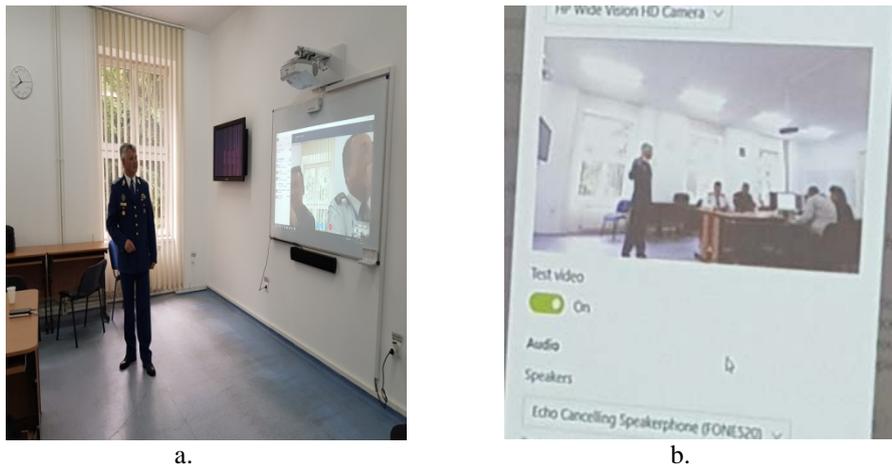


FIG.5 b. Capture of the platform managed by the three universities

In figures 6a and 6b there is presented the connection of the 3 universities through the conference system.

The connection between the 3 universities was made using the same e-learning system. All that was needed was a high-performance webcam with 360-degree view and internet connection.



**FIG. 6a./6b.** Captures at the time of checking the videoconference system in 2 different universities.

Although widely used in civilian universities, the e-learning system is gradually entering military universities. It should be noted that there are still universities of this profile that have not implemented such a system.

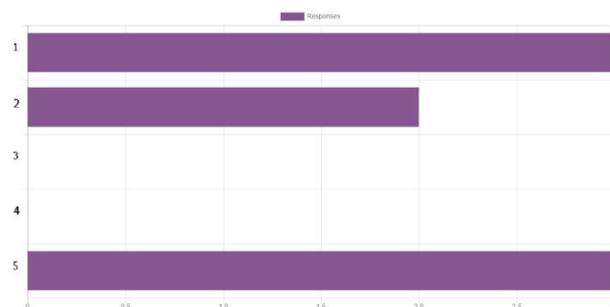
The development and completion of the project required an evaluation process. This was carried out after the implementation of a blended mobility phase, which aimed to find the level of satisfaction among students and professors of the 3 universities partnering in the project but also at the level of their collaborators.

The implementation of the e-learning system allowed the online evaluation of the degree of satisfaction. Satisfaction questionnaires [1] uploaded on the platform were completed at the end of the online courses and had surprising results.

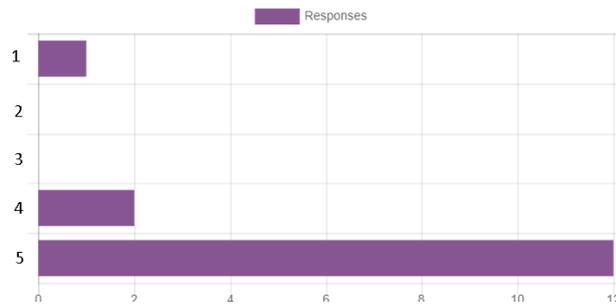
The question "How easy is it to use the e-Learning platform of the SASS project?" with possibilities of answers ranging from 1 (strongly disagree) to 5 (totally agree) was answered by both students and teachers and the findings are shown in fig. 7 (students) and fig 8 (teachers).

Regarding the use of the platform [2] the opinions of students differ from the teachers.

The students' opinion was divided between the two extremes, with an emphasis on the classroom teaching / learning style that has the advantage of interacting with teachers and colleagues (Fig. 7).



**FIG. 7** Students' opinion – capture on the e-learning platform

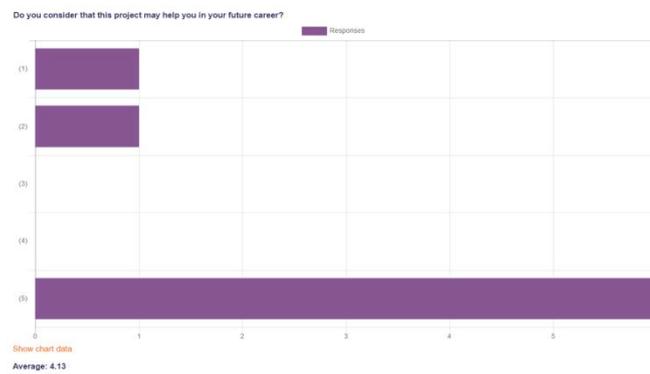


**FIG. 8** Teachers' opinion– capture on the e-learning platform

In contrast, the teachers expressed a clear intention to adapt to the new teaching / learning techniques (figure 8). I liked most the opportunity to use modern teaching methods to deliver lectures and practical classes” was the most frequently obtained answer to the question” What did you like most about this event / project?” at the end of the ”blended mobility” activity.

### 3. CONCLUSION

The project opened the way for joint curricula and it was an opportunity for teamwork at the level of students and professors and it granted the possibility of intercultural exchange owing to the team formed by the three universities from three countries.



**FIG. 9** Students' opinion – capture on the e-learning platform

Although the use of e-learning platforms is not absolute novelty, it has been observed that the military higher education is somehow reluctant to using them, perhaps due to the profile of the three universities. Students prefer the direct interaction and this assertion is supported by the answers to the questions in the satisfaction questionnaires.

The added value of the project was given by the answer to the question ”Do you consider that this project may help you in your future career?”, presented in figure 9.

The answer to this question is yes. However, there are different points of view on how the use of the e-learning platform influences the acquisition of technical skills and abilities.

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