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SKILLING, UPSKILLING, RESKILLING
IN THE FUTURE AIR TRANSPORT

D3.3 VET TRAINING

Design and Implementation of the training modules

(February, 2023)
(Partner Responsible: QSR)

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Partners		
	Deep Blue	dblue.it/
	QSR	www.qsr.consulting/
	INOVA+	inova.business
	Ecole Nationale de l'Aviation Civile	www.enac.fr/
	Institute of Aerospace Technologies, University of Malta	www.um.edu.mt/iat
	Università Telematica Internazionale UNINETTUNO	www.uninettunouniversity.net/en/
	Associação Portuguesa de Aeronaves Não Tripuladas	apant.pt/
	Eskisehir Technical University (ESTU)	www.eskisehir.edu.tr/en
	Kastamonu University	www.kastamonu.edu.tr/
	Fraport TAV Antalya	www.antalya-airport.aero/
	Lazio Connect	https://www.lazioconnect.it/en/
	EUROCONTROL	https://www.eurocontrol.int/

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List of Acronyms

Acronyms List	
ANACNA	National Association of Air Navigation Assistants and Controllers (Associazione Nazionale degli Assistenti e Controllori della Navigazione Aerea)
ATC	Air Traffic Controller
ATCO	Air Traffic Control Officer
HMIS	Health Management Information Systems
ICT	Information and Communications Technology
RPAS	Remotely Piloted Aircraft System
SM	Specific Module
TM	Transversal Module
UAV	Unmanned Aerial Vehicle
VET	Vocational Education and Training

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Executive summary

In the present document will be presented the tools that were built for the implementation of training modules. Furthermore, the deliverable intends to describe how the pilot sessions were structured, highlighting the necessity of having synchronous and asynchronous and theoretical and practical moments.

A summary of the partners' involvement in the project, along with their contributions to the sample collection, is also included, as well as a full description of the sample collected by each partner.

1 Project Overview

The skill-UP project aims to define the knowledge, skills and competencies required by the current and future workforce of the air transport industry so that the educational and training programmes can be better aligned to the requirements of different occupational profiles. The project looks at four occupational profiles: air traffic controllers, pilots, airport operators and drone operators.

The project seeks to develop initial and continuing VET training programmes based on suitable and innovative teaching and training methodologies and study pathways to aid in the skilling, upskilling and reskilling of the future workforce of the air transport sector. The skills and knowledge required by the future workforce will change, mainly because of an increase in digitization, automation and advancement in artificial intelligence. New competencies will become essential, amongst which are: the ability to work with data to perform descriptive diagnostics; predictive and prescriptive tasks; increased ICT knowledge, including multimodal interaction with advanced HMIs, automation and robotics; and teamwork and communication skills, in scenarios where the team would be composed of both humans and advanced automation. The skill-UP project aims to identify such new required competencies and address the training needs required to address the current gaps in skills and knowledge.

1.1 Purpose of the document

The main purpose of this document is to present the materials that were developed for the implementation of pilot sessions. For this, the following were developed: training modules curricula, training materials (e.g., PowerPoints, video lessons, etc.) and logbooks. The development of all of them is presented below, as well as the contribution of the partners.

In addition, the document aims to inform how the pilot sessions were organised, emphasising the importance of having synchronous and asynchronous, theoretical, and practical moments, which are complemented by the support materials mentioned above.

An overview of the partners' contribution to the project is also provided, as well as their contribution to the sample collection. Finally, also concerning this last point, a detailed description of the sample collected by each partner is given.

1.2 Deliverable Structure

The document is organised around 4 main sections:

- Section 1 describes an overview of the project and the purpose of this document.
- Section 2 describes in detail the two main parts, training modules curricula and training modules logbook, that will be addressed in the document, presenting a brief definition of each.
- Section 3 explains how the training materials were developed, as well as their implementation.
- Section 4 describes the development of the forms as well as the sample collection by each partner.

2 Design of training materials

The skill-UP pilot sessions incorporated both asynchronous, which included the visualization of recorded video lessons, later uploaded on the Knowledge Center Platform (WP5), and synchronous moments (e.g., videoconferences or classroom sessions between trainees and trainers). Having both synchronous and asynchronous moments in the skill-UP training allows the trainees to not only access the materials whenever they want, facilitating this conciliation and awakening a sense of curiosity and autonomy, but also to establish a relationship and commitment with their trainer and fellow trainees.

2.1 Operationalization: Synchronous and Asynchronous

The synchronous and asynchronous moments are concepts that are very present in the design of training materials. However, for better comprehension of these concepts, it is necessary to present the definition of e-learning. According to the author Hrastinski (2008), e-learning represents a strong response to the needs of education in the present time, as it is associated with teaching and learning through technological means. Given this definition, we now understand that e-learning is closely associated with the abovementioned concepts.

Starting with the synchronous moments, the same author states that they are present in types of communication such as videoconference and chat, where the trainees develop their learning and interact with the trainers. These moments are important since it helps the trainees to be active participants in their training instead of mere spectators watching a computer, which, consequently, prevents social isolation (Dewey, 1904). This statement is in line with what we want in the skill-UP project training: active participants, who ask questions and develop a learning relationship with their trainer.

Addressing the asynchronous moments, Hrastinski (2008) defines them as a flexible component of e-learning, since they are associated with access to documents or technological platforms from the trainees, at any time. Considering that the trainees have to reconcile their training with work, family or other personal commitments, the asynchronous moments are extremely important since they allow the trainee to manage their training with more flexibility, while also developing autonomy in their learning process (Gursoy & Korkmaz, 2012). Thus, the skill-UP project aims to reach a diverse range of participants, from different countries, different age groups, and different socioeconomic backgrounds. All of the participants will have to deal with coordinating and balancing their work life, personal life and their learning process during their skill-UP training.

As mentioned above the skill-UP asynchronous moments included the visualization of recorded video lessons accompanied by PowerPoint presentations. In the skill-UP project, the usage of asynchronous moments aimed to eliminate geographical barriers and decrease time constraints (Azuka, 2018; Mikalef et al., 2016). Trainees could easily access the information provided at any time of the day and anywhere in the world (Welsh et al., 2003). On the other hand, the usage of PowerPoint presentations in the skill-UP training aimed to facilitate the student's understanding of the learning contents presented and, at the same time, to help the students keep up with the video lessons.

The adoption of technologies (e.g., PowerPoint) in the learning process has been shown to increase motivation to learn (Akhlaghi & Zarein, 2015; Jones, 2003; Lari, 2014). The isolated use of a printed textbook is becoming less optimal in creating learning motivation since a printed narrative is less able to create visual interest. The path in the training field has been towards the implementation of multimedia-based learning, which is focused on creating an attractive appearance through the ability to develop and present visual, audio and animation content for the students (Anwar et al.,

2018). The use of PowerPoint has numerous advantages since capturing trainees' attention to the possibility of using charts, pictures, sounds, films, and animations, to strengthen the material being taught. PowerPoint presentations are considered more attractive because they are not only verbal but also support visualisation (Anwar et al., 2018).

Regarding the development of both materials (i.e., recorded video lessons and PowerPoint presentation), general guidelines were given to maintain the homogeneity between training modules (e.g.: lighting and background in the video but also font type and size in the PowerPoint). At the end of each learning topic of all individual lessons, learning exercises/activities were presented in the PowerPoint to ensure that the content was understood by the trainees. These activities and exercises were included in the Training Module Curricula, presented in the following sections.

3 Design of training modules

3.1 Training Modules Curricula

Due to the development of different training modules with different learning topics, contents and for different professional aviation profiles (Skill-up project, 2022. D3.2. VET Training portfolio test sessions plan), a template named "Training Module Curricula" was developed to collect and compile information about each of the training modules developed and the contents included. For this, it was asked all partners who were training providers to contribute to the "Training Modules Curricula" by developing the following information about their training modules: a brief description of the developed contents, proposed learning exercises (presented at the end of each learning topic in all lessons) and support materials. Furthermore, the "Training Modules Curricula" developed would also allow an overview of the training modules from the trainers' perspective as well as the inclusion of guidelines for replication so that other stakeholders would be able to replicate the training contents and learning exercises, and to facilitate the sustainability of the project.

The "Training Module Curricula" template developed contained the following topics:
- **Training module** - the name of the training module correspondent to the curricula presented
- **Partner responsible** - the name of the partner responsible for the development of the training module
- **Objectives** - what were the goals and objectives of the training module
- **Audience** - to whom would that training module be aimed (e.g., Airport operators, ATCOs, Pilots, RPAS)
- **Duration** - what was the duration of the training module
- **Format** - which would be the format used in the training module (e.g., only asynchronous, only synchronous, both synchronous and asynchronous)
- **Training path** - which was the study pathway that the training module was designed to

Furthermore, the "Training Modules Curricula" had a second section focused on the learning exercises included. This section included the following topics
- **Learning exercises** - the name of the learning exercise
- **Duration** - how long would that exercise take
- **Objectives** - the goals of that learning exercise
- **Type of exercise developed** - presentation and description of the exercise presented
- **Link** (if applicable)
- **Guidance for the correct development with instructions and methodology**
- **Question posted regarding what the trainees should retain from that exercise**

The "Training Module Curricula" is necessary to achieve the goals of the training, providing the duration of the training, making known to the partner what is being done in each module and sharing relevant knowledge and information, justifying the purpose of the contents and exercises, and perpetuating the project in time, leaving positive marks in society (replication guidelines).

In the image below (Figure 1) it's possible to see an example of a blank Training Module Curricula. Furthermore, in the appendix section (Appendixes A - H) it's possible to see all the training modules curricula developed by each training provider.

Training Module:	
Partner Responsible:	
Objectives:	
Audience:	
Duration:	
Format:	
Training Path (S/U/R):	

Lesson 1	
Title	
Objectives	
Main Contents	
Key Messages	
Format	
Duration	
Learning Exercises (name)	

Learning Exercise 1.1	
Title	
Duration	
Objectives	
Type of Exercise	
Link (If applied)	
Guidance for the correct development	
Instructions	
Methodology	
Conclusion: What students should take back from the exercise?	

Figure 1 - Training Modules Curricula Template

4 Implementation of training modules

4.1 Pilot sessions planning

The skill-UP pilot sessions occurred between July and December of 2022, in three modalities: face-to-face (f2f), online totally asynchronous or only with asynchronous and synchronous moments. The table below (Table 1) presents an overview of all training modules implemented with the starting and ending date, the number of participants registered in each training module, the aviation professional profile that the training module has developed for, and the modality in which the training was conducted.

Table 1 - Skill-UP Pilot Sessions Implementation Overview

Training course	From	To	Participants number	Participants profiles	Modality
"Houston, we have a problem": Problem Solving & Decision-making	21/11	12/12	4	Transversal profiles	Online (Synchronus; Asynchronous)
Artificial Intelligence and Machine Learning for Aviation Applications	17/10	04/12	7	Transversal profiles	Online (Asynchronus)
Deepening of Situational Awareness	25/10	12/12	10	Transversal profiles	Online (Synchrouns; Asynchronous)
Strengthening the Psychological Capital	01/11	29/11	45	Transversal profiles	Online (Synchronus; Asynchronous)
Change Management for Automation and Emerging Technologies in Airport Operations	16/01	16/03	9	Airport operators	Online (Synchronus; Asynchronous)
How to cope with Stress and Change to fit in Future Roles	29/09	29/09	11	Air Traffic Controllers	f2f
Learning and Practice of Aircraft Procedures	04/07	4/10	10	Pilots	f2f
Managing My Self: towards a Safer Life	21/11	12/12	6	RPAS operators	Online (Synchronus; Asynchronous)

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4.2 skill-UP Pilot Sessions Sample

For the gathering of participants for the pilot sessions, each training provider had the task of contacting participants for all the skills training modules that would be implemented. In total, 69 participants attended the various training modules developed. It was deemed necessary to analyse and present the sample collected and thus, for the better understanding of the readers, it is important to present the dimensions used to describe the sample of the pilot skills training sessions:

Trainees' age - how old the trainee was when starting the training. For this dimension five classes were created: less than 18 years old, between 18 and 25 years old, between 26 and 35 years old, between 36 and 45 years old and more than 45 years old. Most of the participants (29) were between 26 and 35 years old (Figure 2).

Trainees' Age

Category	Value
Less than 18	1
Between 18 and 25	18
Between 26 and 35	29
Between 36 and 45	16
More than 45	8
N/A	5
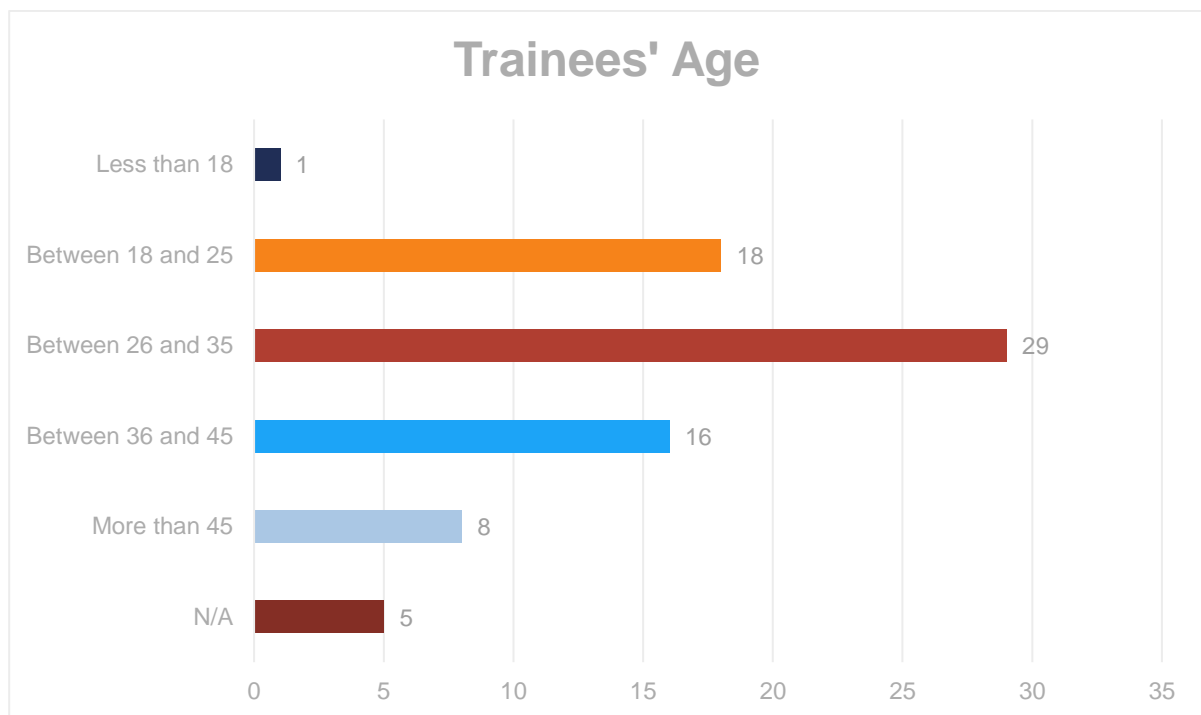
Figure 2 - Participants' Age from the pilot sessions

Trainees' Country - from which country was the participant. The countries with bigger representation were Turkey (33) and France (16), 10 participants were from Italy, 8 from Malta and 6 were from Portugal (Figure 3).
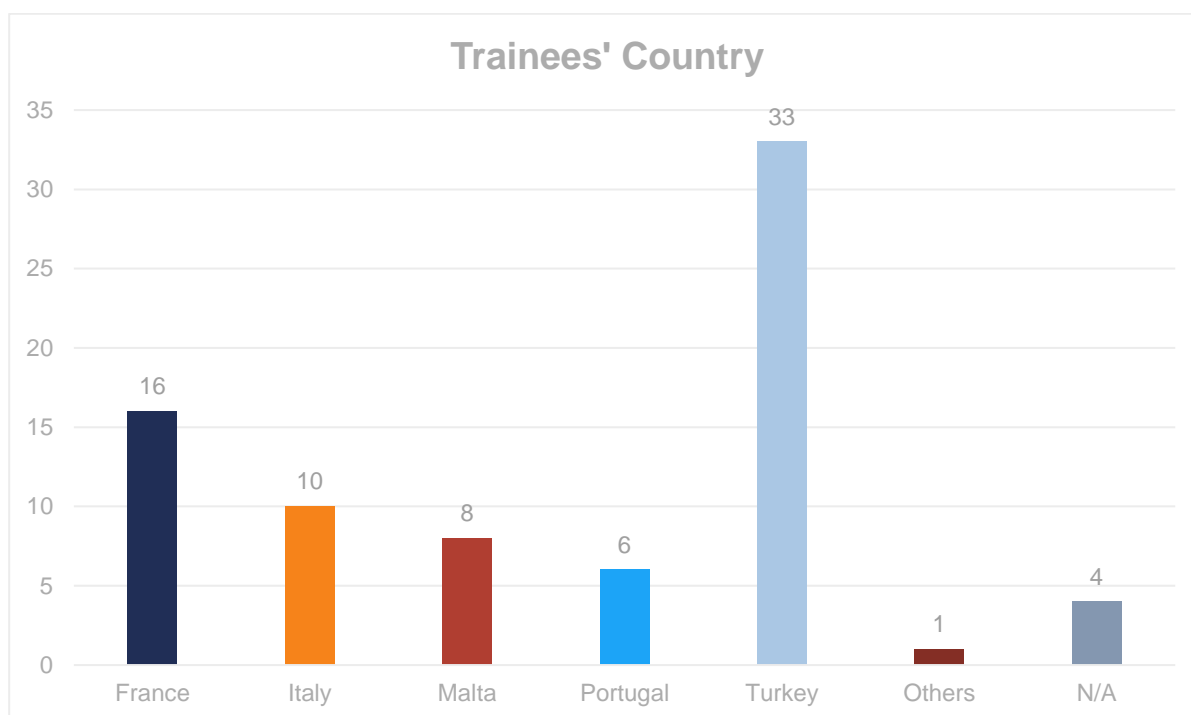
Trainees' Country

Figure 3 - Participants' Country from the pilot sessions

Trainees' occupation - the current occupation of the trainee. In the Skill-up pilot sessions there were 19 Airport Operators, 15 ATCOs, 4 Pilots, 9 RPAS, 6 C-level position professionals, 16 students and 8 trainers/instructors (Figure 4).

