Elm və İnnovativ Texnologiyalar Jurnalı Nömrə 24, 2022. 67-83
DOI: 10.30546/2616-4418.24.2022.67

LEVEL OF SELF-AWARENESS OF TRAINING AMONG STUDENTS IN THE DEPARTMENT OF AIR TRAFFIC CONTROL AT THE FACULTY OF AERONAUTICS AND SPACE SCIENCES[1]

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1. Introduction

In the literature, there are various definitions of training. The process of providing information, talent, and skill development is broadly defined as training (Özçelik, 2018). Training is done to transfer knowledge and skills related to the work that they do or will do (Mondy, 2008). Training enables people to behave in accordance with the job's goals and objectives by changing their behaviors or

[1] The summary of the article was presented at the 2nd International Congress on Aviation Management

providing opportunities for the development of new habits and abilities (Şimşek, 2002).

Currently, as an outcome of the aviation industry's rapid change and growth, the demand for aviation training has increased. Constant updates are made to training structures to allow employees or students in the aviation industry to become well-trained experts and to ensure the necessary development within the scope of the updated areas of expertise with the growing industry.

National and international legislation governs the training of air traffic controllers, who are in charge of ensuring safe, fast, and regular air traffic flow. Selection and training criteria are constantly reviewed and re-evaluated in order to select the best candidates for the training program (Seamster & Redding, 2017). Significant changes have occurred at the national and international levels in recent years regarding the training of air traffic controllers, one of the most important actors of flight safety. It is critical to maintain training awareness by ensuring that these changes are implemented by training organizations, lecturers, and trainees.

Awareness, defined as the most fundamental requirement for an individual to interact with his environment throughout his life cycle, demonstrates to individuals how they perform a task. Individuals can better direct their lives when they are aware because they have the necessary feedback to organize themselves and their surroundings. People's consciousness levels rise in tandem with their awareness levels (Rohrer, 2002).

There is a rise in the degree of awareness about training with the increase in the level of awareness of the students so that they can do their profession in the field they are educated in the future. The level of awareness also guides students at a critical juncture in their lives, deciding whether or not to continue their studies.

2. Purpose, limitations, sample of the Research

2.1 Research purpose

The purpose of this research is to determine the training structure of the students of the Air Traffic Control Department of the Faculty of Aeronautics and Space Sciences (FASS ATC) of Eskişehir Technical University and their awareness levels regarding the relevant national and international documents that regulate training. For this purpose, answers to the following questions were scrutinized;

1. What is the level of awareness of the students of the Air Traffic Control Department of the Faculty of Aeronautics and Space Sciences regarding the training objectives, methodology, measurement-evaluation principles, and training steps of the "Air Traffic Control" training?

2. Do the students of the Air Traffic Control Department of the Faculty of Aeronautics and Space Sciences follow the national and international documents related to the "Air Traffic Control" training?

2.2 Research Method

A survey model was applied in this study. A survey is a research approach that aims to describe a past or present situation as it exists. The individual or object that is the subject of the research is tried to be defined in its own conditions and as it is (Karasar, 2012). Data were collected by questionnaire method. The questionnaire is an effective and written data collection tool that allows access to the desired information in a short time and makes descriptions that are crucial (Balcı, 2004).

The research was assessed according to the training period and gender variables. In order to evaluate the awareness levels, two separate structures for the training structure and training-related documents were created in the questionnaire. In the first structure, the aim, methodology and measurement-evaluation principles of the "Air Traffic Control" training of the students and their awareness of the training steps; in the second structure, an answer was sought whether the students followed the national and international documents related to "Air Traffic Control" training.

Descriptive statistical methods were utilized while evaluating the survey data. For the 5-point Likert Scale used in the research, individuals were asked to indicate their opinions about the propositions given, from very positive to very negative options. According to this; A scale of (5) strongly agree, (4) agree, (3) undecided, (2) disagree, (1) strongly disagree was used. Scale results are spread over a width of 5.00-1.00=4.00 points. This width was divided into five and the levels determining the cut-off points of the scale were determined. The criteria in Table 1 are based on the evaluation of scale expressions and factor (dimension) scores.

