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SYSTEMS FOR AERIAL SURVEILLANCE AND SECURITY – A STEP FORWARD FOR AIR FORCE ACADEMIES

Summary. This paper is a report in brief of the project that "Henri Coanda" Air Force Academy, in collaboration with partners from Poland and Bulgaria, carried out under the aegis of the Erasmus + program of the European Union by the end of 2018. The project was called Systems for Aerial Surveillance and Security (SASS). The project proposed the initiation of a process of uniformisation of competences necessary for the people involved in the field of aviation, namely obtaining a joint study plan for pilots, air traffic controllers, and air surveillance officers [3]. It opened the way for cooperation between the Air Force Academies that began a joint semester of study. Achieving the objectives of the project meant introducing an online teaching/learning system based on an e-learning platform. The e-learning features have been fully utilised through the introduction of a videoconference system that allows teaching/learning activities for professors/students at a distance. The completion of the project was carried out by evaluating the results obtained at different stages. The analysis was based on

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the feedback from the main target groups - students, teachers and beneficiaries of the graduates. Two periods of teacher and student mobility were required for evaluation and analysis. The students' and teachers' opinions on the implementation of the curriculum by means of the e-learning platform were analysed in detail.

Keywords: distance learning, e-learning, Erasmus project, evaluation, strategic partnership, videoconference system

1. INTRODUCTION

Whether it is about national security, education or the economic environment, Eastern European countries have to constantly adapt their public policies and update their defence systems to the demands imposed by the various international organisations. This happens because joining the NATO and the European Union have been important desiderates.

As a result, each of these countries has passed and is still undergoing transformations that are felt in its own military structures. The modernisation of the existing technical systems in the military structures and the efficient use of the already existing technology within NATO require a change of mentality in the future graduates of military education.

The project proposed:
- teaching/learning modalities in the context of international cooperation between military academies and civil universities,
- modalities of professional development and improvement of skills for using new equipment and technologies in defence systems,
- shaping the psychological and moral behaviour by accepting multiculturalism in the context of multinational missions.

In the context of the military and civilian cooperation, it is necessary to modify the concept of military education and bring it to line with the standards in civilian education. This process is a tough one and at "Henri Coanda" Air Force Academy, it has been initiated by considering a strategy for the institution's modernisation. As a consequence of AFAHC education's opening to various European programs, it has proposed to develop an education plan in cooperation with the War Study University of Poland and Vasil Levski National Military University in Bulgaria, under the aegis of Erasmus +.

2. PROJECT'S RESULTS AND OUTCOMES

From the point of view of universities of military profile, the labour market is divided into:
1. The civilian labour market specific to the field of aerial surveillance and defence, hereby mentioned.
2. The military labour market, which although in the international context is always actual, is continuously diminishing and reorganising.

The project started from the idea of uniformising the competences of the military students (future pilots, air traffic controllers, radar and air defence officers) with the competences of the graduates of the civil universities in the same field of activity. This was the end goal of the

project and it took into account the air laws that are specific to each environment, military or civilian, in which an activity takes place.

Other aspects that were taken into account were: the amount of information and the speed of change in equipment and technology in any field of activity, the need for professional reconversion where needed.

Moreover, in the context of the different alliances, one must consider the interaction between groups belonging to various forms of training, as well as culture.

The activities were carried out over two years and focused on two main directions:
- designing a curriculum appropriate to the purpose of the project,
- upgrading the teaching/learning system to reflect current realities.

The periods of experience exchange, simply called mobilities were achieved as an integral part of the project evaluation.

The design of the curriculum (and the syllabus for each discipline) began by establishing the competencies necessary for the aviation, security and defence aviation employees. To establish these competences, it was taken into account that the field of aviation, airspace management and security includes many related specialisations [2]. The curriculum consisted of six disciplines, the same number of disciplines is currently preserved, (and related materials) that can be studied by pilots, air traffic controllers, radar and meteorology officers.

The second development direction of the project, which is the subject of this paper, consisted of the accomplishment of a modern education tool in the civilian university environment, namely, an e-learning platform and a videoconference system. Each of the two directions has been developed in two steps, one for obtaining this tool and the other for its evaluation.

3. ONLINE SYSTEM

The e-learning platform was designed to be simultaneously managed by the three universities participating in the project.