Trainees' Occupation
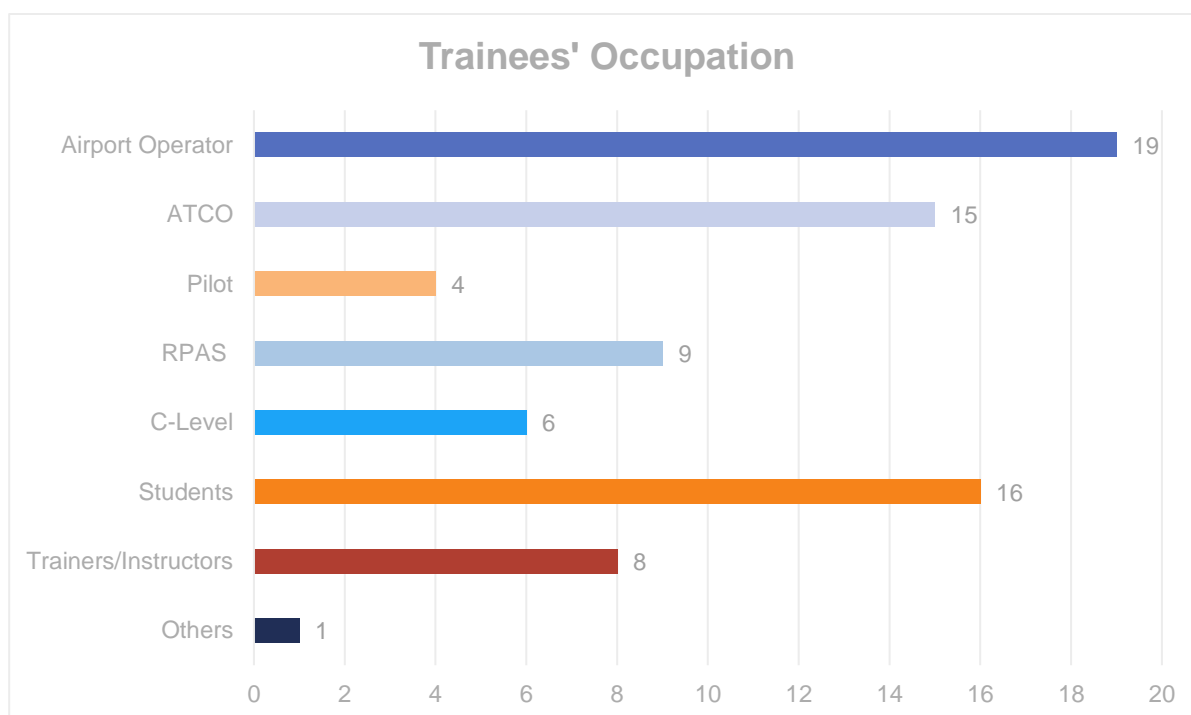
Figure 4 - Participants' Occupation from the pilot sessions

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Years in the occupation - for how long has the trainee been in the current occupation mentioned above. This dimension was divided in four classes where 35 participants were in the current occupation for less than five years, 21 were in that occupation between five and ten years, eight were in the current position between 11 and 20 years and six of the participants were in that current occupation for more than 20 years (Figure 5).

Years in the current occupation

Category	Value
Less than 5	35
Between 5 and 10	21
Between 11 and 20	8
More than 20	6
N/A	8
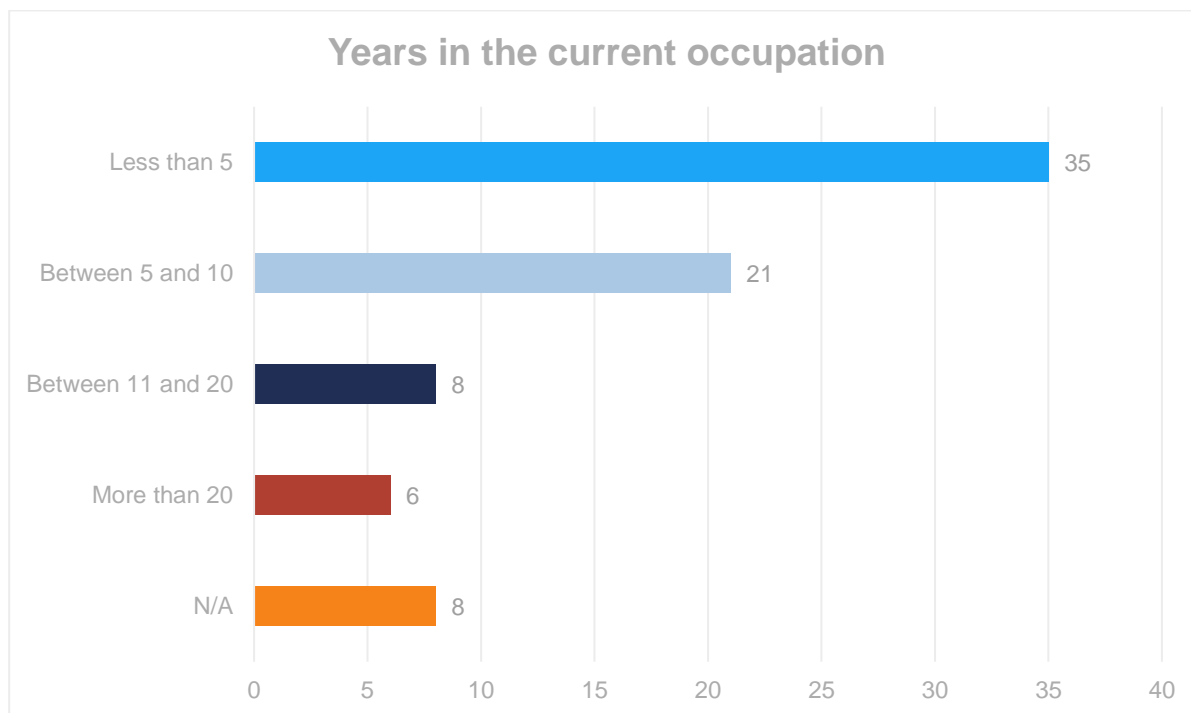
Figure 5 - Participants' years in the current occupation from the pilot sessions

Trainees' Academic level - this section indicates what was the last completed academic level of the trainees. For this purpose, the following dimensions were created: Middle-school, High-school, Undergraduate, Bachelor, Master's, PhD and Others. Most of the participants (33) held a bachelor's degree (Figure 6).

Trainees' Academic Level

Category	Value
Middle school	1
High-school	6
Undergraduate	11
Bachelor	33
Master's	12
PhD	2
Others	9
N/A	4
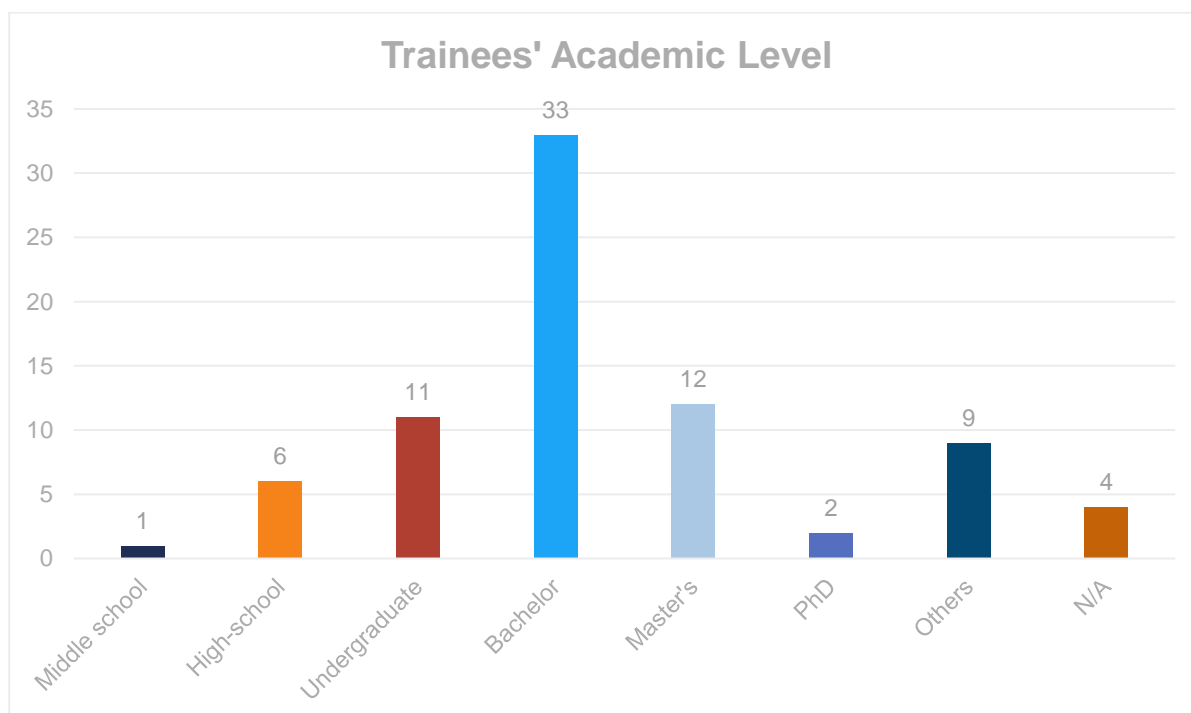
Figure 6 - Participants' Academic level from the pilot sessions

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Trainees' comfort with English - Since all materials for the pilot sessions were in English it was considered necessary to understand the participants' comfort level with the English language. This dimension was measured through a Likert scale from 1 (not comfortable at all) to 5 (completely comfortable). 31 participants stated that they were completely comfortable with English (Figure 7).

Trainees' comfort with English
(1 - not comfortable at all; 5 - completely comfortable)
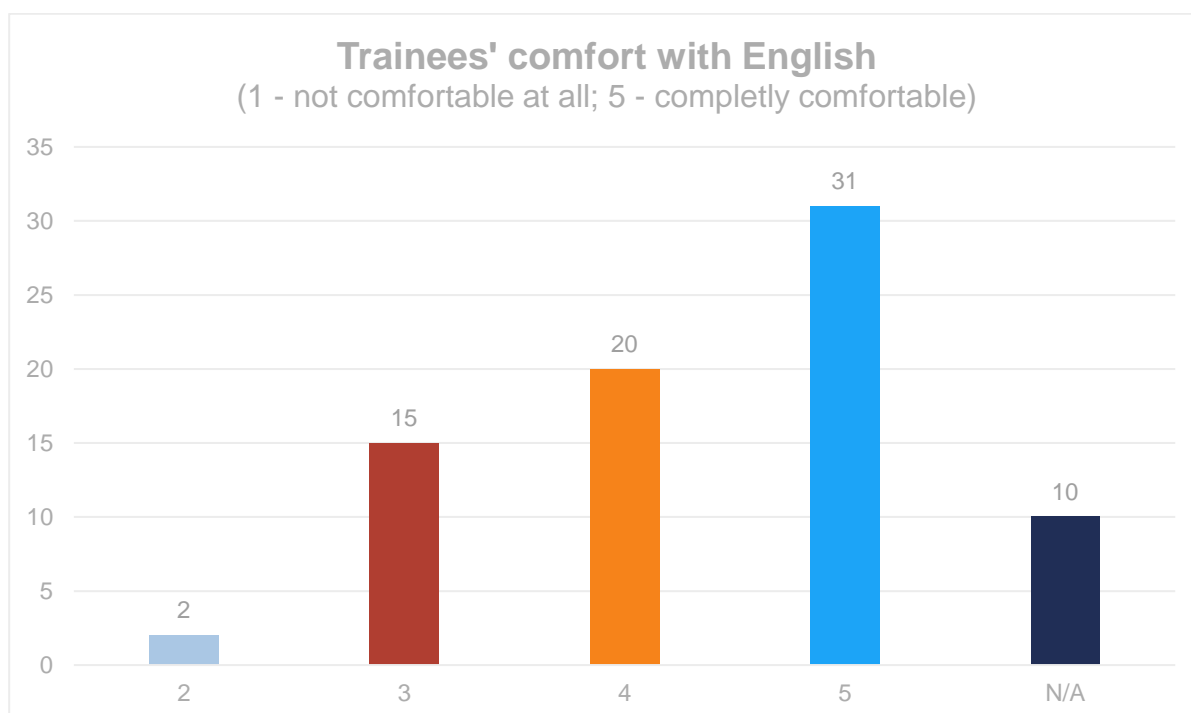
Figure 7 - Participants' comfort with English from the pilot sessions

Moreover, the skill-UP pilot sessions had a total of 69 participants distributed along all the training modules developed.

Finally, in the following sections is presented a description of how each training provider gathered participants for the skill-UP pilot sessions as well as a description of the sample that attended the training module developed by the correspondent partner.

4.2.1 Deep Blue

Deep Blue recruited their participants through ANACNA (Italian National Air Traffic Controllers Association) channels, gathering air traffic controllers from several Italian airports, both strategic and non-strategic. Furthermore, Deep Blue was responsible for the development of the second specific module SM#02 titled "*How to Cope with Stress and Change to Fit in Future Roles Change: Adaptability and Stress Management*".

This training module had a total of 11 participants and all of them were ATCOs. Most of the participants (8) were in the current position ranging between 5 and 10 years, one participant was in the current position for more than 10 years and two of them were in that position for more than 20 years (Figure 8).

Years in the current position

Category	Value
Between 5 and 10	8
Between 11 and 20	1
More than 20	2
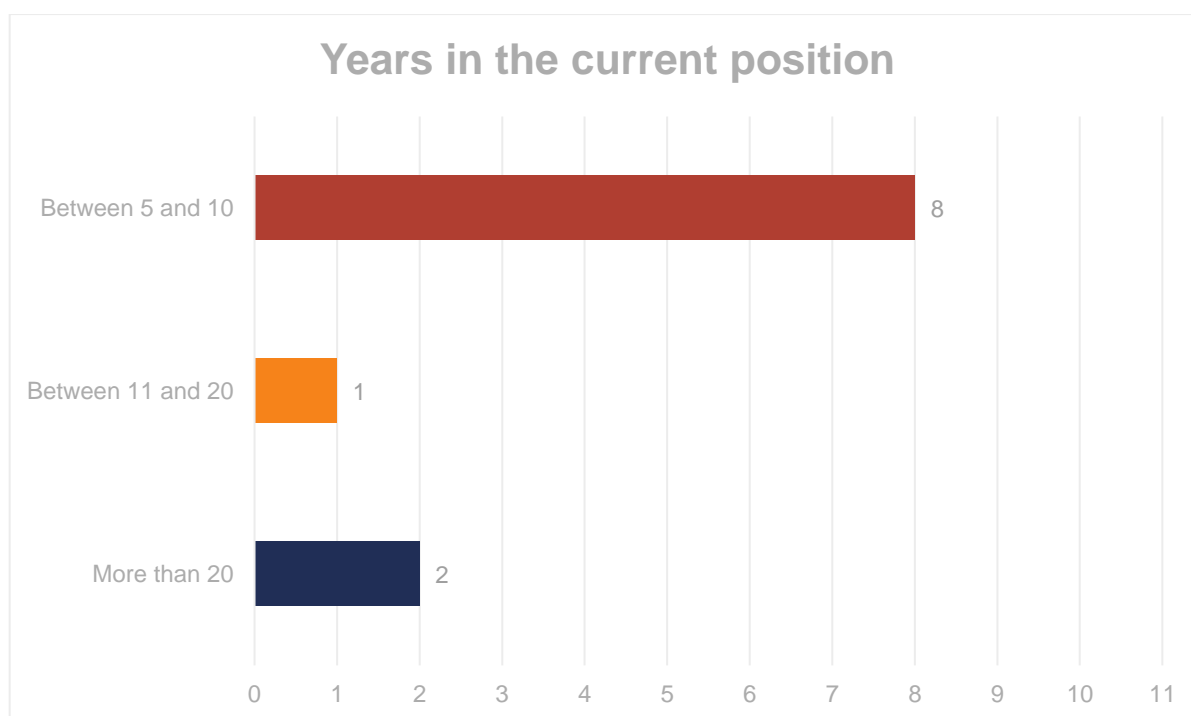
Figure 8 - Graphic with the years in the current occupation of the SM#02 trainees

Six participants were aged between 26 and 35 years old, four of them were between 36 and 45 and one had more than 45 years old. Regarding the participants' academic level, three participants were high-school graduates, one participant had a bachelor's degree and four had completed a master's degree. Most participants (10) were from Italy with one being from Malta. Finally, all participants stated that they were completely comfortable with English on a scale from one (not comfortable at all) to five (completely comfortable). In the appendix section (appendix I) are presented the graphics that were developed, regarding the above-mentioned information.

4.2.2 ENAC

ENAC recruited their participants through their network: pilot students, pilot instructors, ATC instructors, airline pilots and UAV pilots. ENAC was also responsible for the development of two training modules, the third transversal module (TM#03) entitled "*Deepening of Situation Awareness*" and the third specific module (SM#03) entitled "*Learning and Practice of New Aircraft Procedures*".

The training module "*Deepening of Situation Awareness*" had a total of 10 participants, with half of the participants being more than 45 years old. Most of the participants (7) were trainers/instructors and 3 were RPAS (Figure 9).
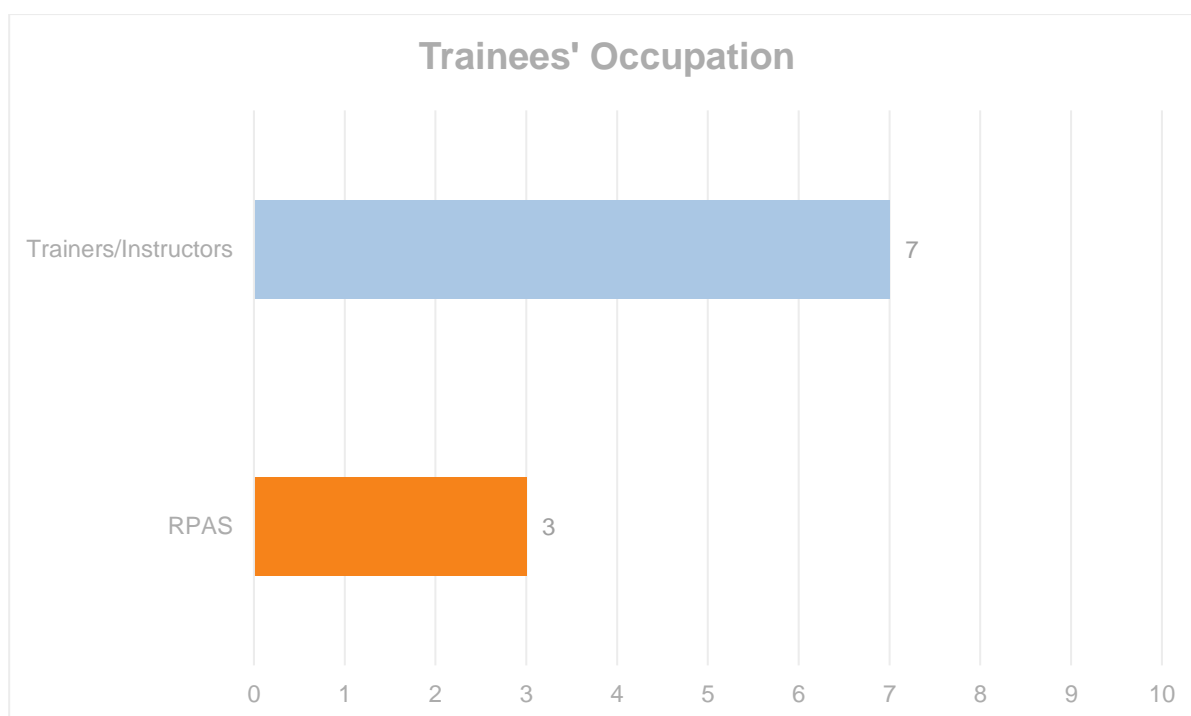
Figure 9 - Graphic with the occupation of the TM#03 trainees

Also, 3 of the participants were in their current position from more than 20 years. 6 of the participants were from France and most of the participants were comfortable with English. In the appendix section (appendix J) are presented the graphics that were developed, regarding the above-mentioned information.