Table 1. 5-point Likert scale

Description	Scale	Range	Interpretation
Strongly disagree	1	1,00 - 1,79	Very low
	2	1,80 - 2,59	Low
	3	2,60 - 3,39	Average
	4	3,40 - 4,19	High
Strongly agree	5	4,20 - 5,00	Very High

2.3 Research Limitations

The research is limited to the students who participated in the online survey and was shared with all department students. The fact that participation in the survey is voluntary determines the boundaries of the survey.

2.4 Sample

The study sample of the research consists of Eskişehir Technical University Faculty of Aeronautics and Space Sciences Air Traffic Control, and its sample consists of 92 students who continue their training. As 15 of these students registered for the 2022-2023 academic year, a questionnaire was announced to 78 people. A questionnaire was applied to 44 students.

3. Training concept for Air Traffic Controllers

The necessity of the training received by the controllers, who play a key role in the aviation industry, while doing such a job directly related to human life, comes to the fore. Air traffic controller training is divided into two main modules, these are; theoretical and practical training. Air traffic controller training in Türkiye is carried out through two methods. The first one is the courses organized by DHMİ (General Directorate of State Airports Authority), which is the air navigation service provider, and the other one is the undergraduate level training in Air Traffic Control departments through universities. While the training given within the scope of the course can be given as modular, the training given within the scope of the university are in an integrated method. While candidates for modular training are instructed for the unit or airport in which they work, all modules in the air traffic controller profession are covered in universities.

Training for air traffic controllers; as shown in Figure 1, it is a process that starts with the basic training given at the undergraduate or course level and continues with continuation and professional development training throughout their entire professional life.

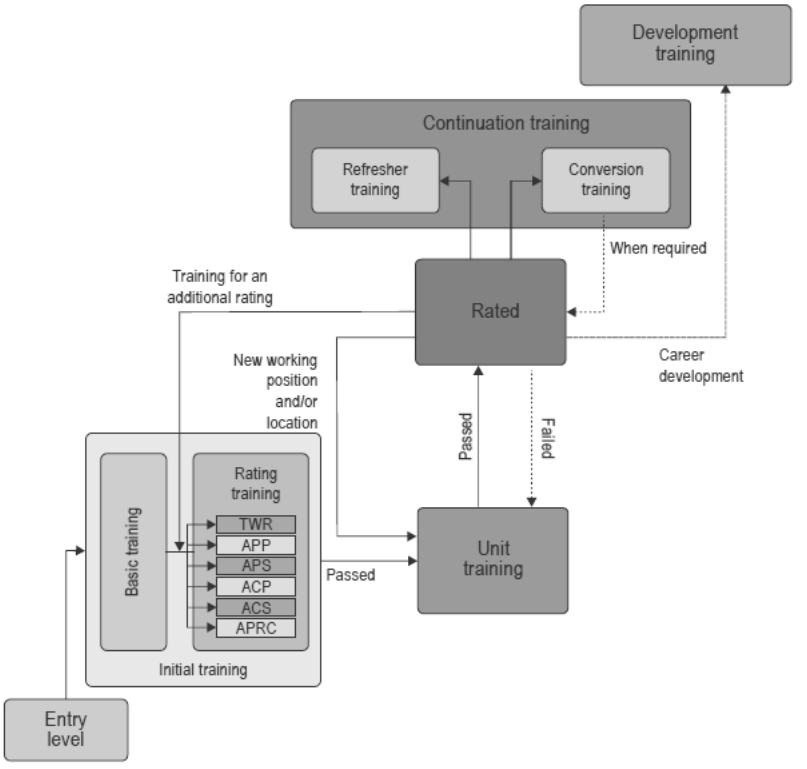

Figure 1. Air traffic controllers' training process (ICAO, 2017)

Candidates for air traffic controllers who are successful as a result of special selection criteria begin their careers as trainee air traffic controllers. Trainee air traffic controllers receive basic training as well as at least one degree in the training provided at the course level. Candidates who complete the training successfully receive a credential for student air traffic controller. With this certificate, they attend unit training that include pre-on-the-job and on-the-job training. Candidates who successfully complete the training are entitled to take the air traffic controller license exam. Candidates who successfully pass the exam are given the title of assistant air traffic controller. If they have any degree of approval, assistant air traffic controllers can be promoted to air traffic controllers.