For this reason, looking at the main page of the platform, it can be noticed that each university has its own section for which it has administrative rights. In each section, the courses and information related to the six disciplines set forth in English were uploaded and then translated into the official language of the country of each university.

The decision to translate the materials into the national language of the participant universities was taken in view of an easier updating of materials and better use by the students of each university.

In Figures 1-3, there are presented captures of the platform from which its organisation and the project-related materials can be observed.

Each university contributed two specialists to the project, so the organisation of the study plan in all three universities involved the permanent mobility of specialised professors between the three universities and the parallel training of trainers. As a result, it was concluded that a videoconference system was needed to allow the distance learning process.

By doing so, the circumstance in which one of the professors could not carry out the teaching activities at a given time and at a particular university was eliminated.

In Figure 4 are presented captures at the time of checking the videoconference system, when first used online, from the sites of two of the universities involved in the project (first figure – AFAHC and the second – WSU).
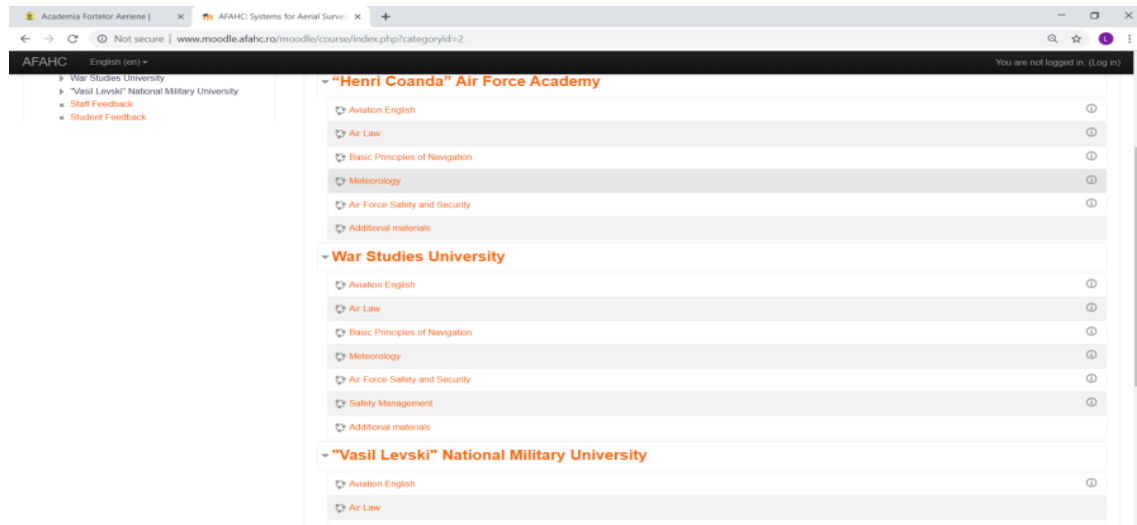
Fig. 1. Capture of the platform managed by the three universities
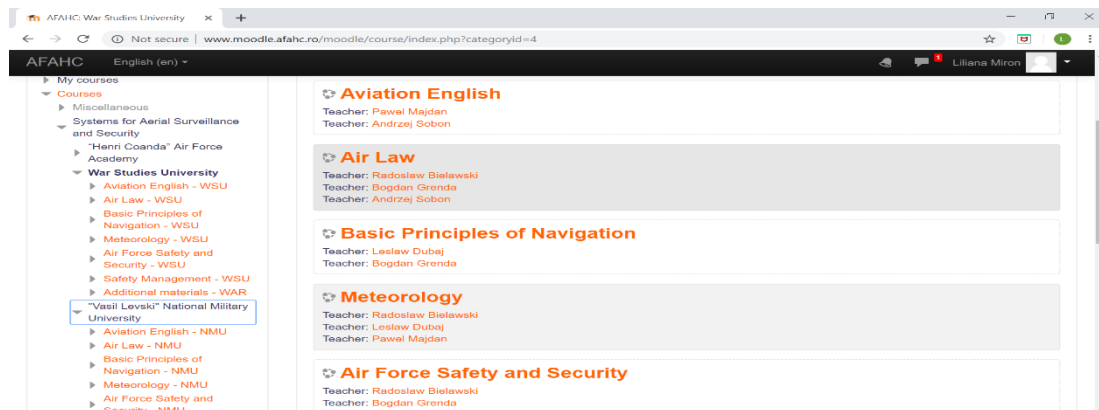