Regarding the participants of the "*Learning and Practice of New Aircraft Procedures*", they were 10 pilot students that were recruited by the major French Airline and are trained by ENAC. At the time of the pilot sessions, they were preparing the ATPL theoretical certificates at ENAC. Most of them (6) were between 26 and 35 years old and 4 were between 18 and 25 years old (Figure 10). All of the participants were from France and were undergraduates. Three of the participants stated that they were comfortable with English.
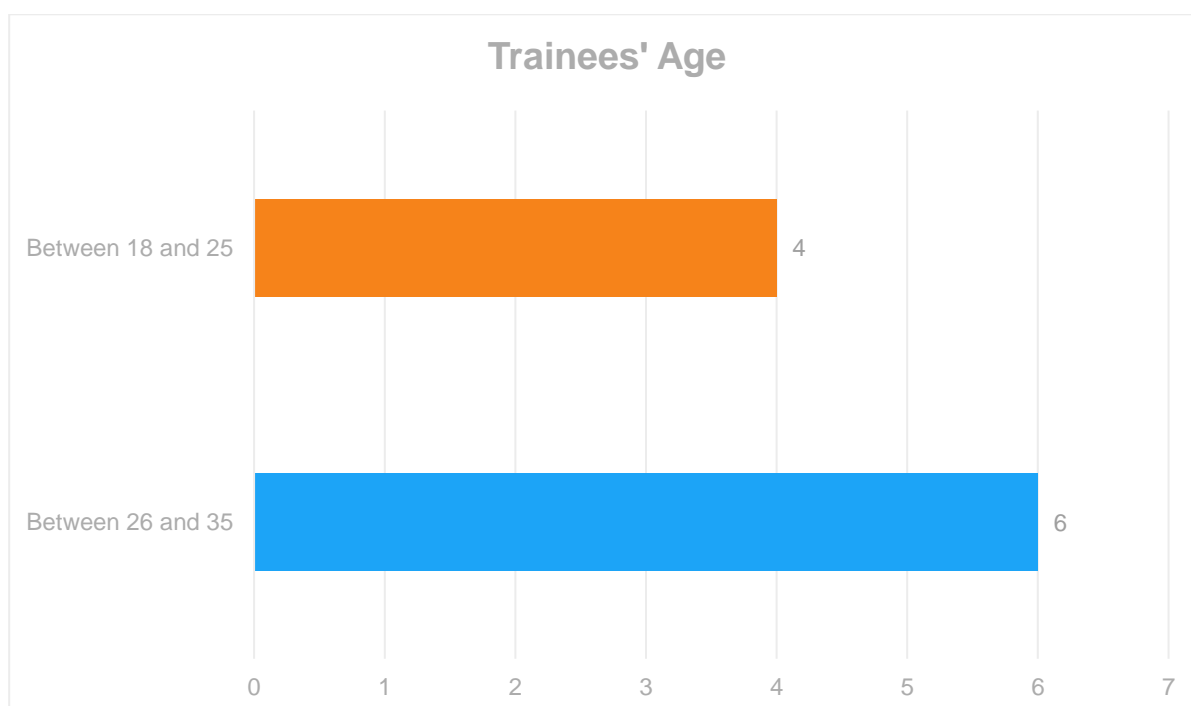
Figure 10 - Graphic with the age of the SM #03 trainees

4.2.3 Eskisehir Technical University

For this training module, which concerns airport operators, the training was disseminated trough the Fraport-TAV, the network of the project team and the aviation association "Aviation for All" operating in Turkey. Online meetings were organized to introduce the project and invite interested parties to participate. The participants were later informed about the project and the training module via e-mail. In addition, an announcement was made about the promotion of the project and training on the LinkedIn page of the association.

Although more participants were invited, 9 participants attended the training. Six of the participants were airport operators and three were students that were participating in internships. The participants had between 1 and 10 years of experience. Furthermore, the different levels of experience were considered, this is that some participants had only started working in their current occupation and had little experience when compared with more experienced participants. The age of the participants varied between 18 and 32 years old (Figure 11).
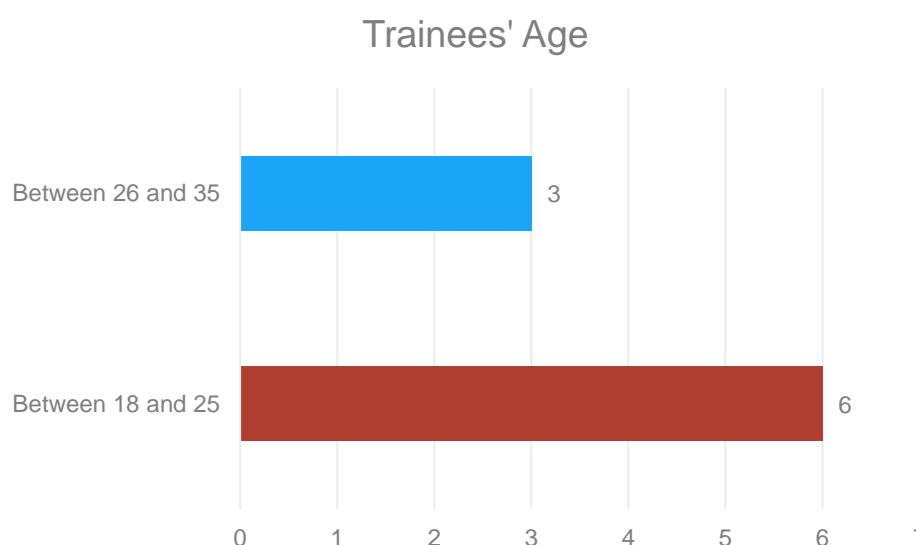
Trainees' Age

Figure 11 - Graphic with trainees' age of the SM#01

Moreover, participants stated that, on a scale from 1 (not comfortable at all) to 5 (completely comfortable), their English levels varied between 3 (2 participants) and 4 (7 participants). All participants were from Turkey with Turkish nationality. One of the participants was an undergraduate and the other six participants had bachelor's degrees. All participants received training in aviation-related departments. In the appendix section (appendix K) are presented the graphics that were developed, regarding the above-mentioned information.

4.2.4 Kastamonu University

Kastamonu University gathered participants through career websites like LinkedIn and its Turkish equivalences. Additionally, the professional networks of the project team members from Kastamonu University were used, as well as stakeholders and co-workers of Kastamonu University - School of Civil Aviation were also invited to this transversal module. Kastamonu University was also responsible for the development of the fourth transversal module (TM#04) entitled "*Strengthening Psychological Capital*".

This training module had a total of 45 participants, most of them between 26 and 35 years old (11). Regarding the occupation of the trainees, most of them have been in their occupation for less than 5 years (10) and most of them were Airport operators (13), followed by RPAS (5), ATCOs (4) and Pilots (2). Most of the trainees had bachelor's degrees (18) and all of them were from Turkey. Finally, regarding the level of English, only two trainees responded that they were not comfortable with English, while the rest could understand the language (Figure 12).

Comfort with English
(1 - not comfortable at all; 5 - completly comfortable)
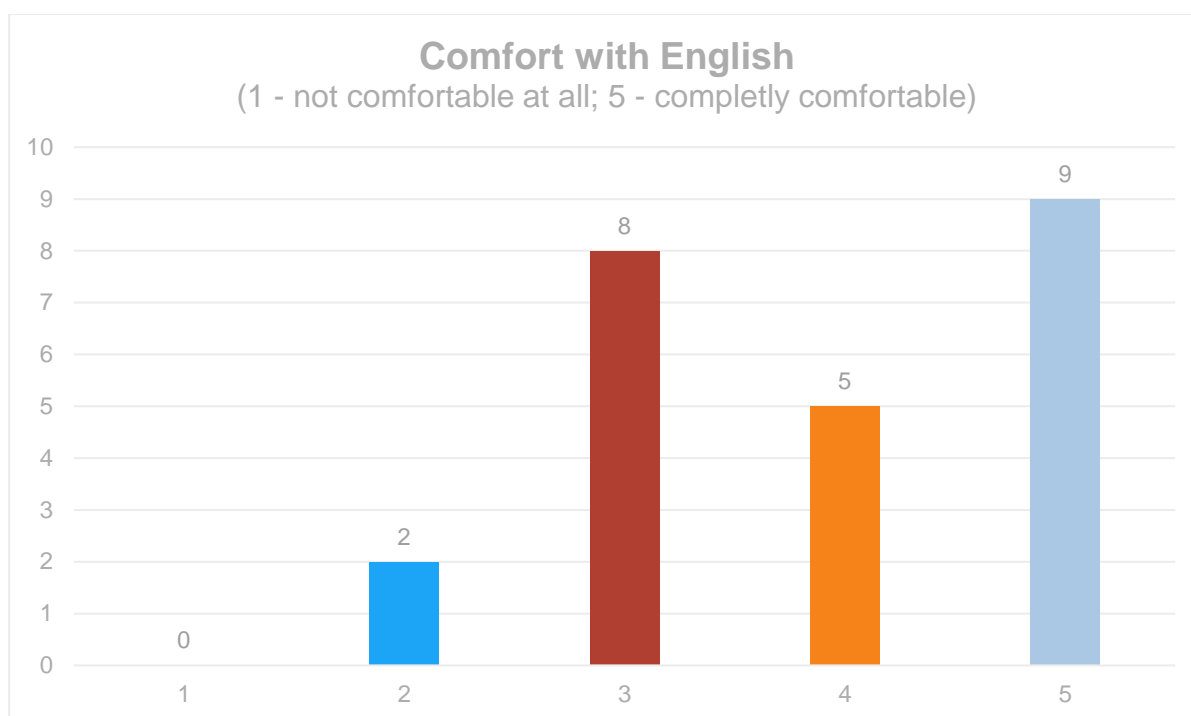
Figure 12 - Graphic with the level of comfort with English of the TM#04 trainees

In the appendix section (appendix L) are presented the graphics that were developed, regarding the above-mentioned information.

4.2.5 QSR

QSR recruited their participants through e-mails to their networks as well as social media post on LinkedIn. Furthermore, the Portugal Air Summit event (a national aeronautical summit) allowed the contact with a wider network to collect more participants. QSR was also responsible for the development of two training modules, the first transversal module (TM#01) entitled "*Houston, we have a problem: Problem-solving & Decision-making"* and the fourth specific module (SM#04) entitled "*Managing myself: towards a safer life – Workload Management & Stress Management*".

"*Houston, we have a problem: Problem-solving & Decision-making*" training module gathered a total of 4 participants, two of them were between the ages of 26 and 35, one was between 18 and 25 and another one had more than 45 years old (Figure 13).
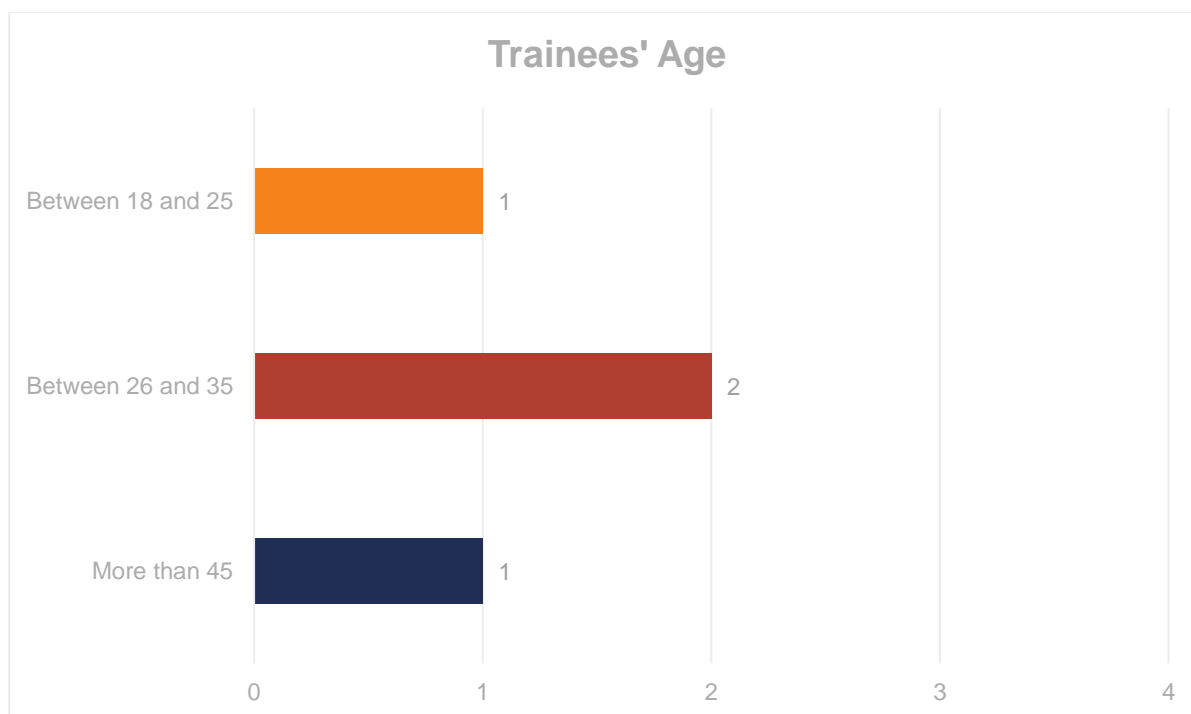
Figure 13 - Graphic with the age of the TM #01 trainees

All the participants were from Portugal. Most trainees (3) were C-Levels in aviation sector companies, however, two of the participants were in their current position for less than 5 years. Finally, through the analysis of the attached charts, it is possible to see that most of the participants (3) felt quite comfortable with the English language. In the appendix section (appendix M) are presented the graphics that were developed, regarding the above-mentioned information.

The training module "*Managing myself: towards a safer life - Workload Management & Stress Management*" had a total of 6 participants. Two trainees were between 26 and 35 years old, two of them were between 36 and 45 years old, one was between 18 and 25 years old and one of them had more than 45 years old. Most of the trainees (4) have been in their occupation for less than 5 years, and most of them (5) are C-levels in aviation sector companies (Figure 14).
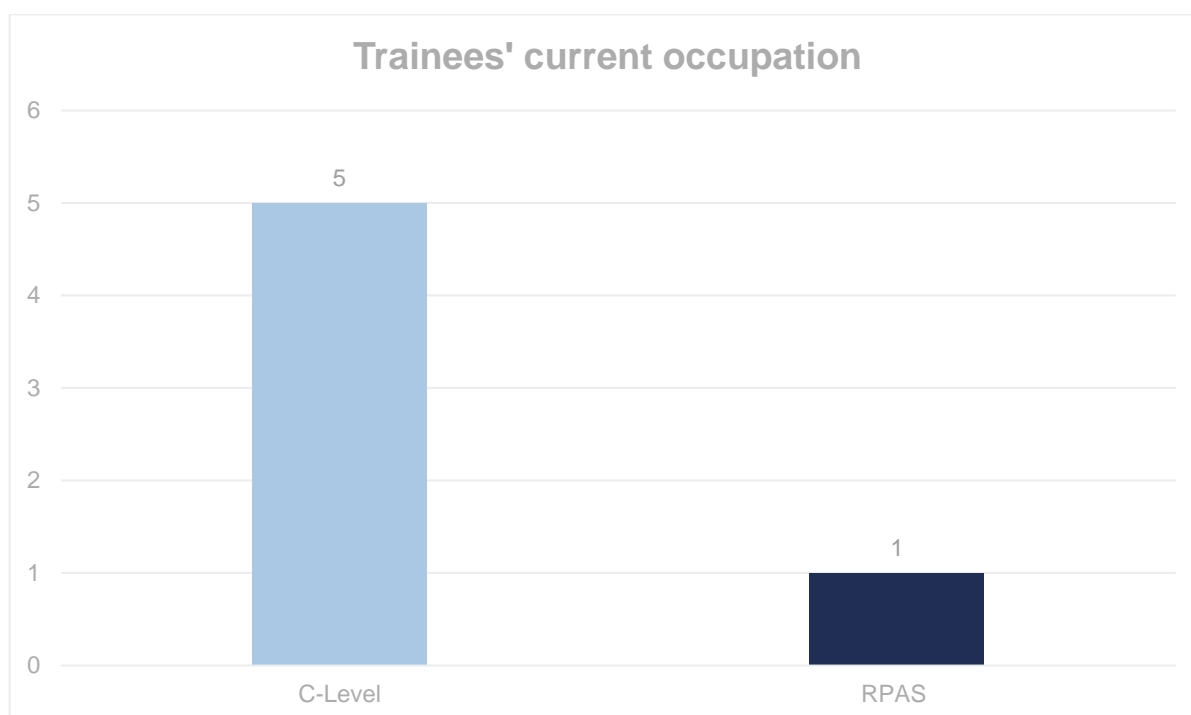
Figure 14 - Graphic with the current occupation of the SM#04 trainees

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Regarding their academic level, 3 participants had a master's degree, one had a bachelor and one of them had a PhD. All of the participants were from Portugal and most of them (3) were completely comfortable with English with only one participant selecting level 3 (on a scale from 1 to 5) for their comfort level. In the appendix section (appendix N) are presented the graphics that were developed, regarding the above-mentioned information.

4.2.6 University of Malta

University of Malta recruited their participants using two methods: (a) by sending emails to individuals and organisations within the aviation community (such as Air Malta and Malta Air Traffic Services ltd) and (b) by advertising the module of the University of Malta on the social media networks such as Facebook, Instagram, and LinkedIn. University of Malta was also responsible for the development of the second transversal module (TM#02) entitled "*Artificial Intelligence and Machine Learning for aviation applications*".

This training module had a total of 8 participants, in which most were between the ages of 36 and 45 (4). 3 participants were students, 2 were pilots, one was a trainer/instructor and another one had a c-level position. 3 of the participants were also in the current position for less than 5 years. 3 participants had a masters' degree, 2 had a bachelor's degree and one had a PhD (Figure 15).
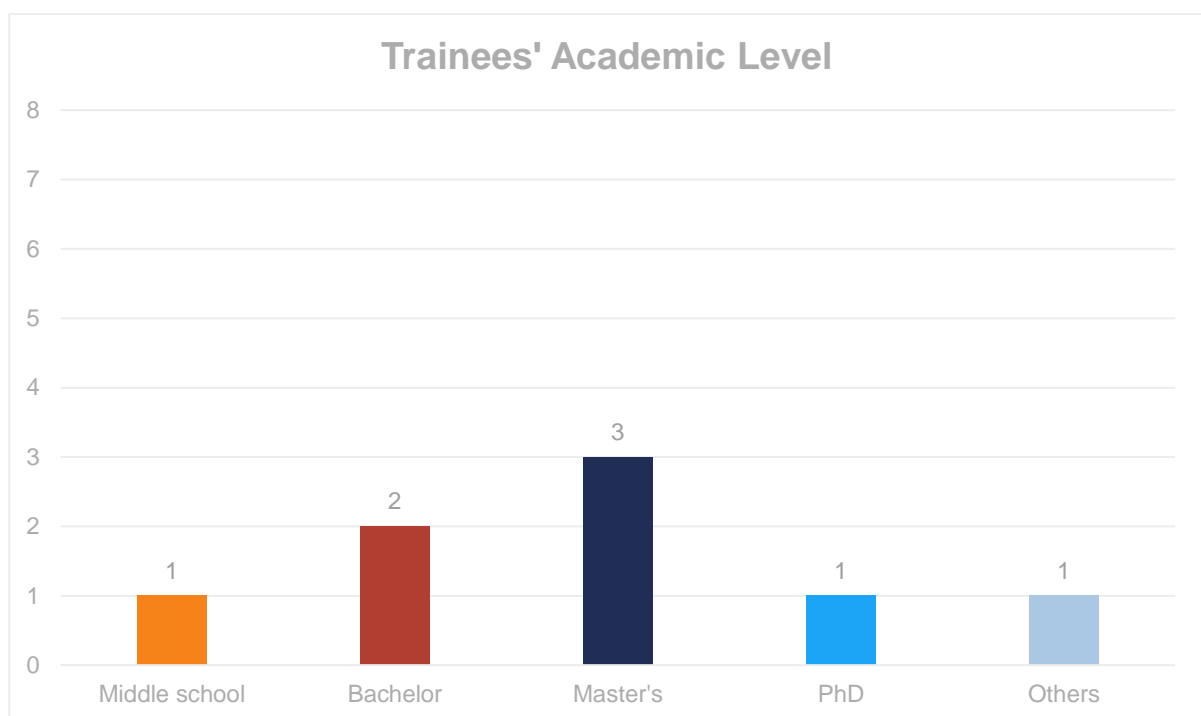
Figure 15 - Graphic with the academic level of the TM#02 trainees

Most of the participants (7) were from Malta. Finally, all the participants stated that they were completely comfortable with English. In the appendix section (appendix O) are presented the graphics that were developed, regarding the above-mentioned information.