3.1. Initial training

Trainee air traffic controller is defined as the personnel who have not completed the basic air traffic control vocational course and who have been placed by the air navigation service provider in accordance with the public employment policy to be employed as an air traffic controller, and those who have attended air traffic control training in higher training institutions (DHMİ, 2019). From this perspective, initial training principles were published by ICAO in 2017 with "Doc 10056 Air Traffic Controller Competency-Based Training and Evaluation Manual".

National qualifications and principles determined within the scope of this handbook are specified within the scope of SHT-ATCO/EĞİTİM.

Initial training provided in vocational courses and higher training institutions in Türkiye consists of at least one-degree training together with basic training. The trainee air traffic controller student who successfully completes the training receives the air traffic controller certificate. In Türkiye, initial training consists of all basic and degree training, which is defined as integrated training in higher training institutions providing training at the undergraduate level, and degree training that encapsulates basic training and various combinations of the course degree (DGCA, 2019).

3.2. Unit Training

Students who do not have a bachelor's degree and do not have a degree and have lost their degree due to reasons such as Air Traffic Controllers, assignment, birth/military service, air traffic incident; It is the training organized within the scope of approved training plans for assistant air traffic controllers or air traffic controllers who want to obtain an additional degree (DHMİ, 2019).

3.3 Continuation Training

The career path of an air traffic controller necessitates ongoing training in tandem with ongoing aviation development. To keep his job, an air traffic controller must be adaptable to different applications as well as the demands of the day.

The training planned for operational air traffic controllers to maintain the validity of their licenses and develop their current competencies is known as continuity training. Continuity training consists of renewal training as well as transformation training that will be scheduled as needed (ICAO, 2017).

3.4 Development Training

Professional development training is the training given for the specialization of personnel with certain competencies among air traffic controllers and air traffic control department instructors of higher training institutions. Training of trainers, airspace designer training, and other training are evaluated within this context (DHMİ, 2019).

4. Changes in air traffic control training at the international level

International Civil Aviation Organization (ICAO) enhances policies and standards, observes their compliance, conducts studies and analyzes to ensure the sustainable growth of the civil aviation system at the global level (ICAO vision and mission). The regulations made by ICAO must be implemented by the member states, including Türkiye. Requirements for air traffic controllers are included in Annex 1, titled Personnel Licensing, to the Chicago Convention, which was signed and contracted on 7 December 1944 by ICAO member states. In the document, it is emphasized that air traffic controllers should have the skills, judgment and performance required to provide a safe, orderly and fast air traffic control service, in addition to the subjects that should be supplied at the level of knowledge (ICAO, 2018).

Under the new chapter titled "Training and Evaluation for Air Traffic Management Personnel" added Procedures-Training for Air Navigation Services (PANS-TRG) Doc 9868 on November 10, 2016, "Competence-based training and evaluation for air traffic controllers" was included. This section, it is aimed to establish the procedures to be followed when implementing a competency-based training and assessment program for air traffic training organizations, air navigation service providers and authorities (ICAO, 2015).

After the amendment on the PANS-TRG, an amendment was made in the Annex 1 with an effect date of 05/11/2020, in order to ensure the necessary harmonization. With the amendment, PANS-TRG and Doc 10056 for air traffic controllers to demonstrate the necessary competencies and for competency-based training and evaluation practices; it is determined that the documents "Competence-Based Training and Evaluation for Air Traffic Controllers" provide the informative path (ICAO, 2020).

In addition to these, Commission Regulation (EU) 2015/340 dated 20/02/2015 and numbered 2015/340, which determines the technical requirements and administrative procedures within the scope of licensing and certification of air traffic controllers was published by the European Commission (EASA, 2022).

Even though it is not legally binding in Türkiye, the licensing of air traffic control personnel, the growth of curricula suitable for all training types within the scope of the competencies required for air traffic controllers, instructor requirements, and the authorization of air traffic training organizations were all discussed in parallel with the advancements at the ICAO standards.

5.Changes in air traffic control training at the national level

Turkish Civil Aviation Law No. 2920 came into force after being published in the Official Gazette No. 18196 on 14/10/1983. The basis of the regulations made in all activities in the field of civil aviation, including air traffic management in Türkiye, is based on this law.

With the "Air Traffic Control Services Personnel Licensing and Rating Regulation (SHY-65.01)" published in the Official Gazette dated 31/01/2007 and numbered 26420, the principles regarding training are regulated in addition to the conditions such as license, certificate, health and degree for air traffic control personnel (DGCA, 2007).