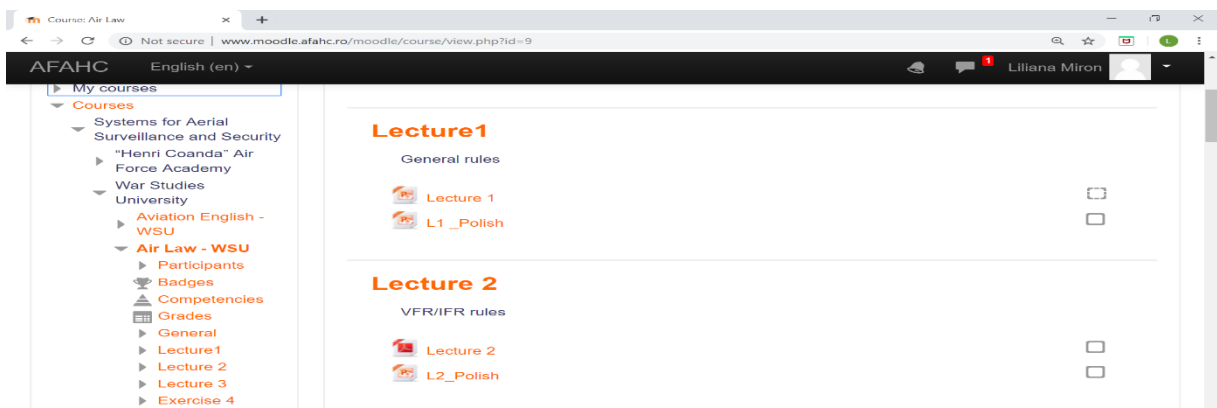Fig. 2. Capture of the courses design for the plan of study

Fig. 3. Capture of the lectures inside of the courses

The achievement of the system implied the connection of the three universities through the platform, by means of high-definition webcams.
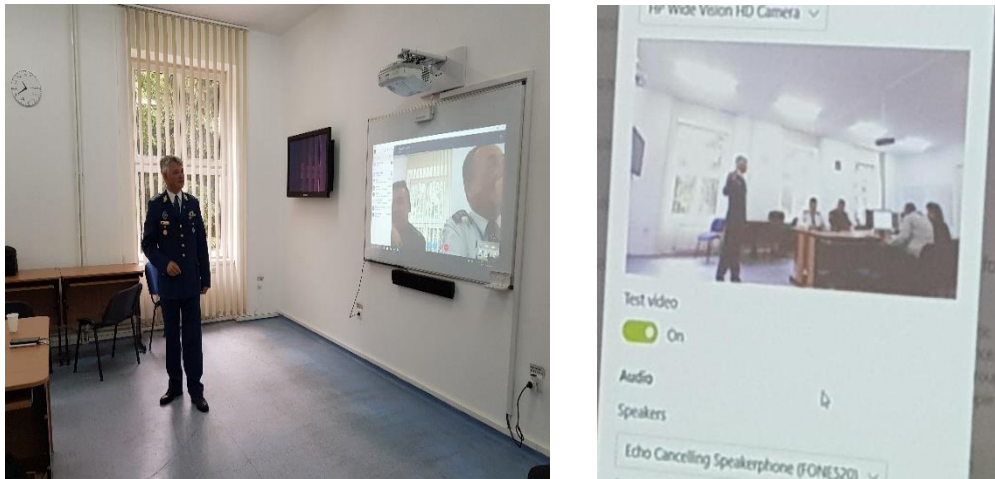
Fig. 4. Captures at the time of checking the videoconference system in 2 different locations (AFAHC) and (WSU)

4. PROJECT EVALUATION

The implementation of this phase of the project was followed by a comparative analysis of the views of the main target groups at the beginning and at the end of the project. Self-evaluation took place at the end of a "blended mobility" period. It consisted of two weeks of mobility in one of the partner universities and two weeks of online courses on the platform. The evaluation was achieved through satisfaction questionnaires completed at the end of the online courses with surprising results with regard to the use of the e-platform.