4.3 Knowledge Centre Platform

The Knowledge Centre Platform is a web-based learning platform developed by the skill-UP project in WP5. This platform was launched and tested during the pilot sessions implementation. The contents developed during WP3 as well as the assessments developed in WP4 were adapted to e-learning formats and implemented in the Knowledge Centre Platform (Skill-up project, 2022. D2.1 From theory to practice: understanding user profiles and training needs; Skill-Up Project, 2022. D2.2 Study Pathways: Skilling, Upskilling and Reskilling).

4.4 Synchronous Moments Implementation

The "Trainers' Logbook" was a tool developed for trainers to use at the end of their synchronous lessons, to reflect on each synchronous moment individually and, at the end of the training, on the synchronous moments. This tool was used as a way for monitoring the synchronous sessions so that aspects that went better or worse could be pointed out, as well as trainees' difficulties, to later be used to improve the content of the training modules curricula.

Therefore, the "Trainers' Logbook" was divided into two parts: 1) "**Trainer's Diary**" and 2) "**Final Reflection**". The "Trainers' Diary" would help trainers keep track of their feedback and observations regarding each synchronous moment. It was asked that all training providers filled in one "Trainer's Diary" at the end of each synchronous moment. Therefore, training modules that would have one synchronous moment would only have one "Trainer's Diary", and so on. The "Trainer's Diary" would also help the trainer in their "Final Reflection" by working as a written record of all the past synchronous moments that trainers could go back to and reflect on.

To use this "Diary", each trainer should, at the end of every synchronous moment, answer three questions within the Logbook: 1) "Was this activity successful? Why or why not?"; 2) "Were my students invested? If not, how could I encourage their commitment?"; 3) "Next class, what can I do differently to improve?".

The "Final Reflection" is a final question that aimed to help trainers reflect on the synchronous moments of their training module. It asked all trainers to reflect on their training module, specifically on their synchronous moments. (e.g., "what could have been better?", "how they could've overcome the challenges felt?", etc.). In the "Final Reflection" some questions were given as suggestions to help trainers reflect, however, trainers could approach any topic they wanted.

Moreover, the Logbook was a tool that aimed to help trainers reflect on the synchronous moments of their training module. However, not all training modules in the skill-UP pilot sessions included synchronous moments like the second specific training module developed by University of Malta ("*AI and ML for Aviation Applications*"). Therefore, the Logbooks presented in the appendix section are the ones developed by trainers who had synchronous moments. Furthermore, it was considered necessary to have a reflection of the pilot sessions by all training providers. This reflection, developed by trainers on the overall implementation of their respective training modules (including asynchronous and synchronous moments) is presented in the next section (4.3. Overall Implementation) all training providers.

Lastly, in the figure below (Figure 16) the Trainers' Logbook (blank) developed is presented.

a. Trainers' Diary (per synchronous lesson)

Was this activity successful? Why or why not?

Were my students invested? If not, how can I encourage their commitment?

Next class, what can I do differently to improve?

b. Final Reflection

Now that you reached the end, please reflect on your training module delivery and implementation.

Some suggestions:
- What went well?
- What could've been better?
- What could you have done to overcome any challenge that you've felt?

Figure 16 - skill-UP Logbook Template

4.4.1 Training Modules' Logbooks

4.4.1.1 TM #01 - "Houston, we have a problem: Problem-solving & Decision-making"

In the training module of "Houston, we have a problem: Problem-solving & Decision-making" two participants were present. Suggestions for the soft skills training were given. More specifically, suggestions to help the participants think of soft skills components to solve the problem: "To try to direct the thinking more towards soft skills." The logbooks for this training module is presented in the appendix section (appendix P).

4.4.1.2 TM #03 - Deepening of Situation Awareness

In the training module "Deepening of Situation Awareness" suggestions were made about the contents to be shared before the synchronous moments, highlighting the assessment tools, so that the trainees could better understand the respective tool. Suggestions were also given about possible examples to share in the moments: "Maybe I could send the self-assessment tool before the synchronous session to let more time for the students to familiarize themselves with the tool".

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The logbooks for this training module is presented in the appendix section (appendix Q).

4.4.1.3 TM #04 – Strengthening Psychological Capital

In the training module of "Strengthening Psychological Capital", suggestions were given for improving the synchronous moments to be more beneficial and interesting for the trainees: "Having students give their opinion on the topic would have made the class more exciting and beneficial for the students". Furthermore, suggestions were also given about interactive exercises for the synchronous moments, such as case studies: "In my experience from this pilot session, I believe that the more case studies and the attendance of students will improve the quality of learning".

The logbooks for this training module is presented in the appendix section (appendix R).

4.4.1.4 SM#01 – Change Management for Automation and Emerging Technologies

There were six participants in the synchronous moments of the training module. It was stated that interaction with the trainer in synchronous lessons made the training more efficient. Furthermore, the synchronous moments of this training module were used to discuss the case study developed.

During these moments, participants stated and realized that even more topics addressed in the training module were compatible with the problems they face in their workplace. However, participants also stated that it was also difficult to create time in the environment in which they worked to attend training.

The logbooks for this training module is presented in the appendix section (appendix S)

4.4.1.5 SM #02 - How to Cope with Stress and Change to Fit in Future Roles Change: Adaptability and Stress Management

In the training module "How to cope with stress and change to fit in future roles", suggestions were made related to the extension of synchronous moments and the coherence between the contents and the context of the participant's profession: "Mapping contents and making them more coherent with ATCOs' operational environment; Spread the training course on 2 days". There was also a lot of connection between the trainers and the trainees: "Interaction with the trainees; Active engagement with the trainees". The logbooks for this training module is presented in the appendix section (appendix T).

4.4.1.6 SM #03 – Learning and Practice of New Aircraft Procedures

The training module, "Learning and Practice of New aircraft Procedures", was aimed at learning a virtual reality tool. Therefore, the suggestions given for the synchronous moments were related to this tool. More specifically, instructions and more information about this tool: "One drawback of the virtual reality device is its high sensitivity to the interaction with the student's hands. Consequently, sometimes the device counts an action as an error whereas the student did the correct action. The virtual reality tool could probably be modified in that way to have fewer "false" errors". The logbooks for this training module is presented in the appendix section (appendix U).

4.4.1.7 SM #04 - "Managing myself: towards a safer life": Workload Management & Stress Management

In the training module "Managing myself: Towards a safer life: Workload Management & Stress Management", only one participant was present. Suggestions were made for the synchronous moments, related to the participant's thinking process. That is, to help the participant understand that his thinking is unique and that there are no right or wrong answers: "Always guide the trainee in such a way that he realizes that his thinking is unique, it is always going to be different from others, and that doesn't mean that it is incorrect". The logbooks for this training module is presented in the appendix section (appendix V).

4.5 Pilot sessions implementation

In the following section, the training providers were asked to reflect on how the training delivery went. Below all the reflections are presented.

4.5.1 TM #01 - "Houston, we have a problem: Problem-solving & Decision-making"

The "Houston, we have a problem: Problem-solving & Decision-making" module was provided in synchronous and asynchronous moments. To increase the presence of the participants, some emails were sent with the respective dates of the sessions and their purpose: reflective moments of sharing that could help direct the way of thinking of the trainees.

In the synchronous moments, information was given about some issues in the platform. Our trainees couldn´t participate and watch the videos about the training modules. Therefore, this factor impacted the asynchronous moments since it was much more difficult for the trainees to take advantage of the training modules.

Overall, 23 people showed interest in participating in the training module. However, the training module had little adherence compared to these numbers and even less adherence in the synchronous moments. This may indicate that people might not be as available for the synchronous training as they would be if the modules were fully asynchronous.

4.5.2 TM #02 - Artificial Intelligence and Machine Learning for aviation applications

The training module was provided in an entirely asynchronous manner. To increase the presence of the instructor (tutor), announcements were sent to the participants at the beginning of each lesson, as well as halfway through each lesson (in the middle of the week). These announcements helped the students to keep on track and to know exactly what was expected of them in each lesson. Furthermore, the tutor monitored the online forums - as well as the students' activity statistics (percentage of video lessons viewed, etc.) - regularly. Finally, the tutor also graded the students' assignments and provided feedback whenever necessary.

Overall, the delivery of the training module went quite well. There were some hiccups in the first lesson due to technical issues with the online learning platform; however, most of these issues were eventually resolved and the students seemed to become familiar with the learning platform. The majority of the students watched all of the video lessons provided and all of them completed the pre-assessment questionnaires. A few students also completed the majority of the assignments (including the drag-and-drop exercises and the final test case study); however, student participation in the three online discussion forums was lower than expected, partly due to technical issues with the 'Forum' feature of the learning platform. So far, one of the students has completed the multiple-choice test and the post-assessment questionnaires. The focus group of the training module has not yet been carried out; however, the feedback that has been obtained so far has been encouraging.

4.5.3 TM #03 - Deepening of Situation Awareness

Concerning the synchronous sessions of the "Deepening of Situation Awareness" module, several sessions were organised to adapt to all the trainees' constraints (both in classrooms and via Zoom or Teams). Participants were globally satisfied. The first synchronous session was successful as it was the first-time students could interact directly with the trainer after 5 asynchronous sessions. The presentation of the example of a self-assessment tool used in a former study has been greatly appreciated as the trainees felt they could have a concrete tool to use after the training. The students were invested as it was a short session based mostly on the discussion about a tool they could imagine using in operational contexts. The second synchronous session was essentially used to organise the focus group to gather qualitative feedback from the trainees. Indeed, most participants were instructors and did not have the time to test the self-assessment grid of their

situation awareness in operational contexts (as it was originally designed). However, they imagined what could have effects on future trainees.

4.5.4 TM #04 – Strengthening Psychological Capital

Regarding the training module "Strengthening Psychological Capital", the participants found the module exciting and helpful in their career life. It is safe to say the participants were satisfied overall. Regarding points for improvement, the Knowledge Centre Platform used for the modules could've been more user-friendly. It needs improvement as the trainers faced issues regarding uploaded videos in the system. However, it was a satisfying pilot implementation.

4.5.5 SM #01 - Change Management for Automation and Emerging Technologies

The "Change Management for Automation and Emerging Technologies" module was provided with synchronous and asynchronous moments. Participants were given information about the training process, how to use the training platform, how to make synchronous lessons, and the whole process. Synchronous lectures were held in a separate video conference environment by determining the common suitable times for the participants.

During the synchronous lessons, students were asked questions and a short case study was solved. As it was seen that the participants did not participate in the exercises, it was sent separately via e-mail. However, they were not very willing to do the exercises. While they made multiple choice questions more willingly, they were more reluctant in essay questions.

Furthermore, participants stated that online training for aviation employees is more efficient, so this training was beneficial for them. They stated that instead of synchronous lessons, asynchronous lessons can be more productive for them, considering their intense working environment.

4.5.6 SM #02 - How to Cope with Stress and Change to Fit in Future Roles Change: Adaptability and Stress Management

The whole module followed a synchronous delivery to all the 11 ATCOs involved in the training. One aspect that particularly engaged the audience was holding the training close to the first Italian Digital Tower in Brindisi. This way, all the participants have been able to understand the major changes that this kind of technology can bring to their work. In the training highlights, we can report an active engagement of the participants, thanks to the interactive tools and questions used in the training delivery. In particular, both the trainers and the trainees found helpful the social dinner held the day before the training: this way, a more informal way to collect needs and initial feedback about stress and change management from the involved ATCOs. Moreover, the trainers have been able to collect inputs used the following day as examples to introduce new topics of the training. On the other hand, some things could have been handled differently. The exercises could have been more structured: sometimes the ATCOs were not able to understand their task, resulting in a loss of time and important content. Moreover, some participants reported that, even if the training has been considered helpful for topics introduced, they would have liked having training more focused on the stressors elicited specifically from the switch towards a Digital Tower.

4.5.7 SM #03 – Learning and Practice of New Aircraft Procedures

The synchronous session of the "Learning and Practice of New Aircraft Procedures" corresponded to the learning and practice with the virtual reality tool. Each student had to learn and practice autonomously the aircraft procedure. The trainer and the virtual-reality expert were present to answer specific questions and in case of technical issues with the training device. This activity was globally successful. The students enjoyed learning the procedure this way. They said it was amusing and they enjoyed being immersed in a virtual A320 cockpit. The students were invested. They also felt challenged by the feedback given at the end of each run of the procedure (time spent and the number of errors). One drawback of the virtual reality device is its high sensitivity to the interaction with the student's hands. Consequently, sometimes the device counts an action as an

error whereas the student executed the correct action. The virtual reality tool could probably be modified in that way to have fewer "false" errors. Globally, the training module reached its objectives. Some additional instructions in the use of the virtual reality tool should be provided, as many students committed the same errors (e.g., indicating more clearly that the student has to touch the title of the procedure to start the recording of their interactions with the device and get feedback at the end).

4.5.8 SM #04 - "Managing myself: towards a safer life": Workload Management & Stress Management

This training was provided synchronously and asynchronously. The dates of the sessions and their intended purpose—reflective moments of sharing that may guide the trainees' thinking—were provided in some emails as gentle reminders to promote participation.

Information was supplied concerning a few platform concerns during the synchronous times. The videos concerning the training modules could not be viewed or participated in by our trainees. Since it was significantly harder for the trainees to utilize the training modules, this component certainly influenced the asynchronous moments.

In all, 9 people expressed interest in attending the training module. In contrast to these figures, the training module had a low level of adherence and even lower levels in synchronous moments. This might mean that participants are less likely to be available for the synchronous moments than they would be if they were entirely asynchronous.

5 Conclusion

Deliverable 3.3 VET Training Design and Implementation of the training modules allowed an understanding of the development and design of the training materials, with a focus on the training modules' implementation. With the training modules curricula developed it was possible to

understand the contents of each training module as well as give guidelines for implementation by other stakeholders.

Furthermore, the Trainer's Logbook developed allowed the training providers to reflect on the synchronous moments. In general, although some issues were encountered during the implementation of the pilot sessions, the training providers stated that the training modules and their implementation were successful.

The participants were able to benefit from the training sessions, and it was indicated that having a time to ask questions and clarify ideas was very positive. In addition, the fact that the training sessions contained concrete exercises and real examples allowed them to better understand the contents taught.

6 Next steps

In Deliverable 4.2 (VET Training Results Report, due at M38) the results regarding the assessments implemented during the pilot sessions will be presented. These results will allow for a more in-depth understanding of the pilot sessions' success from a participants' perspective, including analysis regarding participants' entry-level skills, progression and knowledge and skill retention after training. Furthermore, analysis regarding participants' expectations and experiences, as well as motivation and satisfaction will also be included.

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8 Appendixes

8.1 Appendix A – Training Modules Curricula "Houston, we have a problem: Problem-solving & Decision-making"

Training Module:	Houston, we have a problem!: Problem-solving and decision-making
Partner Responsible:	QSR
Objectives:	• Understand how problem solving and decision making interrelate • Understand different strategies of problem solving and decision-making • Apply in daily life problem solving and decision-making tools
Audience:	RPAS pilots, Pilots, ATCO, Airport Operators
Duration:	6h (sync/assync) + 19h (self-study) + 1h post-training assessment
Format:	Synchronous moments (this is, video conference lessons with a trainer) to stimulate communication among participants Asynchronous moments (self-learning with a set of support materials) to allow the completion of the course at one's pace Practical case studies throughout the course
Training Path (S/U/R):	Skilling and Upskilling

Lesson 1	
Title	Problem solving and decision-making, aren't they same?
Objectives	Understanding the concepts of problem solving and decision-making and how they differ but also interrelate
Main Contents	• Introduction to problem-solving and decision-making concepts • System 1 and System 2
Key Messages	• Understand the what is problem-solving and decision-making • Understand why problem-solving and decision-making are different; • Understand the connection between stress management and time/tasks management;
Format	100% Asynchronous
Duration	45 min (Asynchronous Video Lesson) + 6,33H (Homework)
Learning Exercises (name)	L1.1: Time to recall L1.2: Knowing myself;

Learning Exercise 1.1	
Title	Time to recall
Duration	10 minutes
Objectives	• Recall the concepts of System 1 and System 2 • Understand that it's not possible to think rationally all the time • Understand the difference between system 1 and system 2
Type of Exercise	Self-reflection / Individual
Link (if applied)	N/A
Guidance for the correct development	
Instructions	• Taking all this into account, do you think it's possible to think 100% rationally?
Methodology	Synchronous Session • Present the exercise • Give trainees time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise Asynchronous Session • In a word document present the exercise • Ask trainees to reflect on the same document and in the end read the conclusions • Trainees must upload their reflection on the platform
Conclusion: What trainees should take back from the exercise?	Solving problems or taking decisions are the result of our minds invisible work, usually called, thinking. Although thinking is a process we do every day all time, science still struggles to understand it. 95% of our thinking process is done in System 1, which is responsible for our fast thinking. This type of thinking process is fast, difficult to control or modify, implicit and doesn't require self-awareness. For this we can't say that our thinking process is 100% logical and self-aware, since this type of thinking is done in System 2, which is responsible for only 2% of our thinking process.

Learning Exercise 1.2	
Title	Knowing myself
Duration	30 minutes

Objectives	- Understand what involves the, sometimes unconscious, processes of problem-solving and decision-making - Relate with real-life events
Type of Exercise	Self-reflection / Individual
Link (if applied)	N/A
Guidance for the correct development	
Instructions	Remember a recent problem you need to solve in work. Ask yourself: - Which steps did I take? - Did I apply any strategy? If so, describe it. - What went well? - What could have been better? Now let's do the same for decision-making process. Remember a recent decision you had to make in your work or your personal life, besides the day-to-day decisions you have to make, like deciding what to have for dinner. Then, ask yourself: - Which steps did I take? - Did I apply any strategy? If so, describe it. - What wen well in the process? - What could have been better? - Am I satisfied with the decision that was taken?
Methodology	Synchronous Session - Present the exercise and the questions - Give trainees time to reflect these questions on a written paper - Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise Asynchronous Session - In a word document present the exercise and questions - Ask trainees to reflect on the same document and in the end read the conclusions - Trainees must upload their reflection on the platform
Conclusion: What trainees should take back from the exercise?	In order to potentiate your problem-solving and decision-making skills, you need to start by knowing yourself. You need to understand how you tend to solve problems and what is your process when deciding.

Lesson 2	
Title	What's my problem? Time to solve it!

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Objectives	Recognising a problem and how to solve it
Main Contents	• 4-Step model for problem-solving: IDEA
Key Messages	• Understand what the problem-solving process is • Understand how to problem-solve using the IDEA model;
Format	25% Asynchronous + 75% Synchronous
Duration	30 min (Asynchronous Video Lesson) + 1h30 (Synchronous Exercises) + 6,33H (Homework)
Learning Exercises (name)	L2.1: Time to apply!