Procedures and Principles on Air Traffic Control Training to determine the training required for air traffic control personnel and trainee air traffic controllers, the training organizations providing this training, and the procedures and principles regarding the duties, authorities and responsibilities of the trainers titled SHT-ATCO/EĞİTİM was published by the General Directorate of Civil Aviation on 12/03/2019 (DGCA, 2019). Along with the regulation, the issues related to training in the SHY-65.01 were detailed and regulations were made within the scope of the European Commission regulation dated 20/02/2015 and numbered 2015/340, as well as the PANS-TRG and Doc 10056. In addition, the creation and evaluation of competency-based curricula in all air traffic control training in Türkiye were put into practice. Thus, it tried to clarify the regulations within the scope of SHY-65.01.

In terms of training and employment, air traffic controller is a profession that necessitates the training of people with special abilities in an interdisciplinary structure. While students are expected to provide information such as mathematics, physics, aerodynamics, and meteorology, good oral and written communication skills, the use of standard phraseology, or the use clear and understandable English and Turkish language that do not cause misunderstandings in real-world situations, are expected. To meet these expectations, those receiving training should follow the rules and be willing to learn new things.

6. Findings and comments

In this part, the findings acquired as a result of the analysis of the data collected from the participants through the scales for the solution of the research problem are presented. Explanations and comments were made based on the findings.

The distribution of gender and training period information of the sample consisting of 44 people is shown in Table 2.

Table 2. Descriptive Characteristics of University Students Participating in the Research

Ref.	Groups	Frequency	Percentage
Gender	Male	39	%88.6
	Female	5	%11.4
Training period	1	5	%11.4
	2	1	%2.3
	3	8	%18.2
	4	1	%2.3
	5	11	%25
	6	0	0
	7	15	%34.1
	8	2	%4.5
	8+	1	%2.3

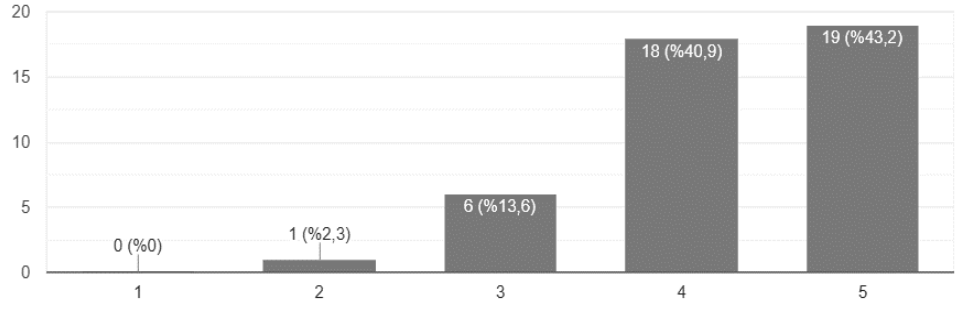

Figure 2. Training objectives for air traffic control training

As shown in Figure 2, it was understood that 84.1% of FASS ATC students who took part in the study are aware of their training's objectives.

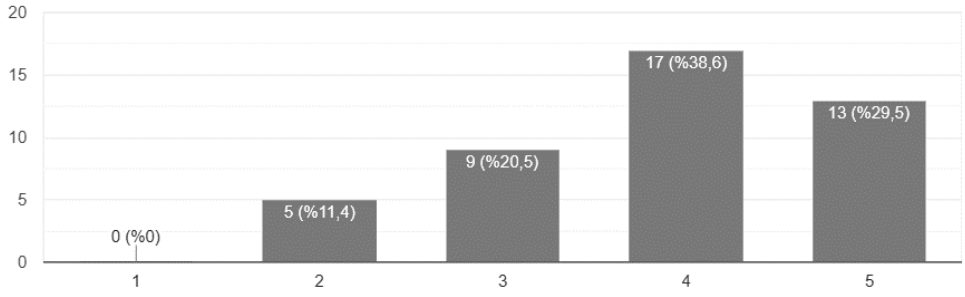

Figure 3. Applied training methodologies for air traffic control training

As shown in Figure 3, it was understood that 68.1% of FASS ATC students who took part in the study were aware of the training's methodologies.