The development of the project has tried to make the most of the facilities offered by the e-learning system. Thus, the last satisfaction questionnaire to which students and teachers responded was made using the system created [1].

Students' opinion with regard to the use of online systems was different at the beginning and at the end of the project and also different from teachers' opinion.

Figure 5 presents students' views on the project at its inception.

In Figure 6 the opinions of students and teachers at the end of the project are presented. The questions about the e-learning platform that was created and how it was used by students and teachers were:
1. "How easy is it to use the e-learning platform of the SASS project?"
2. "Which of the following words would you use to describe the project goals and the new method of teaching (e-learning and videoconference system)?"

Respondents' opinions differ from one target group to another.

The percentage of students who consider a classroom teaching/learning system to be preferred was higher than that of those who prefer the online system. They invoke the advantage of interacting with teachers and colleagues, despite the existence of videoconferencing (Figure 6a).

Professors have easily accepted this online system, as can be seen in Figure 6c.

Regarding question 2, the answers spread on the wide range, from *High quality* to *Impractical* (Figure 6b).
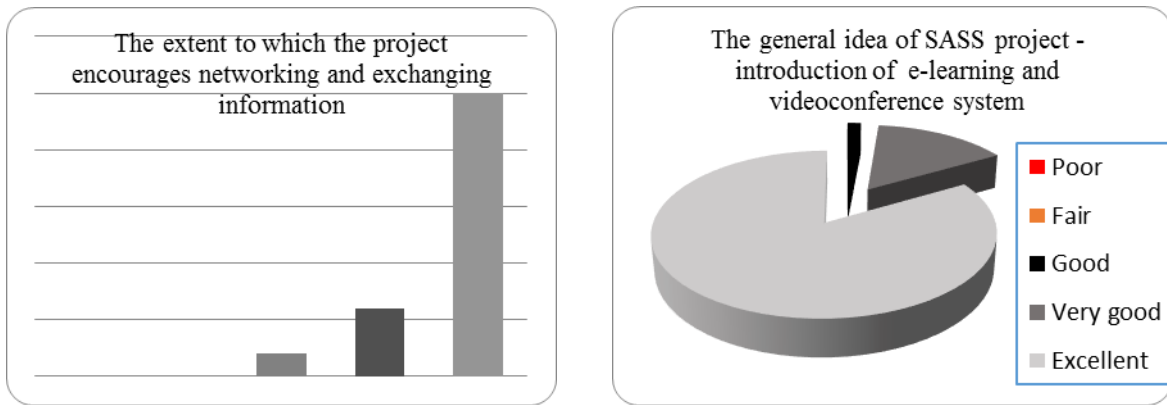
Fig. 5. Students' opinion at the beginning of the project for two different questions
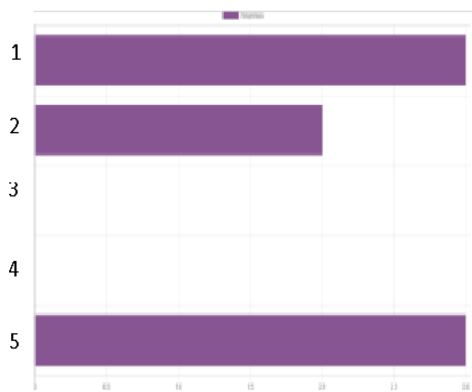