Learning Exercise 2.1	
Title	Time to apply!
Duration	30 minutes
Objectives	• Understand the 4-step model • Apply the 4-step model into real-life situations
Type of Exercise	Individual
Link (if applied)	N/A
Guidance for the correct development	
Instructions	Remember Lesson 1 "Knowing myself" exercise? Well, it's time to apply what you've learn! Recall the situation you described in Lesson 1. Send yourself to the past, and imagine you are now – with all the knowledge you gain from problem solving process – solving that problem. Apply what you've learn so far, specifically the IDEA model for problem solving. 1. Identify the problem 2. Develop solutions 3. Execute the solution 4. Assess the results
Methodology	Synchronous Session • Present the exercise and the questions • Give trainees time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise

	Asynchronous Session
	• In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Trainees must upload their reflection on the platform
Conclusion: What trainees should take back from the exercise?	Decisions generate problems to be solved, but also is very often that in the process of solving a problem a decision needs to be made. Both processes are linked, and sometimes occur inside one another. To optimize the process of problem-solving try to apply the model IDEA whenever possible.

Lesson 3	
Title	I made a decision! Oh, wait… maybe not?
Objectives	Understanding the process of decision-making
Main Contents	• 5-Step model for decision-making • Psychological biases in decision-making
Key Messages	• Understand what the decision-making process is • Understand how to make better decision by using the 5-step model; • Understand the psychological biases that undermine decision-making
Format	25% Asynchronous + 75% Synchronous
Duration	30 min (Asynchronous Video Lesson) + 1h30 (Synchronous Exercises) + 6,33H (Homework)
Learning Exercises (name)	L3.1: Time to recall L3.2: Time to apply!

Learning Exercise 3.1	
Title	Time to recall
Duration	10 minutes
Objectives	• Recall the 5-step model • Recall the DIET strategy
Type of Exercise	Individual
Link (if applied)	N/A

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Guidance for the correct development	
Instructions	• What should you take into account when collecting information to make a decision?
Methodology	Synchronous Session • Present the exercise • Give trainees time to reflect on the question on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise Asynchronous Session • In a word document present the exercise • Ask trainees to reflect on the same document and in the end read the conclusions • Trainees must upload their reflection on the platform
Conclusion: What trainees should take back from the exercise?	A common error in business is to think that constant data collection and analyses leads to the creation of knowledge and wisdom, which therefore potentiate good decision making. However, the excess of data most of times leads to what James Marsh and colleagues named the "decision making by trash can", where agents, problems and solutions swirl in a metaphoric trash, leading people to choose the solution that arises first, whatever it may be. **The problem here is clearly not the lack of data, but the lack of ability to prioritize what is important**.

Learning Exercise 3.2	
Title	Time to apply!
Duration	15 minutes
Objectives	• Recall the psychological biases that can affect the decision-making process • Apply this to real-life situations
Type of Exercise	Self-reflection / Individual
Link (if applied)	N/A
Guidance for the correct development	
Instructions	**Remember a recent decision you had to make in your work or your personal life**, besides the day-to-day decisions you have to make, like deciding what to have for dinner. • Do you think that you were influenced by any psychological biases? Which ones?

Methodology	Synchronous Session
	- Present the exercise - Give trainees time to reflect on the question on a written paper - Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise Asynchronous Session - In a word document present the exercise - Ask trainees to reflect on the same document and in the end read the conclusions - Trainees must upload their reflection on the platform
Conclusion: What trainees should take back from the exercise?	The best way to avoid psychological biases and mind traps is to be aware of them. When you're making a decision try to remember the biases that you've learned and try to avoid them.

Lesson 4	
Title	I have 99 problems, and 100 ways to make a decision
Objectives	Distinguish ways to solve a problem and tools to make a decision
Main Contents	- Problem-solving techniques - Decision-making strategies
Key Messages	- Understand problem-solving techniques - Understand decision-making strategies
Format	25% Asynchronous + 75% Synchronous
Duration	30 min (Asynchronous Video Lesson) + 1h30 (Synchronous Exercises) + 6,33H (Homework)
Learning Exercises (name)	L3.1: Time to recall L3.2: Time to apply, one last time

Learning Exercise 4.1	
Title	Time to recall
Duration	15 minutes
Objectives	Applying a problem-solving technique learned to a real-life problem/situation
Type of Exercise	Self-reflection / Individual

Link (if applied)	N/A

Guidance for the correct development	
Instructions	Think about a problem or future problem you might have. Choose one of the techniques and step by step try to solve it.
Methodology	Synchronous Session • Present the exercise • Give trainees time to reflect on the question on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise Asynchronous Session • In a word document present the exercise • Ask trainees to reflect on the same document and in the end read the conclusions • Trainees must upload their reflection on the platform
Conclusion: What trainees should take back from the exercise?	By applying a technique previously learned, you will not only practice the application of problem-solving techniques to a real-life situation/problem, but also you may be able to see the problem in a new perspective and develop a solution to it.

Learning Exercise 4.1	
Title	Time to apply
Duration	30 minutes
Objectives	•
Type of Exercise	Self-reflection / Individual
Link (if applied)	N/A

Guidance for the correct development	
Instructions	In this exercise we invite you to recall people whose thinking skills you have admired. They can be people you have known personally or have studied, like a life partner, a parent, a friend or a boss or co-worker. In the right column write down as concisely and specifically as you can those thinking skills that impressed you and that you would like to have in your skills backpack. Try to think about at least of two people, you will see that you will find it easier than it looks!

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	Name:	**Thinking skills:**
	Look at your list, they represent skills you would like to have, and you may think now you should put effort to excel at all, to be perfect. That's not the aim, its not possible to be that superhero thinker, to be the perfection. You may know the story of the young man who searcher the world for the perfect wife. After some years he found her – but well she was also looking for the perfect husband! Perfection will always elude you, but excellence is a possibility!	
Methodology	Synchronous Session • Present the exercise • Give trainees time to reflect on the question on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise Asynchronous Session • In a word document present the exercise • Ask trainees to reflect on the same document and in the end read the conclusions • Trainees must upload their reflection on the platform	
Conclusion: What trainees should take back from the exercise?	The point of the Thinking Skills Mentor is to give you an ideal to aim for. Advances thinkers in any field tend to be lopsided, as sprinters, which excel at speed but are hopeless at long-distance running. We are not saying to be a thinker to "all seasons", but rather for you to look carefully at your field and where you see yourself positioned in it in (a) one year; (b) five years; and (c) ten years. Your ideal should be related to your field and want you would like to achieve now and in the future!	

8.2 Appendix B – Training Modules Curricula "Artificial Intelligence and Machine Learning for aviation applications"

Training Module:	Artificial Intelligence and Machine Learning for Aviation Applications
Partner Responsible:	University of Malta
Objectives:	• Explain basic Artificial Intelligence and Machine Learning concepts, techniques and algorithms

skill-UP

	• Examine current applications of AI/ML in different areas of the aviation industry • Identify future AI trends and applications in the aviation sector • Explain the various aspects of trustworthy AI within the context of aviation
Audience:	Aviation professionals (including pilots, air traffic controllers, drone operators, and airport operators) of all levels.
Duration:	Total: **25h** 3h (5 x asynchronous video lessons) + 0.5h (2 x drag-and-drop exercises) + 3h (3 x online discussions) + 1h (glossary) + 1h (concept map) + 8h (case study) + 1h (multiple-choice test) + 7.5h (reading and watching videos)
Format:	Fully asynchronous (self-learning with a set of support materials) to allow the completion of the course at one's pace. Various types of assessment exercises are provided throughout the course.
Training Path (S/U/R):	Skilling / upskilling / reskilling

Lesson 1	
Title	An introduction to Artificial Intelligence and Machine Learning
Objectives	• Introduce basic AI/ML terminology and concepts • Give a brief overview of the history of AI/ML • Discuss the key enablers of AI/ML • Describe the main capabilities and applications of AI/ML
Main Contents	• What is AI and ML? • A brief history of AI and ML • Enablers of AI and ML • Capabilities of AI and ML • Applications of AI and ML
Key Messages	• AI is a field of computer science which mimics human abilities • ML is a field of AI which allows a machine to perform tasks without being explicitly programmed • The field of AI started in the 1950s • Big data and supercomputing are two key enablers of AI and ML • AI and ML have several capabilities and applications
Format	100% Asynchronous

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Duration	32 min (asynchronous video lesson) + 1h (asynchronous exercise)
Learning Exercises (name)	Learning exercise 1.1 – Introduce yourself
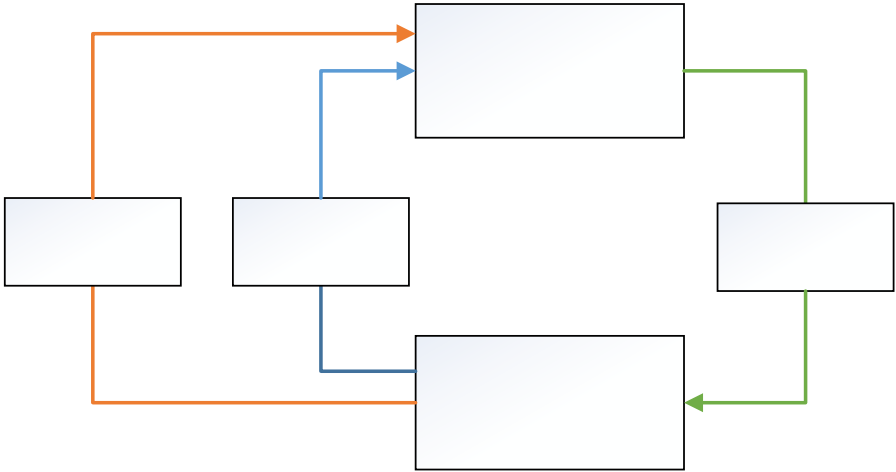
Learning Exercise 1.1	
Title	Introduce yourself
Duration	1h
Objectives	To allow the participants to get to know the instructor and their colleagues in an informal manner.
Type of Exercise	Online discussion
Link (If applied)	n/a
Guidance for the correct development	
Instructions	Take the time to introduce yourself to the instructor and your colleagues. Feel free to share your professional and personal background, including any interesting facts, and highlight your expectations for this course. You are more than welcome to include a picture of yourself or to upload a video with your post. You are also encouraged to read and reply to the posts of some of your peers.
Methodology	Asynchronous Session • Open the discussion at the beginning of the week corresponding to this lesson. • Ask the participants to introduce themselves to the instructor and their peers by submitting a post which is at least 100 words long. Participants may also upload a photo and/or video to introduce themselves. • Participants should submit their post before they can see other posts in the forum. • Encourage participants to read and reply to the posts of their colleagues. • Monitor the discussion at least once every 24 hours to check student participation and ensure that the discussion is proceeding in the right direction. • Close the discussion at the end of the week corresponding to this lesson.
Conclusion: What students should take back from the exercise?	This exercise serves as an ice-breaker. By the end of this exercise, the students will hopefully learn some interesting facts about their instructor and their peers, and begin to network with each other. This is essential to build a community of learners.

Lesson 2

SKILLING, UPSKILLING, RESKILLING IN THE FUTURE AIR TRANSPORT

skill-UP

Title	Machine Learning techniques and algorithms (Part 1)
Objectives	• Provide an overview of the ML model lifecycle • Describe the three main types of ML
Main Contents	• The ML model lifecycle • Supervised learning • Unsupervised learning • Reinforcement learning • Hybrid learning
Key Messages	• The lifecycle of an ML model consists of six steps • There are three main types of ML: supervised, unsupervised and reinforcement learning • It is possible to combine different types of ML to solve a given problem (aka hybrid ML)
Format	100% Asynchronous
Duration	38 min (asynchronous video lesson) + 0.25h (asynchronous exercise)
Learning Exercises (name)	Learning exercise 2.1 – The key components of reinforcement learning
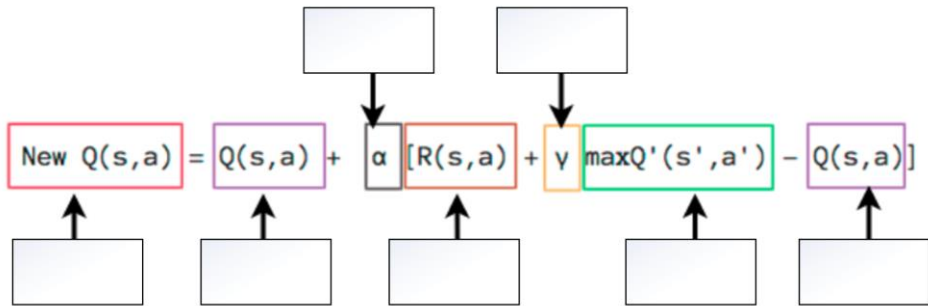
Learning Exercise 2.1	
Title	The key components of reinforcement learning
Duration	0.25h
Objectives	To correctly label the main components of a reinforcement learning model
Type of Exercise	Drag-and-drop
Link (If applied)	n/a
Guidance for the correct development	
Instructions	Drag the labels provided and drop them at the corresponding place in the diagram below:

skill-UP

Labels:

- Agent
- Environment
- Observation
- Reward
- Action

Methodology	Asynchronous Session
	• Provide the exercise to the students.
	• Students must upload their answers (in a word document or .pdf file) to the learning platform by the end of the week corresponding to this lesson.
Conclusion: What students should take back from the exercise?	The students should get a better understanding of the fundamentals of reinforcement learning.

Lesson 3	
Title	Machine Learning techniques and algorithms (Part 2)
Objectives	• Describe a few basic ML algorithms for each type of ML • Discuss some of the implementation challenges related to ML algorithms
Main Contents	• Simple linear regression • Artificial Neural Networks • k-means clustering • Q-learning • Implementation challenges
Key Messages	• Simple linear regression and ANNs are supervised learning algorithms • k-means clustering is an unsupervised learning algorithm • Q-learning is an RL algorithm • Various challenges are associated with ML algorithms
Format	100% Asynchronous

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Duration	52 min (asynchronous video lesson) + 0.25h (asynchronous exercise)
Learning Exercises (name)	Learning exercise 3.1 – The Bellman optimality equation

Learning Exercise 3.1	
Title	The Bellman optimality equation
Duration	0.25h
Objectives	To correctly label the different parts of the Bellman optimality equation
Type of Exercise	Drag-and-drop
Link (If applied)	n/a
Guidance for the correct development	
Instructions	Drag the labels provided and drop them at the corresponding place in the diagram below:

$$New\ Q(s,a) = Q(s,a) + \alpha\ [R(s,a) + \gamma\ maxQ'(s',a') - Q(s,a)]$$

Labels:
- Updated Q value
- Current Q value
- Reward
- Maximum expected future reward
- Current Q value
- Learning rate
- Discount rate |
| Methodology | Asynchronous Session

- Provide the exercise to the students.

- Students must upload their answers (in a word document or .pdf file) to the learning platform by the end of the week corresponding to this lesson. |
| Conclusion: What students | The students should get a better understanding of the Bellman optimality equation as it relates to Q-learning. |

should take back from the exercise?	

Lesson 4	
Title	Current and emerging applications of ML in aviation
Objectives	• Present and discuss real-world applications and case studies of AI and ML within different segments of the aviation industry
Main Contents	• ML for aircraft design and manufacturing • ML for aircraft operations and maintenance • ML for Air Traffic Management • ML for airport operations • ML for drones and U-space
Key Messages	• ML is an enabler of industry 4.0 • ML is having a positive impact on aviation and is being used across the entire industry • Different ML applications are at various stages of maturity • ML is often in conjunction with other technologies such as computer vision, additive manufacturing, digital twins, and blockchain.
Format	100% Asynchronous
Duration	39 min (asynchronous video lesson) + 1h (asynchronous exercise)
Learning Exercises (name)	Learning exercise 4.1 – Applications of AI/ML in Aviation

Learning Exercise 4.1	
Title	Applications of AI/ML in Aviation
Duration	1h
Objectives	To allow the participants to identify real-world use cases of AI/ML in aviation which are different from those described by the instructor in the video lesson.
Type of Exercise	Online discussion
Link (If applied)	n/a
Guidance for the correct development	
Instructions	In this lesson we have looked at several practical use cases of AI and ML in aviation. Conduct a search and identify another real-world use case of AI/ML in aviation. Explain how AI/ML is being applied in this use case and provide references to support your post. **Guidelines:** • Your initial post should be at least 100 words long.

	• Try to submit your initial post early in the week to allow for meaningful discussions. • In addition to your initial post, read and reply to the posts of at least two peers. • Your posts and responses to your peers should be thoughtful, thorough and respectful. Your responses should be more than 'I agree/disagree' – you need to elaborate and explain why you agree or disagree. • It is encouraged to ask questions to keep the discussion going. • This discussion ends on the last day of the week corresponding to this lesson
Methodology	Asynchronous Session • Open the discussion at the beginning of the week corresponding to this lesson. • Ask the participants to submit an initial post which is at least 100 words long. • Participants should submit their post before they can see other posts in the forum. • Encourage participants to read and reply to the posts of their colleagues. • Monitor the discussion at least once every 24 hours to check student participation and ensure that the discussion is proceeding in the right direction. • Close the discussion at the end of the week corresponding to this lesson.
Conclusion: What students should take back from the exercise?	The students should have a better appreciation of the wide range of ML/AI applications in the aviation sector.

Lesson 5	
Title	Towards trustworthy AI
Objectives	• Discuss various aspects of trustworthy AI and their implications for the aviation sector.
Main Contents	• Explainability • Certification • Cybersecurity • Bias • Privacy & data protection • Promotion of trustworthy AI
Key Messages	• AI promises to revolutionise our lives and the aviation sector; however, in order for AI to be acceptable to society, it needs to be trustworthy. • Trustworthy AI is explainable, safe, secure and unbiased. • The aviation industry is taking a risk-based approach to the adoption of AI. • Design guidelines and standards are being developed to support the certification and deployment of AI applications in the aviation sector.
Format	100% Asynchronous
Duration	30 min (asynchronous video lesson) + 1h (asynchronous exercise)
Learning Exercises (name)	Learning exercise 5.1 – Towards trustworthy AI

Learning Exercise 5.1	
Title	Towards trustworthy AI
Duration	1h
Objectives	To discuss the importance of explainable and unbiased AI.
Type of Exercise	Online discussion
Link (If applied)	n/a
Guidance for the correct development	
Instructions	Explain why it is important for AI to be explainable and unbiased. Provide a practical example to support your answer. **Guidelines:** • Your initial post should be at least 100 words long. • Try to submit your initial post early in the week to allow for meaningful discussions. • In addition to your initial post, read and reply to the posts of at least two peers. • Your posts and responses to your peers should be thoughtful, thorough and respectful. Your responses should be more than 'I agree/disagree' – you need to elaborate and explain why you agree or disagree. • It is encouraged to ask questions to keep the discussion going. • This discussion ends on the last day of the week corresponding to this lesson.
Methodology	Asynchronous Session • Open the discussion at the beginning of the week corresponding to this lesson. • Ask the participants to submit an initial post which is at least 100 words long. • Participants should submit their post before they can see other posts in the forum. • Encourage participants to read and reply to the posts of their colleagues. • Monitor the discussion at least once every 24 hours to check student participation and ensure that the discussion is proceeding in the right direction. • Close the discussion at the end of the week corresponding to this lesson.
Conclusion: What students should take back from the exercise?	Students should have a better understanding of the importance of trustworthy AI, and of the key elements of trustworthy AI.