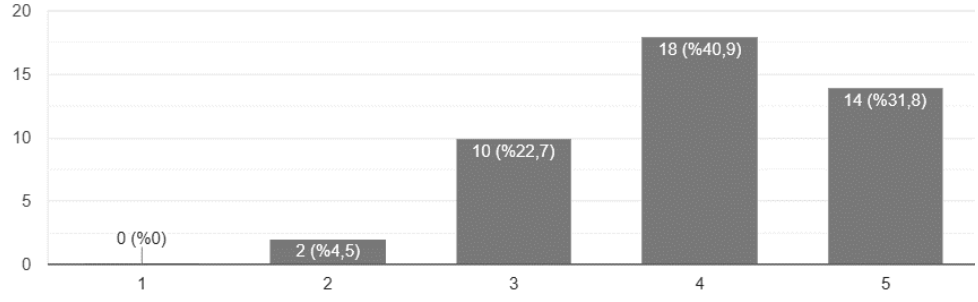

Figure 4. Measurement and evaluation principles regarding air traffic control training

As shown in Figure 4, it was understood that 72.7% of FASS ATC students who took part in the study were aware of the training's assessment procedures.

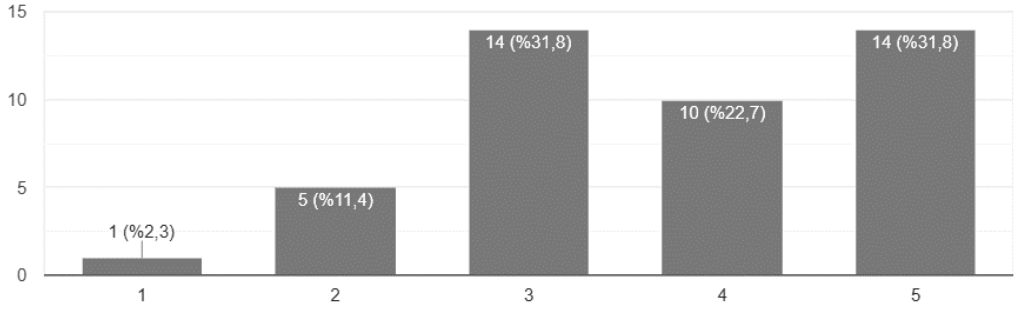

Figure 5. To be aware of the postgraduate steps of air traffic control training

As shown in Figure 5, 31.8% of FASS ATC students who participated in the survey were undecided about knowing the post-graduate stages of the ATC training; it was understood that 54.5% of them had awareness about the post-graduate stages of the ATC training.

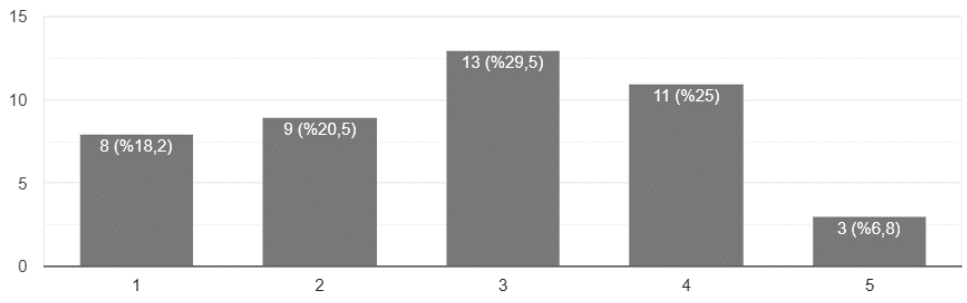

Figure 6. Follow-up of national documents related to air traffic control training

As shown in Figure 6, 29.5% of FASS ATC students who participated in the survey were hesitant to follow the national documents related to the ATC training; it was understood that 31.8% of them have awareness of the national documents related to the ATC training.