Fig. 6a. The opinions of the students at the end of the project (*How easy is it to use the e-learning platform?*)
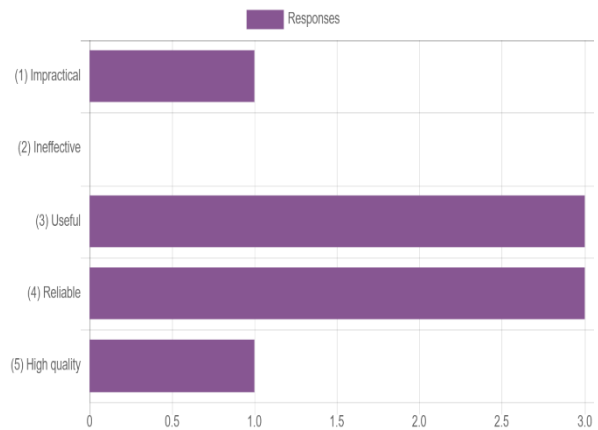
Fig. 6b. The opinions of the students at the end of the project (*Which of the following words would you use to describe the project goals and the new method of teaching?*)
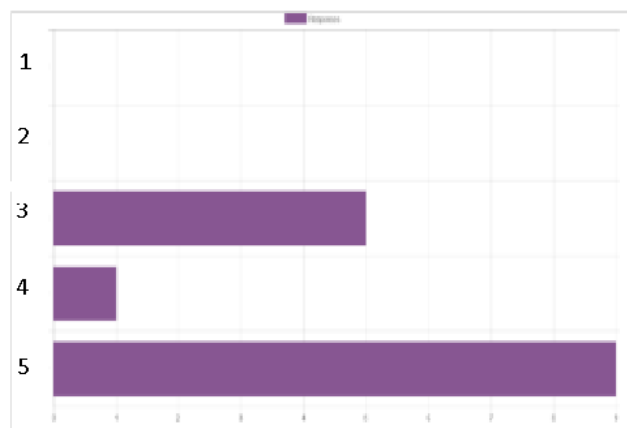

Fig. 6c. The opinions of the teachers at the end of the project

Setting up the platform has been an important project milestone.

The setting had to keep record of:
– the achievement of the project objectives in translating the whole project into Polish and Bulgarian,
– the need to administer the platform (the window belonging to each university) by each university.

Thus, the use of the platform has become more difficult, as it was noticeable in the answers of students and teachers, where the same difference of opinion is observed. In Figure 7a (students) and Figure 7b (teachers) are presented the answers of the two categories of respondents for which pro represents the value 5 and against the value 1.
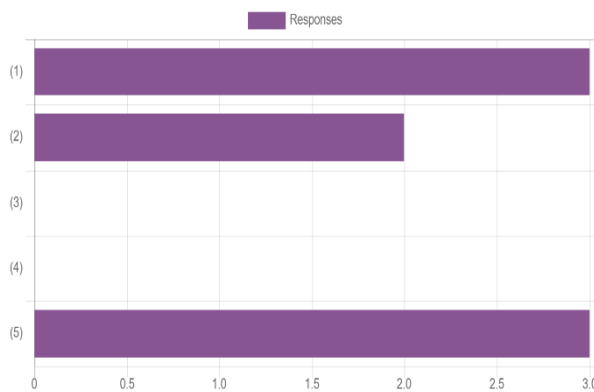

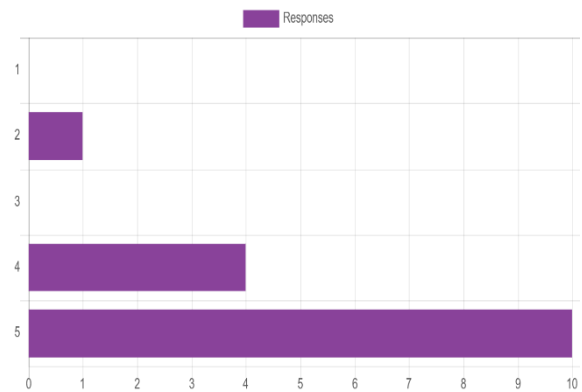| Fig. 7a. The students' opinion after the platform' settings | Fig. 7b. The teachers' opinion after the platform' settings |

Because the final beneficiaries, the players on the labour market, were a target group of the project, their opinion was capitalised during a multiplication event at the end of the project.

The participants in the multiplication event responded affirmatively in a very large proportion (Figure 8) to the question "Do you think that the results and goals of this project may help future graduates in their career?"

5. CONCLUSION

1. If at the beginning of the project, the percentage of respondents who thought the plan of study was dedicated to the pilot's specialisation, because of the change of 1/3 of the students participating to the blended mobility, that percentage changed in favour of air traffic controllers (the first line in the figure below).
2. In the higher education of the Air Force (at the level of the project – the three universities) there is a gradual transition to the online environment but this type of education in the military field (more practical) has a slow ascending trend, unlike the civilian environment.

The opinion of the target group formed by the final beneficiaries, employers of the future graduates remained unchanged: it is necessary to introduce a study plan that can ensure the formation of common competences in the field of aviation and the creation of a modern learning and interconnection system with the partners.

Fig. 8. Participants' opinion for "*Do you think that the results and goals of this project may help future graduates in their career?*"

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