8.3 Appendix C – Training Modules Curricula "Deepening of Situation Awareness"

Training Module:	Deepening of situation awareness
Partner Responsible:	ENAC
Objectives:	• understand the concept of situation awareness • apply the concept of situation awareness to real-world situations • evaluate the self-assessment of situation awareness
Audience:	All (transversal)
Duration:	3,5h (async) + 1,25h (sync) + 12h (self-study) + 2h (application in real-world) + 1h post-training assessment
Format:	Asynchronous: self-learning with a set of support materials to learn the theoretical concepts related to situation awareness Synchronous: video conference lessons with a trainer to guide learners in applying the concept of SA to real-world situations
Training Path (S/U/R):	Skilling and Upskilling

Lesson 1	
Title	Fundamentals of Situation Awareness
Objectives	• remember Situation Awareness definition • understand Situation Awareness theory and related concepts • understand principles of Situation Awareness measurement

Main Contents	• Situation Awareness's definition from Mica Endsley (1988)
	• The 3 levels of Situation Awareness
	• Situation Awareness and related concepts:
	   o Decision making
	   o Attention
	   o Working memory
	   o Long term memory
	   o Pattern matching
	   o Goals and expectations

Key Messages	• Understand Endsley's definition of Situation Awareness • Understand that Situation Awareness is distinct from decision making • Understand the impact of attention management on Situation Awareness • Understand that limits of working memory pose constraints on Situation Awareness • Understand that mental models stored in long term memory, goals and expectations may have both positive and negative effects on Situation Awareness
Format	100% Asynchronous

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Duration	38 min (Asynchronous video lesson) + 2h (homework)
Learning Exercises (name)	

Learning Exercise 1.1	
Title	Endsley (1995)'s model SA and decision making
Duration	30 min
Objectives	Understand how SA is related to other concepts
Type of Exercise	Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Draw Endsley's model with the 3 levels of SA, state of environment, decision, performance, individual factors and feedback
Methodology	Students must upload their drawing on the platform
Conclusion: What students should take back from the exercise?	To check that they understood and remembered well how all these concepts are related together.

Learning Exercise 1.2	
Title	Measurement of SA
Duration	15 min
Objectives	Understand implications of SA theory for measurement of SA
Type of Exercise	Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Cite an example of implication of SA theory for measurement of SA

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Methodology	Students must upload their example on the platform
Conclusion: What students should take back from the exercise?	To check that they understood and remembered at least one implication of SA theory to SA measurement.

Lesson 2	
Title	Situation Awareness measurement
Objectives	• understand Situation Awareness subjective measurement principles • understand principles of Situation Awareness measurement through queries
Main Contents	• Situation Awareness's subjective measures: benefits and limits • The SART : subjective Multidimensional Scale Technique (based on 10 constructs) developed by Taylor (1990) • The 3D-SART : an abbreviated version of the SART • The SAGAT online freeze technique : Situation Awareness Global Assessment Technique (Endsley, 1990)
Key Messages	• The SART assesses Instability of situation, variability of situation, complexity of situation, arousal, spare mental capacity, concentration, division of attention, information quantity, information quality and familiarity • The 3D SART assesses attentional demand, attentional supply and level of understanding • Understand limits of subjective scales • Understand the principles of development of SAGAT queries
Format	100% Asynchronous
Duration	36 min (Asynchronous video lesson) + 2h (homework)
Learning Exercises (name)	

Learning Exercise 2.1	
Title	SART
Duration	15 min
Objectives	Understand the principles of the SART technique
Type of Exercise	Individual
Link (If applied)	N/A

Guidance for the correct development	
Instructions	Imagine a question to assess the "spare mental capacity" of the SART and corresponding rating scale
Methodology	Students must upload their question and rating scale on the platform
Conclusion: What students should take back from the exercise?	To check that they understood and remembered the SART technique

Learning Exercise 2.2	
Title	SA queries
Duration	15 min
Objectives	Understand the principles of the SA queries
Type of Exercise	Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Imagine SA queries for car drivers
Methodology	Students must upload their SA queries on the platform
Conclusion: What students should take back from the exercise?	To check that they understood and remembered the principles of SA queries

Lesson 3	
Title	Cognitive processes behind Situation Awareness
Objectives	• understand principles of human perception • understand principles of situation model and mental model

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Main Contents	• Perception, pattern recognition and goals
	• The three levels of the model of comprehension of dynamic situations (Durso et al., 2007) derived from Kintsch's text comprehension model:
	o Surface level
	o Eventbase
	o Situation model
	• Situation model and mental model
Key Messages	• Pattern matching is both influenced by bottom-up and top-down processing
	• Goals serve critical functions: direct selection of mental model, direct attention, and are used to interpret information to achieve comprehension
	• Situation models are specific cases of a general mental model
Format	100% Asynchronous
Duration	36 min (Asynchronous video lesson) + 2h (homework)
Learning Exercises (name)	

Learning Exercise 3.1	
Title	SA comprehension
Duration	15 min
Objectives	Understand the construct of SA
Type of Exercise	Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Find the missing word (first and last letters are given): "The construct of SA essentially allows researchers and designers to adress the issue of m-------g.
Methodology	Students must upload their answer on the platform
Conclusion: What students should take back from the exercise?	To check that they understood what the SA essentially represents.

Learning Exercise 3.2	
Title	Situation model
Duration	30 min
Objectives	Understand the situation model
Type of Exercise	Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Imagine elements of the 3 levels of the situation model used by an experimented car driver in a situation when you perceive a car coming from the right:
Methodology	Students must upload their answer on the platform
Conclusion: What students should take back from the exercise?	To check that they understood the situation model.

Learning Exercise 3.3	
Title	Situation model and experience
Duration	15 min
Objectives	Understand the situation model
Type of Exercise	Individual
Link (If applied)	N/A
Guidance for the correct development	

Instructions	Two team members in a given situation, with a beginner and an experimented operator, will necessarily have the same situation model.
	▪ True
	▪ False
Methodology	Students must upload their answer on the platform
Conclusion: What students should take back from the exercise?	To check that they understood the situation model.

Lesson 4	
Title	Scanning techniques for Situation Awareness
Objectives	• understand and remember efficient visual strategies highlighted by research studies
	• understand and remember principles results of research studies assessing the training effectiveness of visual scanning improvement methods
Main Contents	• basics about eye tracking method
	• research studies about efficient visual strategies:
	o Bellenkes et al. (1997): expert and novice pilots
	o Haslbeck and Zhang (2017) : short haul and long haul pilots
	o Van Meeven et al. (2014): ATCO experts, intermediates and novices
	o Konstantopoulos et al. (2010): learner drivers and driving instructors
	• Research studies assessing training effectiveness of visual scanning improvement methods, also called "Eye-movement modelling example" (EMME) studies
	o Jarodzka et al. (2012): teaching clinical reasoning
	o Kang et al. (2014): training for an ATC conflict detection task
	o Sadasivan et al. (2005): training for an aircraft inspection task
Key Messages	• Research studies about efficient visual strategies usually show that experts have a higher sampling rate of elements of the environments than novices
	• Research studies have shown that attention guidance could enhance learning in various domains
Format	100% Asynchronous
Duration	52 min (Asynchronous video lesson) + 3h (homework)
Learning Exercises (name)	

Learning Exercise 4.1	
Title	Scanning techniques
Duration	30 min
Objectives	Understand and remember results from research studies on visual scanning techniques
Type of Exercise	Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	What are the common findings of previous study on driving and the first study conducted on pilots?
Methodology	Students must upload their answer on the platform
Conclusion: What students should take back from the exercise?	To check that they understood the findings on visual scanning techniques.

Learning Exercise 4.2	
Title	EMME
Duration	15 min
Objectives	Remember the acronym EMME
Type of Exercise	Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	What does the acronym EMME stand for?
Methodology	Students must upload their answer on the platform
Conclusion: What students should take	To check that they remembered what EMME stands for.

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back from the exercise?	

Lesson 5	
Title	Metacognition and efficient strategies
Objectives	• understand and remember basics about metacognition • understand and remember efficient strategies regarding metacognition • understand and remember principle guidelines for SA training

Main Contents	• basics about metacognition, Nelson and Narens (1990)'s model
	• Situation Awareness and overconfidence
	• Two exemples of research studies about metacognitive training in driving:
	    o Soliman and Mathna (2009): experts and novice drivers
	    o Horswill et al. (2021): trained vs control groups

Key Messages	• Subjective measures of Situation Awareness correspond to a metacognitive judgment. • Risks of overconfidence in one's own judgement of one's performance • Research studies have shown that it is possible to enhance performance through metacognitive training.
Format	100% Asynchronous
Duration	53 min (Asynchronous video lesson) + 3h (homework)
Learning Exercises (name)	

Learning Exercise 5.1	
Title	metacognition
Duration	15 min
Objectives	Understand the principle of metacognition
Type of Exercise	Individual
Link (If applied)	N/A
Guidance for the correct development	

Instructions	Subjective measures of SA can be considered as recruiting metacognitive processes.
	    ➤ True
	    ➤ False

Methodology	Students must upload their answer on the platform
Conclusion: What students should take back from the exercise?	To check that they understood that assessing one's own SA is a metacognitive process.

Learning Exercise 5.2	
Title	Bias in judgment
Duration	15 min
Objectives	Understand the bias in self-assessing one's own SA
Type of Exercise	Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Cite a frequent bias in self-assessing one's own situation awareness
Methodology	Students must upload their answer on the platform
Conclusion: What students should take back from the exercise?	To check that they understood that assessing one's own SA is bias prone.

Learning Exercise 5.3	
Title	SA training guidelines
Duration	15 min
Objectives	Understand and remember the target areas for improving one's SA
Type of Exercise	Individual
Link (If applied)	N/A

Guidance for the correct development	
Instructions	Cite the four target areas for improving individual pilot SA
Methodology	Students must upload their answer on the platform
Conclusion: What students should take back from the exercise?	To check that they understood general principles for SA training.

8.4 Appendix D – Training Modules Curricula of "Strengthening Psychological Capital"

Training Module:	Strengthening Psychological Capital (PsyCap)
Partner Responsible:	Kastamonu University
Objectives:	-To understand the concept of psychological capital (PsyCap) and its dimensions (hope, self-efficacy, resilience, optimism)
	-To aware of the sense of seeing a better future and the confidence in the abilities for achieving positive outcomes
	-To aware of the positive ways of coping with negative situations and learn how to remain positive
	-To learn how to develop psychological capital at work life
	-To evaluate self assessment of psychological capital
Audience:	ATCOs, Pilots, RPAS pilots and airport operators
Duration:	6h (sync/assync) + 19h (self-study) + 1h post-training assessment
Format:	Online synchronous, in person and online asynchronous
Training Path (S/U/R):	Reskilling and upskilling

Lesson 1	
Title	Start-Participation assessment
Objectives	The participants will introduce themselves and explore the general view of the training module
Main Contents	-Exploring general view of the training module
	-Knowing participants

Key Messages	Participants should learn the training system and explore the training module for gaining effective outputs from the training they will take.
Format	online asynchronous
Duration	30 minutes
Learning Exercises (name)	N/A

Lesson 2	
Title	Positive organizational behavior
Objectives	The participants will learn the concept of organizational behavior and positive psychology
Main Contents	-Organizational Behavior -Positive Psychology -Positive Organizational Behavior -Psychological Capital
Key Messages	An organization is a dynamic social system. Understanding the behavior of people in organizations is the top concern of all managers and leaders. Positive organizational behavior (POB) is interested in the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement in today's workplace.
Format	online asynchronous
Duration	40 minutes
Learning Exercises (name)	L2.1: Drag and Drop Exercise L2.2: One Sentence Summary Exercise

Learning Exercise 2.1	
Title	L2.1: Drag and Drop Exercise
Duration	10 minutes
Objectives	-Understand organizational behavior
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and drag the required labels and drop them at the correspondent box. A diagram has been uploaded to training platform, so trainees can download it, answer and upload it again filled in the platform.

Methodology	A Drag and Drop exercise requires the trainees to drag a piece of text (e.g. a word or a phrase) or an image and drop it at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to sort, group, match, or place information they have learned from the lessons.

Learning Exercise 2.2	
Title	L2.2: One Sentence Summary Exercise
Duration	20 minutes
Objectives	-Understand organizational behavior -Understand positive psychology -Understand positive organizational behavior -Understand psychological capital
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and sum up the main learning goals of the lesson in one sentence. A document has been uploaded to training platform, so trainees can download it, insert what they have learned from the required place and upload it again filled in the platform.
Methodology	A One Sentence Summary exercise requires the trainees to sum up their learning from the lesson and insert their answer at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to show their learning level and reflect their knowledge on the lesson before moving forward to the next lesson.

Lesson 3	
Title	Psychological capital (PsyCap)
Objectives	The participants will determine the meaning of psychological capital (PsyCap) and its dimensions

Main Contents	-The Path to Psychological Capital -Psychological Capital (PsyCap) -Components of Psychological Capital -How to Manage Psychological Capital
Key Messages	Psychological Capital (PsyCap) is described as an individual's positive psychological state of development. PsyCap comprises four positive psychological resources and is characterized by hope, self-efficacy, resilience and optimism.
Format	online asynchronous
Duration	40 minutes
Learning Exercises (name)	L3.1: Drag and Drop Exercise L3.2: One Sentence Summary Exercise L3.3: Concept Map

Learning Exercise 3.1	
Title	L3.1: Drag and Drop Exercise
Duration	10 minutes
Objectives	-Understand psychological capital (PsyCap)
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and drag the required labels and drop them at the correspondent box. A diagram has been uploaded to training platform, so trainees can download it, answer and upload it again filled in the platform.
Methodology	A Drag and Drop exercise requires the trainees to drag a piece of text (e.g. a word or a phrase) or an image and drop it at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to sort, group, match, or place information they have learned from the lessons.

Learning Exercise 3.2	
Title	L3.2: One Sentence Summary Exercise
Duration	20 minutes
Objectives	-Understand the path to psychological capital

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	-Understand psychological capital (PsyCap)
	-Understand components of psychological capital
	-Understand how to manage psychological capital
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and sum up the main learning goals of the lesson in one sentence. A document has been uploaded to training platform, so trainees can download it, insert what they have learned from the required place and upload it again filled in the platform.
Methodology	A One Sentence Summary exercise requires the trainees to sum up their learning from the lesson and insert their answer at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhances trainees to show their learning level and reflect their knowledge on the lesson before moving forward to the next lesson.

Learning Exercise 3.3	
Title	L3.3: Concept Map
Duration	20 minutes
Objectives	-Understand the path to psychological capital
	-Understand psychological capital (PsyCap)
	-Understand components of psychological capital
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and illustrate the relationship between the main topic (psychological capital) and other supporting details. A document has been uploaded to training platform, so trainees can download it, fill the concepts in the required place and upload it again filled in the platform.
Methodology	A Concept Map exercise requires the trainees to form relationship between the main topic (psychological capital) and other supporting details and fill the concepts they thought at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.

Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to show a visual representation of their comprehension of the main topic and the relations that they can form between different concepts related to the topic.

Lesson 4	
Title	Leadership at PsyCap
Objectives	The participants will explain the role of leadership at PsyCap
Main Contents	-Leadership -Positive Approach to Leadership -Transformational Leadership -Authentic Leadership -Servant Leadership -Spiritual Leadership -Leadership and PsyCap
Key Messages	Leadership, is the way a manager initiates conversation to establish and accomplish the organization's vision, goals, and processes. Positive approach to leadership is a strength-based understanding of managing and inspiring others. Positive leadership theories includes transformational, authentic, servant, and spiritual leadership.
Format	online asynchronous
Duration	40 minutes
Learning Exercises (name)	L4.1: Drag and Drop Exercise L4.2: One Sentence Summary Exercise

Learning Exercise 4.1	
Title	L4.1: Drag and Drop Exercise
Duration	10 minutes
Objectives	-Understand positive approach to leadership
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and drag the required labels and drop them at the correspondent box. A diagram has been uploaded to training platform, so trainees can download it, answer and upload it again filled in the platform.
Methodology	A Drag and Drop exercise requires the trainees to drag a piece of text (e.g. a word or a phrase) or an image and drop it at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document

	in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to sort, group, match, or place information they have learned from the lessons.

Learning Exercise 4.2	
Title	L4.2: One Sentence Summary Exercise
Duration	20 minutes
Objectives	-Understand leadership -Understand positive approach to leadership -Understand transformational leadership -Understand authentic leadership -Understand servant leadership -Understand spiritual leadership -Understand the role of leadership at PsyCap
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and sum up the main learning goals of the lesson in one sentence. A document has been uploaded to training platform, so trainees can download it, insert what they have learned from the required place and upload it again filled in the platform.
Methodology	A One Sentence Summary exercise requires the trainees to sum up their learning from the lesson and insert their answer at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to show their learning level and reflect their knowledge on the lesson before moving forward to the next lesson.

Lesson 5	
Title	Positive antecedents of PsyCap - I
Objectives	The participants will aware of the positive antecedents of PsyCap

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Main Contents	-Discovering Positive Antecedents for PsyCap
	-Classification of PsyCap's Positive Antecedents
Key Messages	Since the concept of PsyCap was introduced, researches, which are trying to explore the antecedents of PsyCap, addresses the need to understand what systems and structures within persons and organizational life are positive predictors of PsyCap.
Format	online asynchronous
Duration	40 minutes
Learning Exercises (name)	L5.1: Drag and Drop Exercise
	L5.2: One Sentence Summary Exercise
	L5.3: One Question Quiz Exercise

Learning Exercise 5.1	
Title	L5.1: Drag and Drop Exercise
Duration	10 minutes
Objectives	-Understand the positive antecedents of PsyCap
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and drag the required labels and drop them at the correspondent box. A diagram has been uploaded to training platform, so trainees can download it, answer and upload it again filled in the platform.
Methodology	A Drag and Drop exercise requires the trainees to drag a piece of text (e.g. a word or a phrase) or an image and drop it at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to sort, group, match, or place information they have learned from the lessons.

Learning Exercise 5.2	
Title	L5.2: One Sentence Summary Exercise
Duration	20 minutes
Objectives	-Discovering positive antecedents for PsyCap
	-Understand the classification of PsyCap's positive antecedents

Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and sum up the main learning goals of the lesson in one sentence. A document has been uploaded to training platform, so trainees can download it, insert what they have learned from the required place and upload it again filled in the platform.
Methodology	A One Sentence Summary exercise requires the trainees to sum up their learning from the lesson and insert their answer at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to show their learning level and reflect their knowledge on the lesson before moving forward to the next lesson.

Learning Exercise 5.3	
Title	L5.3: One Question Quiz Exercise
Duration	5 minutes
Objectives	-Understand positive antecedents for PsyCap
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and answer the question in a short time. A document has been uploaded to training platform, so trainees can download it, answer the question in a short time and upload it again filled in the platform.
Methodology	A One Question Quiz exercise requires the trainees to reflect their learning from the lesson and answer a single question with a specific goal in a short time. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to answer on the same document, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity assess the knowledge trainees gain from the lesson and trainees will reflect on their learning from the lesson and make personal connections with their lives.

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Lesson 6	
Title	Positive antecedents of PsyCap - II
Objectives	The participants will aware of the positive antecedents of PsyCap
Main Contents	-Positive Antecedents of PsyCap -Discussion
Key Messages	PsyCap has been linked to numerous positive antecedents that can be observed in our work life.
Format	online synchronous
Duration	40 minutes
Learning Exercises (name)	L6.1: One Sentence Summary Exercise

Learning Exercise 6.1	
Title	L6.1: One Sentence Summary Exercise
Duration	20 minutes
Objectives	-Understand PsyCap's positive antecedents
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and sum up the main learning goals of the lesson in one sentence. A document has been uploaded to training platform, so trainees can download it, insert what they have learned from the required place and upload it again filled in the platform.
Methodology	A One Sentence Summary exercise requires the trainees to sum up their learning from the lesson and insert their answer at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to show their learning level and reflect their knowledge on the lesson before moving forward to the next lesson.