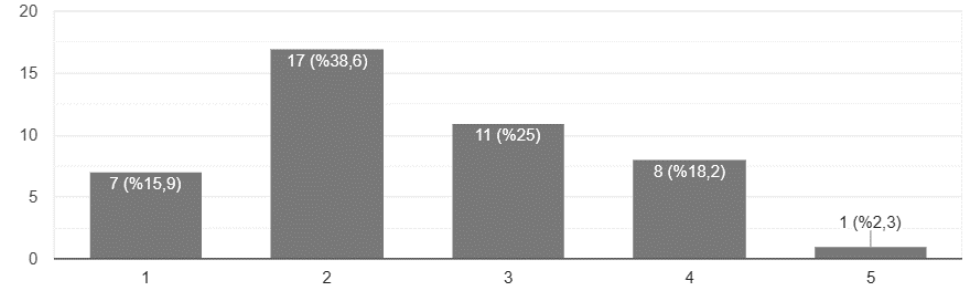

Figure 7. Follow-up of international documents related to air traffic control training

As shown in Figure 7, 54.5% of FASS ATC students who participated in the survey did not follow the international documents related to the ATC training; it was understood that 25% were undecided, and 20.5% were aware of the international documents related to the ATC training.

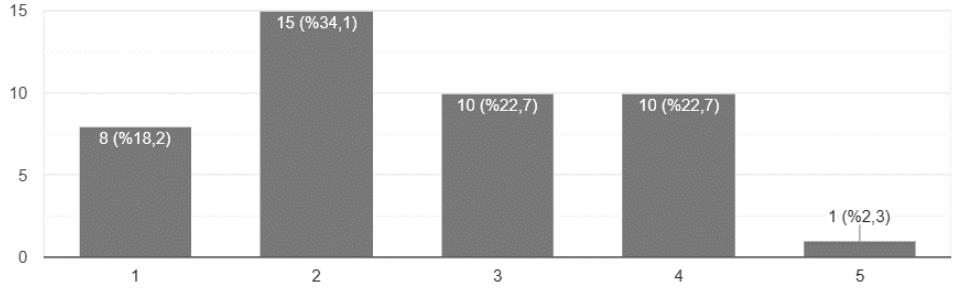

Figure 8. Literature survey to track changes related to air traffic control training

As shown in Figure 8, it was understood that 52.3% of FASS ATC students who participated in the survey did not do a literature review in order to follow up on changes in the ATC training, while 22.7% of them were undecided; It was understood that 25% of them have the awareness to follow the changes via literature review.

In this study, which was carried out to examine the level of awareness of FASS ATC students regarding the training structure and the documents that regulate the training; it was concluded that students are conscious of knowing their training goals, they have knowledge of training methodologies, assessment procedures, and they are mostly aware of the post-graduate stages of the ATC training. In contrast, students do not follow national and international documents pertaining to air traffic control training; it was determined that they did not conduct a literature review regarding the changes in the training process.

7. Discussion and result

The training system is the only way to have qualified human resources in the aviation sector. The level of awareness of the participants is one of the most important factors in the success of the training system. Air traffic controller is a professional occupation that necessitates the acquisition of knowledge, skills, and attitudes, as well as the acquisition of competencies, in order to adapt to the ever-changing aviation industry. In other words, there must always be a high level of awareness about the career field.

Air traffic controller candidates who began their undergraduate studies by successfully completing the selection criteria defined specifically for the field, as well as the basic knowledge of the profession, cognitive domain (3-dimensional thinking, decision making, prioritization, etc.), communicative aspects (expression and language ability, etc.), human relations. They obtain training in the practical application of certain skills, such as (team resource management, communication

strategies, etc.). The ultimate objective of training is to change or develop new behaviors and skills in students so that they behave in accordance with the aims and objectives of the air traffic controller vocation.

The high level of awareness of the students in the highly intensive theoretical and applied air traffic control training process enables them to provide feedback on the training, exhibit behaviors according to their expectations and direct their professional lives.

In this research, which was realized to determine the level of awareness of the students of the Air Traffic Control Department of the Faculty of Aeronautics and Space Sciences about the training structure and the documents that regulate the training, the majority of the students were aware of the training goals, had a good command of the training methodologies, knowing the principles of measurement and evaluation, and mostly related to the post-graduate stages of the ATC training. It was concluded that they have awareness. Conversely, students do not adhere to national and international documents pertaining to air traffic control training, and it was determined that they did not conduct a literature review regarding changes in the training attainment.