Lesson 7	
Title	Negative antecedents of PsyCap - I
Objectives	The participants will aware of the negative antecedents of PsyCap

Main Contents	-Psychological Capital
	-Why do we need to know the antecedents of Psychological Capital?
	-Negative antecedents of Psychological Capital
Key Messages	Researches on PsyCap aim to define what systems and structures within persons and organizational life are negative predictors of PsyCap.
Format	online asynchronous
Duration	40 minutes
Learning Exercises (name)	L7.1: One Sentence Summary Exercise
	L7.2: One Question Quiz Exercise

Learning Exercise 7.1	
Title	L7.1: One Sentence Summary Exercise
Duration	20 minutes
Objectives	-Understand PsyCap's negative antecedents
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and sum up the main learning goals of the lesson in one sentence. A document has been uploaded to training platform, so trainees can download it, insert what they have learned from the required place and upload it again filled in the platform.
Methodology	A One Sentence Summary exercise requires the trainees to sum up their learning from the lesson and insert their answer at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to show their learning level and reflect their knowledge on the lesson before moving forward to the next lesson.

Learning Exercise 7.2	
Title	L7.2: One Question Quiz Exercise
Duration	5 minutes
Objectives	-Understand negative antecedents for PsyCap
Type of Exercise	Self-reflection / Individual exercise

Link (If applied)	N/A

Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and answer the question in a short time. A document has been uploaded to training platform, so trainees can download it, answer the question in a short time and upload it again filled in the platform.
Methodology	A One Question Quiz exercise requires the trainees to reflect their learning from the lesson and answer a single question with a specific goal in a short time. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to answer on the same document, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity assess the knowledge trainees gain from the lesson and trainees will reflect on their learning from the lesson and make personal connections with their lives.

Lesson 8	
Title	Negative antecedents of PsyCap - II
Objectives	The participants will aware of the negative antecedents of PsyCap
Main Contents	-Case Study -Negative Antecedents of PsyCap
Key Messages	PsyCap has been linked to numerous negative antecedents that can be observed in our work life.
Format	online asynchronous
Duration	40 minutes
Learning Exercises (name)	L8.1: One Sentence Summary Exercise

Learning Exercise 8.1	
Title	L8.1: One Sentence Summary Exercise
Duration	20 minutes
Objectives	-Understand PsyCap's negative antecedents
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A

Guidance for the correct development	

Instructions	Duty of the trainee is to open the related exercise document in the training platform and sum up the main learning goals of the lesson in one sentence. A document has been uploaded to training platform, so trainees can download it, insert what they have learned from the required place and upload it again filled in the platform.
Methodology	A One Sentence Summary exercise requires the trainees to sum up their learning from the lesson and insert their answer at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to show their learning level and reflect their knowledge on the lesson before moving forward to the next lesson.

Lesson 9	
Title	Self-assessment of PsyCap
Objectives	The participants will evaluate his/her self assessment of PsyCap
Main Contents	-Psychological Capital -Hope -Self-efficacy -Resilience -Optimism -Discussion
Key Messages	Psychological capital can be managed and assessed.
Format	online synchronous
Duration	40 minutes
Learning Exercises (name)	L9.1: One Sentence Summary Exercise

Learning Exercise 9.1	
Title	L9.1: One Sentence Summary Exercise
Duration	20 minutes
Objectives	-Evaluate self assessment of PsyCap
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A

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	Guidance for the correct development
Instructions	Duty of the trainee is to open the related exercise document in the training platform and sum up the main learning goals of the lesson in one sentence. A document has been uploaded to training platform, so trainees can download it, insert what they have learned from the required place and upload it again filled in the platform.
Methodology	A One Sentence Summary exercise requires the trainees to sum up their learning from the lesson and insert their answer at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to show their learning level and reflect their knowledge on the lesson before moving forward to the next lesson.

Lesson 10	
Title	Effcets of PsyCap
Objectives	The participants will learn the effects of PsyCap
Main Contents	-Understanding Outcomes of PsyCap -Classification of PsyCap's Outcomes
Key Messages	Psychological capital generate desirable employee attitudes, behaviors and performance outcomes and neutralize undesirable attitudinal and behavioral outcomes. PsyCap has been linked to numerous outcomes, including individual level, team level and organizational level.
Format	online synchronous
Duration	40 minutes
Learning Exercises (name)	L10.1: Drag and Drop Exercise L10.2: One Sentence Summary Exercise L10.3: One Question Quiz Exercise

Learning Exercise 10.1	
Title	L10.1: Drag and Drop Exercise
Duration	10 minutes
Objectives	-Understand the outcomes of PsyCap -Understand the classification of PsyCap's outcomes
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	

Instructions	Duty of the trainee is to open the related exercise document in the training platform and drag the required labels and drop them at the correspondent box. A diagram has been uploaded to training platform, so trainees can download it, answer and upload it again filled in the platform.
Methodology	A Drag and Drop exercise requires the trainees to drag a piece of text (e.g. a word or a phrase) or an image and drop it at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to sort, group, match, or place information they have learned from the lessons.

Learning Exercise 10.2	
Title	L10.2: One Sentence Summary Exercise
Duration	20 minutes
Objectives	-Discovering outcomes of PsyCap -Understand the classification of PsyCap's outcomes
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and sum up the main learning goals of the lesson in one sentence. A document has been uploaded to training platform, so trainees can download it, insert what they have learned from the required place and upload it again filled in the platform.
Methodology	A One Sentence Summary exercise requires the trainees to sum up their learning from the lesson and insert their answer at the corresponding place. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to reflect on the same document their views and in the end read the conclusions, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity enhance trainees to show their learning level and reflect their knowledge on the lesson before moving forward to the next lesson.

Learning Exercise 10.3	
Title	L10.3: One Question Quiz Exercise
Duration	5 minutes

Objectives	-Understand the outcomes of PsyCap
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise document in the training platform and answer the question in a short time. A document has been uploaded to training platform, so trainees can download it, answer the question in a short time and upload it again filled in the platform.
Methodology	A One Question Quiz exercise requires the trainees to reflect their learning from the lesson and answer a single question with a specific goal in a short time. This exercise is in an asynchronous session manner. So, the exercise will be presented in a document in the training platform, trainees are asked to answer on the same document, and finally they must upload their reflection on the platform.
Conclusion: What students should take back from the exercise?	This type of activity assess the knowledge trainees gain from the lesson and trainees will reflect on their learning from the lesson and make personal connections with their lives.

Learning Exercise for Summative Assessment	
Title	Multiple-Choice Test
Duration	1 hour 30 minutes
Objectives	-The participants will learn the concept of organizational behavior and positive psychology -The participants will determine the meaning of psychological capital (PsyCap) and its dimensions -The participants will explain the role of leadership at PsyCap -The participants will aware of the positive antecedents of PsyCap -The participants will aware of the negative antecedents of PsyCap -The participants will evaluate his/her self assessment of PsyCap -The participants will learn the effects of PsyCap
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise in the training platform and answer the questions by following the necessary steps.
Methodology	A Multiple-Choice Test requires the trainees to reflect their learning from the training module and answer questions with a specific goal. This exercise is in an asynchronous session manner. So, the exercise will be presented in the training platform, and trainees are asked to answer the questions by following the necessary steps.

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Conclusion: What students should take back from the exercise?	This type of activity assess the knowledge trainees gain from the training module and trainees will reflect on their learning. Being as one of the components, included in the grading system, Multiple-Choice Test will contribute to the trainees' assessment in the training module as a final theoretical test.

Learning Exercise for Summative Assessment	
Title	Case Study
Duration	8 hour
Objectives	-The participants will learn the concept of organizational behavior and positive psychology -The participants will determine the meaning of psychological capital (PsyCap) and its dimensions -The participants will explain the role of leadership at PsyCap -The participants will aware of the positive antecedents of PsyCap -The participants will aware of the negative antecedents of PsyCap -The participants will evaluate his/her self assessment of PsyCap -The participants will learn the effects of PsyCap
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise in the training platform, read and evaluate the specific problem or situation, and to formulate a plan of action to solve/ address the issue they encounter in the case presented to them by following the necessary steps.
Methodology	A Case Study requires the trainees to reflect their learning from the training module and formulate a plan of action to solve/ address the issue they encounter in the case presented to them. This exercise is in an asynchronous session manner. So, the exercise will be presented in the training platform, and trainees are asked to answer the specific questions in the context of the problems faced in the related case by following the necessary steps.
Conclusion: What students should take back from the exercise?	This type of activity assess the knowledge trainees gain from the training module and trainees will reflect on their learning. Being as one of the components, included in the grading system, Case Study will contribute to the trainees' assessment in the training module by focusing on the practical application of the training module.
Learning Exercise for Progress Assessment	
Title	Glossary
Duration	5 hour
Objectives	-The participants will learn the concept of organizational behavior and positive psychology -The participants will determine the meaning of psychological capital (PsyCap) and its dimensions -The participants will explain the role of leadership at PsyCap

	-The participants will aware of the positive antecedents of PsyCap
	-The participants will aware of the negative antecedents of PsyCap
	-The participants will evaluate his/her self assessment of PsyCap
	-The participants will learn the effects of PsyCap
Type of Exercise	Self-reflection / Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Duty of the trainee is to open the related exercise in the training platform, read the list of terms presented, and explain or define complex and/or crucial concepts/expressions by following the necessary steps.
Methodology	A Glossary requires the trainees to reflect their learning from the training module and explain or define complex and/or crucial concepts/expressions in terms of the list of terms presented to them. This exercise is in an asynchronous session manner. So, the exercise will be presented in the training platform, and trainees are asked to explain or define the specific terms by following the necessary steps.
Conclusion: What students should take back from the exercise?	This type of activity assess the knowledge trainees gain from the training module and trainees will reflect on their learning. Being as one of the components, included in the grading system, Glossary aims to assess the trainees' comprehension of the key concepts in the training module.

8.5 Appendix E – Training Module Curricula "Change Management for Automation and Emerging Technologies"

Training Module:	Change Management for Automation and Emerging Technologies
Partner Responsible:	ESTU
Objectives:	Understand the basic concept of change management such as change, innovation and adaptations
	Understand the reason and need for change
	Define the Human Factor in Change Management
	Discuss resistance to change
	Analysing constantly changing and unchanging evaluations in airport operations
	Analyse Adaptive innovative solutions for the changing environment
Audience:	Airport Operators
Duration:	5h (sync/async)

Format:	Synchronous moments (this is, video conference lessons with a trainer) to stimulate communication among participants
	Asynchronous moments (self-learning with a set of support materials) to allow the completion of the course at one's pace
	Practical case studies throughout the course
Training Path (S/U/R):	Skilling and Upskilling

Lesson 1	
Title	Concept of change
Objectives	Understanding the concept of change
Main Contents	- Introduction - Aviation environment - Change - Sigmoid Curve - Goals of organizations - Positive and Negative Change - Types of change - Change over time - Components of change - Senders and receivers - Resistance and comfort
Key Messages	- Understand the concept of change; - Understand positive and negative change; - Understand types of change; - Understand of components of change;
Format	100% Asynchronous
Duration	30 min (Asynchronous Video Lesson) + 1h (Asynchronous Exercises)
Learning Exercises (name)	L1.1: What is Change?
	L1.2: What is the relationship between the concept of change in the Sigmund Curve?
	L1.3. What are the positive and negative aspects of change?
	L1.4. What are the types of change?
	L1.5. What are the benefits of change to the organization?

Learning Exercise 1.1	
Title	What is Change?
Duration	5 minutes

Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 1.2	
Title	What is the relationship between the concept of change in the Sigmund Curve?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students	

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should take back from the exercise?	

Learning Exercise 1.3	
Title	What are the positive and negative aspects of change?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 1.4	
Title	What are the types of change?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	

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Methodology	Asynchronous Session
	• In a word document present the exercise and questions
	• Ask trainees to reflect on the same document and in the end read the conclusions
	• Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 1.5	
Title	What are the benefits of change to the organization?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session
	• In a word document present the exercise and questions
	• Ask trainees to reflect on the same document and in the end read the conclusions
	• Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Lesson 2	
Title	Reason and need for change

Objectives	Understanding the causes and necessity of change
Main Contents	- An overview of change - Management of change - Change levels - The general environment (PESTLE) factors - The specific environment (SCCP) elements - Internal environment of an organization - Driving forces of change; External and internal forces of change - Shift in Trends - Driving forces of change - Sustainable development in an organization - Dynamic competition – innovation competition - Technological changes as the driving force of organizational change
Key Messages	• Understanding an overview of change • Understanding driving forces of change • Understanding technological changes as the driving force of organizational change
Format	100% Synchronous
Duration	30 min (Synchronous Video Lesson) + 1h30 (Asynchronous Exercises)
Learning Exercises (name)	L2.1: Why is change management important to an organization? L2.2: What are the driving forces of change in organizations? L2.3. How do external forces influence organizational change? L2.4. How do internal forces influence organizational change? L2.5. What has changed in airport operations? L2.6. What are the reasons of change in airport operations?

Learning Exercise 2.1	
Title	Why is change management important to an organization?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	

Methodology	
Conclusion: What students should take back from the exercise?	

Learning Exercise 2.2	
Title	What are the driving forces of change in organizations?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	
Conclusion: What students should take back from the exercise?	

Learning Exercise 2.3	
Title	How do external forces influence organizational change?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A

Guidance for the correct development	
Instructions	
Methodology	
Conclusion: What students should take back from the exercise?	

Learning Exercise 2.4	
Title	How do internal forces influence organizational change?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A

Guidance for the correct development	
Instructions	
Methodology	
Conclusion: What students should take back from the exercise?	

Learning Exercise 2.5	
Title	What has changed in airport operations?
Duration	5 minutes
Objectives	

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Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	
Conclusion: What students should take back from the exercise?	

Learning Exercise 2.6	
Title	What are the reasons of change in airport operations?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	
Conclusion: What students should take back from the exercise?	

Lesson 3

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Title	Automation and New Technologies in Airport Operations
Objectives	Understanding what are the Automation and new Technologies and how they should be applied.
Main Contents	- Digital transformation - Usage of New Digital Technologies - Improving customer experience - Key airport procedures for passenger transport - Value chain of airport ground operations - Airport 4.0 technologies - Passenger handling - Baggage handling - Lounge services - Planning and scheduling - Ground support equipment management - HR & training - Barriers to investment in technology - Critical success factors for effective digital transformation
Key Messages	- Understanding digital transformation - Understanding top Priority Technologies in Airports Barriers and success factors for digital transformation
Format	100% Synchronous
Duration	30 min (Synchronous Video Lesson) + 1h30 (Asynchronous Exercises)
Learning Exercises (name)	L3.1: What have been the top priority digital technologies on the journey so far? L3.2: How would you describe the technological development process of airports? L3.3: What have been the top priority digital technologies on the journey so far? L3.4: Which factors can be effective in the success of the digital transformation in airports?

Learning Exercise 3.1	
Title	What have been the top priority digital technologies on the journey so far?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	

Instructions	
Methodology	
Conclusion: What students should take back from the exercise?	

Learning Exercise 3.2	
Title	How would you describe the technological development process of airports?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	
Conclusion: What students should take back from the exercise?	

Learning Exercise 3.3	
Title	What have been the top priority digital technologies on the journey so far?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual

skill-UP

Link (If applied)	N/A

Guidance for the correct development	
Instructions	
Methodology	
Conclusion: What students should take back from the exercise?	

Learning Exercise 3.4	
Title	Which factors can be effective in the success of the digital transformation in airports?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A

Guidance for the correct development	
Instructions	
Methodology	
Conclusion: What students should take back from the exercise?	

Lesson 4	
Title	Planning for Change

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Objectives	Analysing planning for change
Main Contents	- The key principles of successful change management - Identifying the reasons of change - Testing the reasons for change - Change steps - Status determination - Determination of goals - Establishment of change management objectives - Identifying critical stages - Steps of change planning
Key Messages	- Understanding principles of Change Management - Analysing Change Planning - Analysing reasons for change
Format	100% Asynchronous
Duration	30 min (Asynchronous Video Lesson) + 1h30 (Asynchronous Exercises)
Learning Exercises (name)	L4.1: What are the key principles of successful change management? L4.2: What could be the reasons for the need for change? L4.3: What does "status determination" in change mean? L4.4: Why is it important to identify the reason for the change? L4.5: Why should reasons for change be tested? L4.6: What are the steps of change planning?

Learning Exercise 4.1	
Title	What are the key principles of successful change management?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions

	• Ask trainees to reflect on the same document and in the end read the conclusions
	• Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 4.2	
Title	What could be the reasons for the need for change?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 4.3	
Title	What does "status determination" in change mean?
Duration	5 minutes
Objectives	

Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 4.4	
Title	Why is it important to identify the reason for the change?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take	

	back from the exercise?	

Learning Exercise 4.5	
Title	Why should reasons for change be tested?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 4.6	
Title	What are the steps of change planning?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	

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Methodology	Asynchronous Session
	• In a word document present the exercise and questions
	• Ask trainees to reflect on the same document and in the end read the conclusions
	• Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Lesson 5	
Title	Human factors in change management
Objectives	Explaining the effects of human factors on change
Main Contents	• Human beings most important factor • Change management efforts • Employees' fears • Change management efforts fail • Adequate, skilled and equipped human resources • What the organization needs to make sure of for change to happen • Human resources strategy areas
Key Messages	• Human Beings and Change • The Essence of Change: Human • The Role of the Human Factor in the Change Process • The Change and the Human Factor in the Organisations
Format	100% Asynchronous
Duration	30 min (Asynchronous Video Lesson) + 1h30 (Asynchronous Exercises)
Learning Exercises (name)	L5.1: What is the most important factor in change? L5.2: Why most change management efforts fail? L5.3: What must organizations do to bring about change? L5.4: What are the components that affect the human resources strategies of organizations in the change process? L5.5: What is the mistake of management in change? L5.6: Why are employees afraid of change?

Learning Exercise 5.1	
Title	What is the most important factor in change?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 5.2	
Title	Why most change management efforts fail?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions

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	• Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 5.3	
Title	What must organizations do to bring about change?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	96
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 5.4	
Title	What are the components that affect the human resources strategies of organizations in the change process?
Duration	5 minutes
Objectives	

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Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 5.5	
Title	What is the mistake of management in change?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take	

back from the exercise?	

Learning Exercise 5.6	
Title	Why are employees afraid of change?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Lesson 6	
Title	Understanding the resistance to change
Objectives	Analysing resistance to change and resilience
Main Contents	• Resistance • Nature of resistance • Causes of resistance • Factors contributing to resistance • Mechanism underlying resistance: the human side • Resistance: the behavioural elements • Resistance: the cognitive and affective processes • Recognising resistance: the management's challenge • Two types of reactions in the emergence of resistance; Explicit, implicit • Analyse Reasons for Resistance • Methods of Handling Resistance

	• Techniques for Managing Resistance
Key Messages	• Understanding the concept of resistance
	• Evaluating factors contributing to resistance
	• Evaluating mechanism underlying resistance
	• Analysing reducing resistance to change
	• Analysing suggestions for managing resistance to change
Format	100% Synchronous
Duration	30 min (Synchronous Video Lesson) + 1h30 (Asynchronous Exercises)
Learning Exercises (name)	L6.1: Is the nature of resistance positive or negative?
	L6.2: What are the factors that contribute to the formation of resistance to change in organizations?
	L6.3: What kind of elements are effective in people's resistance to change?
	L6.4: Resistance to change can be reduced? How?
	L6.5: Resistance to change in organizations is not inevitable, but how to avoid it?

Learning Exercise 6.1	
Title	Time to recall: Once upon a time;
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Synchronous Session
	• Present the exercise and the questions
	• Give students time to reflect these questions on a written paper
	• Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take	

	back from the exercise?	