As a consequence, it was understood that related studies are necessary in order to track the changes in the training process and encourage FASS ATC students to follow national and worldwide documents.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Cite this article as: BAHADIR Seda, ÇINAR Ertan, TUNCAL Arif . Level of self-awareness of training among students in the department of air traffic control at the faculty of aeronautics and space sciences .Journal of Science and Innovative Technologies.Number 24, 2022.pp:67--83. DOI: 10.30546/2616-4418.24.2022.67

XÜLASƏ

Hava hərəkətliliyi və kosmos elmləri fakültəsi tələbələri arasında özünüdərketmə səviyyəsi üzrə təlim

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Aviasiya sektorunda peşəkar karyeralar arasında yer alan hava hərəkəti idarəçiliyi təhsili Türkiyədə bakalavr səviyyəsində və kurs olaraq verilir. Bu təlim üçün spesifikasiyalar sektorun təkmilləşməsinə və ehtiyaclarına cavab olaraq, yerli və beynəlxalq qurumlar tərəfindən daim yenilənir və seçkidən başlayaraq, bütün peşəkar həyatı əhatə edir. ICAO xüsusilə 2000-ci illərdən etibarən hava hərəkətinə nəzarət üzrə təlim standartlarında qaydalar və tövsiyələr qəbul etmişdir. Məktəb uğurları və məktəbdən sonra gözləntilərini qarşılamaq baxımından bu davam edən dəyişikliklərlə əlaqədar olaraq, tələbələrin akademik nailiyyətləri ilə bağlı özlərini dərk etmələri çox vacibdir.

Bu tədqiqatın məqsədi Əskişəhər Texniki Universiteti Aeronavtika və Kosmos Elmləri Fakültəsinin Hava Hərəkətinə Nəzarət Fakültəsi tələbələri arasında hava hərəkətinə nəzarət təliminin özünüdərketmə səviyyəsini qiymətləndirmək idi. Tədqiqatın birinci hissəsində hava hərəkətinə nəzarət təlimi izah edilir, ikinci hissədə isə hərtərəfli qiymətləndirmə aparmaq üçün məlumatlar təhlil edildi. Tədqiqatda tələbələrin təlim və qaydalara münasibətini təsvir etmək üçün sorğu modelindən istifadə edilmişdir. 5 ballıq Likert şkalası ilə anketlər vasitəsilə toplanan məlumatlar təsviri statistikadan istifadə edilməklə təhlil edilmişdir. Bu araşdırmanın nəticələrinə görə, Aeronavtika və Kosmik Elmlər Fakültəsinin Hava Hərəkətinin İdarə Edilməsi şöbəsi tələbələrinin təlimin məqsədi, metodu və ölçmə-qiymətləndirmə prinsipləri ilə bağlı məlumatlılığının nəticələri və təlimi tənzimləmiş, bu sənədlərdə dəyişikliklərin özünüdərketmə səviyyələrinə yaxınlaşmışdır.

Açar sözlər: *Hava hərəkətinə nəzarətçi təlimi, hava hərəkətinə nəzarət, özünüdərk*

РЕЗЮМЕ

Среди студентов факультета воздушной мобильности и космических наук, обучающихся студентам по самосознанию

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Управление воздушным движением среди профессиональной карьеры в авиационном секторе проводится на уровне бакалавра и курса в Турции.Спецификации для этого обучения постоянно обновляются и постоянно обновляются и начинаются с выборов, начиная с выборов, в ответ на сектор. ИКАО принял правила и рекомендации в стандартах обучения для управления воздушным движением, особенно с 2000 -х годов. С точки зрения успеха в школе и после школы, важно понимать академические достижения учащихся студентов.

Цель этого исследования состояла в том, чтобы оценить уровень обучения самосознанию по отношению к торговле воздухом среди студентов факультета контроля над факультетом контроля аэропортов и космических наук. В первой части исследования объясняется обучение управлению движением воздуха, и информация была проанализирована во второй части для проведения тщательной оценки.Исследование использовалось в модели опроса для описания отношения, учащихся к обучению и нормативным актам. Данные, собранные с помощью опросов с 5-балльной шкалой Лайкерта, были проанализированы с использованием статистики описания.

Согласно результатам данного исследования, отдел управления воздушным движением Аэронавтики и научного директората космического пространства, цель обучения и обучение измерения и принципов оценки измерения, изменения в этих документах приблизились к уровню самосознания.

Ключевые слова: *Тренировка контроллера воздуха, управление движением воздуха, самосознание*