Learning Exercise 6.2	
Title	Time to recall: Once upon a time;
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Learning Exercise 6.3	
Title	Time to recall: Once upon a time;
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	

Methodology	Synchronous Session
	• Present the exercise and the questions
	• Give students time to reflect these questions on a written paper
	• Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Learning Exercise 6.4	
Title	Time to recall: Once upon a time;
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Synchronous Session
	• Present the exercise and the questions
	• Give students time to reflect these questions on a written paper
	• Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Learning Exercise 6.5	
Title	Time to recall: Once upon a time;
Duration	5 minutes

Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Lesson 7	
Title	Evaluations of constantly changing and unchanging in airport operations
Objectives	Analysing the constantly changing and unchanging in airport operations
Main Contents	• Airport and airport operations • Landside and airside; operations • Billing and invoicing operations • Information management • Unchanging factors in airport operations • Drivers of change; society, technology, politics, economy, Environment • Changing factors in airport operations • Urbanization and the growth of megacities • Global aging • Middle class growth • Shifting ethnic, political and religious identity • Disability • Health • Technology • Cybersecurity • Robotics and automation • Virtual and augmented reality • New aircraft designs • Environment

	• Infectious disease and pandemics • Economy • Politics
Key Messages	• Understanding airport Operations • Analysing unchanging Factors • Analysing changing Factors • Evaluating consequences of Change
Format	100% Asynchronous
Duration	30 min (Asynchronous Video Lesson) + 1h30 (Asynchronous Exercises)
Learning Exercises (name)	L7.1: What are the types of airport operations? L7.2: What are the parts of the airport? L7.3: What are safety and security differences? L7.4: How did September 11 affect aviation? L7.5: What has changed in the airport with the effect of Covid 19?

Learning Exercise 7.1	
Title	What are the types of airport operations?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions Students must upload their reflection on the platform
Conclusion: What students should take	

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back from the exercise?	

Learning Exercise 7.2	
Title	What are the parts of the airport?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 7.3	
Title	What are safety and security differences?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	

Methodology	Asynchronous Session
	• In a word document present the exercise and questions
	• Ask trainees to reflect on the same document and in the end read the conclusions
	Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 7.4	
Title	How did September 11 affect aviation?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session
	• In a word document present the exercise and questions
	• Ask trainees to reflect on the same document and in the end read the conclusions
	Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Learning Exercise 7.5	
Title	What has changed in the airport with the effect of Covid 19?
Duration	5 minutes
Objectives	

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Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A

Guidance for the correct development	
Instructions	
Methodology	Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions Students must upload their reflection on the platform
Conclusion: What students should take back from the exercise?	

Lesson 8	
Title	Performance Evaluation for Change Management
Objectives	Evaluating change management performance
Main Contents	• Performance • Performance Management • The relationship between change management and performance management • Efficiencies • Profit • Senior management competencies • Senior managers and workforce • Communication • Forms of communication in the organization
Key Messages	• Understanding change management and performance management • Evaluating the meaning of change management for employees • Evaluating the meaning of change management for employers • Evaluating the meaning of performance management for employers • Evaluating the meaning of performance management for employees • Evaluating importance of communication
Format	100% Synchronous

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Duration	30 min (Synchronous Video Lesson) + 1h30 (Asynchronous Exercises)
Learning Exercises (name)	L8.1: What is the relationship between change management and performance management?
	L8.2: What does change management usually mean for employees?
	L8.3: What does change management usually mean for employers?
	L8.4: What does a performance management process successfully implemented and managed in an organization mean?
	L8.5: What is the meaning of performance management for many employees?
	L8.6: What is the importance of communication in change management?

Learning Exercise 8.1	
Title	What is the relationship between change management and performance management?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Learning Exercise 8.2	
Title	What does change management usually mean for employees?
Duration	5 minutes

Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	

Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Learning Exercise 8.3	
Title	What does change management usually mean for employers?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students	

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should take back from the exercise?	

Learning Exercise 8.4	
Title	What does a performance management process successfully implemented and managed in an organization mean?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Learning Exercise 8.5	
Title	What is the meaning of performance management for many employees?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	

Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Learning Exercise 8.6	
Title	What is the importance of communication in change management?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Lesson 9	
Title	Adaptive/innovative solutions for changing environmental

Objectives	Creating adaptive/innovative solutions for changing environmental
Main Contents	- Definitions of innovation and adaptation - Differences of innovation and adaptation - The world aviation evolution - World passenger traffic evolution - Obstacles - Capacity shortfalls - Dissatisfied passengers - Declining aeronautical revenues - Increased competition - Outdated & unreliable IT infrastructure - Changes that the aviation industry needs to adapt to - Smart airport vision - End-to-end passenger journey - Contactless technology - Security – cybersecurity - Mobile check-in - Web check-in - Humanoid robots - Virtual assistance hologram - Self kiosk - Self-service bag drop (SSBD) - New security filters
Key Messages	- Analysing innovation and adaptation - Creating solutions
Format	100% Synchronous
Duration	30 min (Synchronous Video Lesson) + 1h30 (Asynchronous Exercises)
Learning Exercises (name)	L9.1: What are the innovation? L9.2: What are the adaptation? L9.6: What are the cyber?

Learning Exercise 9.1	
Title	What are the innovation?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A

Guidance for the correct development	
Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Learning Exercise 9.2	
Title	What are the adaptation?
Duration	5 minutes
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

Learning Exercise 9.3

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Title	What are the cyber?
Duration	
Objectives	
Type of Exercise	Self-reflection / Individual
Link (If applied)	N/A
Guidance for the correct development	
Instructions	
Methodology	Synchronous Session • Present the exercise and the questions • Give students time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
Conclusion: What students should take back from the exercise?	

8.6 Appendix F – Training Module Curricula "How to Cope with Stress and Change to Fit in Future Roles: Change Adaptability and Stress Management"

Training Module:	How to cope with stress and change to fit in future roles
Partner Responsible:	Deep Blue
Objectives:	- To understand how stress works and how to manage it - To acquire tools and knowledge to better cope with stressful situations - To understand how changes might affect our reactions - To raise personal awareness on our own readiness to change
Audience:	RTC
Duration:	7 hours + 18h (self-study) + 1h post-training assessment
Format:	Online synchronous, in person and asynchronous

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Training Path (S/U/R):	Reskilling and upskilling

Lesson 1	
Title	Stress mechanism and impacts
Objectives	The participants will learn how the stress mechanism works, what are their personal contributing factors (stressors) and the areas of impact (emotional, physical and behavioural)
Main Contents	The stress mechanism the Fight of fly response Signals of stress Personal assessment of stress signals
Key Messages	Stress is an adaptive mechanism and it is important to know how it works. Signals are essential in order to intervene to cope and mitigate on its causes and effects.
Format	asynchronous
Duration	30 minutes
Learning Exercises (name)	N/A

Learning Exercise 1.1	
Title	Assess your signs of stress
Duration	5 minutes
Objectives	To define a personal list of stress signals
Type of Exercise	Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Download the file with the signals' lists and check the boxes whenever you find a signal of stress that you recognise being a frequent reaction of yours under stressful circumstances

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Methodology	Asynchronous Session
	● In a word document present the exercise and the lists
	● Ask trainees to check the boxes whenever they recognise their own reactions from the list
	Students will discuss the outcome in the sync session. No need to upload the file
Conclusion: What students should take back from the exercise?	Trainees should increase "stress-signals" awareness and reflect on their own reactions.

Lesson 2	
Title	Assessing personal stressors
Objectives	The participants will learn the meaning of stressors and they will be asked to self-assess their own in the current situation
Main Contents	Definition of stressors Stressors at work
Key Messages	What is a stressor
Format	Online synchronous
Duration	45 min
Learning Exercises (name)	"Assess your own stressors"

Learning Exercise 2.1	
Title	Assess you own stressors
Duration	20
Objectives	To define a common list of work-related stressors
Type of Exercise	Group exercise
Link (If applied)	N/A

Guidance for the correct development	
Instructions	Group up in a group of 3-4 and define a list of work-related stressors
Methodology	Synchronous Session ● Present the exercise ● Give participants time to come up with a list within their group ● Share the results in a plenary session
Conclusion: What students should take back from the exercise?	This is the first step of a structured exercise. In this phase the goal is to help them to define what a stressor is in their real life.

Lesson 3	
Title	Individual variabilities connected with stress management
Objectives	The participants will understand and apply the criteria of optimism and Locus of control to the stress management.
Main Contents	Individual variabilities Locus of control tips on how to manage LOC
Key Messages	The way we manage situations it depends also on our personal dispositions like optimism, humour and how much we feel the control over the situation. Some of these characteristics are quite stable during a lifetime, others might change due the experiences.
Format	Asynchronous
Duration	30 minutes
Learning Exercises (name)	N/A

Lesson 4	
Title	Tools to manage stressful situations: the circles of change

Objectives	The participants will learn how to apply the "circles of control" techniques to their personal situation. This tool will enable the participants to have a better understanding of what they can change, what they can influence and what they need to accept in the situation they are living.
Main Contents	Circle of control circle of influence, circle of acceptance
Key Messages	In a difficult situation it is important to clarify what are the things we can change, what are the elements we could influence and what we need to accept.
Format	Synchronous in person
Duration	1 h
Learning Exercises (name)	Work related stressors and circle of control

Learning Exercise 4.1	
Title	Assess you own stressors
Duration	20
Objectives	To define a common list of work-related stressors
Type of Exercise	Group exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Group up in a group of 3-4 and define a list of work-related stressors
Methodology	Synchronous Session ● Present the exercise ● Participants will be asked to define in which area (circle) they want to place the work-related stressors and ● Share the results in a plenary session
Conclusion: What students should take back from	Participants will train their abilities to distinguish what can be controlled, influenced and accepted. This is important in order to make more conscious decision and regain control in difficult situations.

the exercise?	

Lesson 5	
Title	Tools to manage stressful situations: Assessing personal resources
Objectives	The participants will learn what are the resources we can use to maximize our stress management. They will self-assess their present resources, the actual and the potential.
Main Contents	Definition of resources examples of resources, the importance of peer support in stress management
Key Messages	To rebalance the heaviness of the demands, it is important to identify and acquire all the resources we need. Some of them are already there (it is important to identify them), some need to be acquired.
Format	Synchronous in person
Duration	30 minutes
Learning Exercises (name)	N/A

Lesson 6	
Title	Tools to manage stressful situations: assessing personal emotional state with the mood meter
Objectives	The participants at the end of this session will know how to self-detect their emotional state using the mood meter tool. They will also be able to understand how their emotional reaction fits in a healthy and functional way with the specific situation they are living.
Main Contents	The RULER model, mentimeter tool, why it is important to self-assess our emotional state in order to regulate it
Key Messages	Emotions are messages to inform us about how we are in a specific moment. They give plenty of information on our level of stress and what is triggering our stress responses. It is vital to recognise them and to take actions when they're sending out warning messages
Format	Synchronous in person
Duration	45 minutes

Learning Exercises (name)	What am I feeling right now?

Learning Exercise 6.1	
Title	What am I feeling right now?
Duration	10 minutes
Objectives	To assess your current emotions/mood
Type of Exercise	Individual exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Place a post it with your name on the emotion/s you are feeling right now and answer to the following questions: ● How do you feel right now? ● What triggered these feelings? ● How do you name these feelings? ● How are you expressing these feelings? ● What emotion-regulation strategies are you using?
Methodology	Synchronous Session ● Present the exercise ● Ask participants to individually answer to the questions ● Ask volunteers for sharing ● Ask the group if they have some reflections to share
Conclusion: What students should take back from the exercise?	Exercising the RULER we become more self-aware of what we feel and how it impacts on our decisions.
Lesson 7	
Title	Coping strategies to better manage the stressful situation
Objectives	The participants will understand the differentiation among short and long coping strategies, they will be able to correctly understand where to proactively apply the most effective one due to the situation.

Main Contents	Long and short term, reactive and proactive coping strategies
Key Messages	Stressful situations might be managed using the adequate coping strategy. The short term are very useful in order to reduce the emotional arousal in the short period and the long term are useful when we need to set up a plan in order to resolve, eliminate or mitigate the impact of stressors
Format	Synchronous in person
Duration	1 h 1/2
Learning Exercises (name)	N/A

Lesson 8	
Title	The curve of change
Objectives	The participants will understand the journey we all do when facing critical changes at work. They will be able to recognise every stage of this path, understand what are the elements that will help them to progress and the ones that will make them regress on early stages of the change management
Main Contents	Resistance to change, the curve of change readiness to change
Key Messages	When we face an unexpected or/and not positive change we can go through some phases. It is important to know that is normal to live different kind of emotions and stages when we live an important change.
Format	Asynchronous
Duration	30 minutes
Learning Exercises (name)	N/A

Lesson 9	
Title	Assess personal readiness to change
Objectives	The goal if this session is to provide participants with a list of personality traits that have an impact on change management and they will self-

	assess themselves onto these dimensions to measure their readiness to change.
Main Contents	Self-assessment and personal development planning
Key Messages	Part of the way we react to change is due to the kind of change and on circumstances. On the other hand, the difference is given by some personal preferences related to change
Format	Online synchronous
Duration	1 h
Learning Exercises (name)	9.1 Questionnaire on Readiness to change + Working on a R.t.C. dimension

Learning Exercise 9.1	
Title	Questionnaire on Readiness to change + Working on a R.t.C. dimension
Duration	30
Objectives	To raise awareness on our readiness to change
Type of Exercise	Group exercise
Link (If applied)	N/A
Guidance for the correct development	
Instructions	Group up in a group of 3-4. Group up with the persons that share a low value on the same dimension of the R.t.C.
Methodology	Synchronous Session • Present the exercise • Give participants time to come up with a list of solutions they can individually implement to train a specific aspect of their readiness to change. • Share the results in a plenary session
Conclusion: What students should take back from the exercise?	To be more aware on their personal dispositions facing changes

8.7 Appendix G – Training Module Curricula "Learning and Practice of New Aircraft Procedures"

Training Module:	Learning and practicing procedures
Partner Responsible:	ENAC
Objectives:	• learn a fictious A320 procedure • train to execute the sequence of corresponding actions and gestures autonomously
Audience:	Pilots (specific)
Duration:	1h (async) + 1h (virtual reality) + 0,3h (assessment in a simulator)
Format:	Asynchronous: self-learning with support material to learn the fundamentals of aircraft controls which are concerned with the procedure as well as principles of actions ordering Virtual reality: training tool specifically developed in order to train to execute the sequence of actions of the procedure with feedback (number of errors and time to execute the procedure) A320 simulator: for the assessment phase
Training Path (S/U/R):	Skilling and Upskilling

Training material 1: Support material	
Title	Fundamentals of A320 controls
Objectives	• remember controls that will be used in the procedure • understand the function of the controls used in the procedure
Main Contents	Description of the controls used in the procedure
Key Messages	-
Format	100% Asynchronous
Duration	1h (Asynchronous)
Learning Exercises (name)	-

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Training material 2: Virtual Reality tool	
Title	Learning a fictious A320 procedure
Objectives	• familiarize with the virtual reality device and the various interaction modes used for each control
Main Contents	• learn the sequence of actions to perform • practice the sequence of actions in order to reduce the number of errors and to speed up the execution of actions
Key Messages	-
Format	Virtual reality tool. Three modes are available: • "discovery mode": the written procedure is shown in the view (without hiding the cockpit) and each element to check or modify is systematically shown through an illuminated path and a halo light • "learning mode": the elements are no longer highlighted. When a correct/erroneous action is executed, the system delivers an auditory feedback • "expert mode": the written procedure is hidden, and the learner has to execute the procedure autonomously After the last step of the procedure, the learner will receive a summary feedback comprising the total number of errors and the total time used to execute the procedure
Duration	1h (20' familiarization + 40' learning the procedure)
Learning Exercises (name)	-

Assessment in a A320 simulator	
Title	Executing the A320 procedure
Objectives	• assessing the retention of the learnt procedure the day after the learning session
Main Contents	• execution of the procedure in a A320 simulator • recording of errors and execution time
Key Messages	-
Format	A320 flight simulator
Duration	20 minutes
Learning Exercises (name)	-

8.8 Appendix H – Training Module Curricula "Managing myself: towards a safer life": Workload Management & Stress Management

Training Module:	Managing myself: towards a safer life
Partner Responsible:	QSR and APANT
Objectives:	• Understand workload and stress management concepts and their role in a safer work-life balance • Understand the different strategies of workload and stress management • Apply workload and stress management tools in daily life
Audience:	RPA pilots
Duration:	6h (sync/assync) + 19h (self-study) + 1h post-training assessment
Format:	Synchronous moments (this is, video conference lessons with a trainer) to stimulate communication among participants Asynchronous moments (self-learning with a set of support materials) to allow the completion of the course at one's pace Practical case studies throughout the course
Training Path (S/U/R):	Skilling and Upskilling

Lesson 1	
Title	Workload and Stress Management: Why do I need them to be safe?
Objectives	Understanding the concept of workload management and stress management
Main Contents	• Introduction • "But, after all, what is stress?": Concept definition • "To whom it affects?": Explore stressful situations • "How does it affect?": Physiological, behavioural and psychological symptoms • "Is it a threat or a challenge?": Demystifying the role of stress • "So how can we use it in our favor?": Introduction to the possibility of managing stress • "Stress Management": Introduction for Lesson 2, theoretical presentation of stress management strategies as ABC and 4 A's. • "Workload Management as an enabling tool": Introduction to workload management, its connection with stress and application as a tool to prevent stress

Key Messages	• Understand the positive role of stress in our personal and professional lives; • Understand stress can be managed; • Understand the connection between stress management and time/tasks management;
Format	100% Asynchronous
Duration	30 min (Asynchronous Video Lesson) + 1h30 (Asynchronous Exercises) + 6,33H (Homework)
Learning Exercises (name)	L1.1: Time to recall: Once upon a time; L1.2: Time to recall: Once upon a time;

Learning Exercise 1.1	
Title	Time to recall: Once upon a time…
Duration	30 minutes
Objectives	• Understand stress is a consequence of our interpretation of the situation • Understand it's possible to manage stressful situations
Type of Exercise	Self-reflection / Individual
Link (if applied)	N/A
Guidance for the correct development	
Instructions	Recall a recent situation when you felt stressed. It could be the proximity of a deadline, a broken computer, a presentation to an unfamiliar audience... any situation that, for you, has caused you anxiety. • Recall the incident as clearly as possible. What ideas and thoughts crossed your mind at the time? • Did you feel angry? Did you blame yourself for the outcome of the situation? Feeling unintelligent in the way you handled it? • Did you feel anxious or stressed? • Did you avoid the situation? If so, did you told yourself: can't I take it anymore? • Did these thoughts help you deal with the situation, calm you down, or stress you more?
Methodology	Synchronous Session • Present the exercise and the questions • Give trainees time to reflect these questions on a written paper • Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise

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	Asynchronous Session ● In a word document present the exercise and questions ● Ask trainees to reflect on the same document and in the end read the conclusions ● Trainees must upload their reflection on the platform
Conclusion: What trainees should take back from the exercise?	Often, after analysing a situation that triggers stress, we realize that it was our thoughts that made the situation worse, conditioning our action / reaction. We are the ones who call a situation, that we didn't expect to find, a problem. Problems are not things, but how we interpret them. So, it is possible to manage stress, even using it as an enhancer.

Learning Exercise 1.2	
Title	Time to recall: Once upon a time…
Duration	30 minutes
Objectives	● Understand the importance of self-knowledge ● Understand how to analyze a situation in order to change it
Type of Exercise	Self-reflection / Individual
Link (if applied)	N/A
Guidance for the correct development	
Instructions	Recall a recent situation when you felt stressed. An unforeseen situation, in which you believe you don't have the resources to cope. ● What do I say is happening? (Facts and non-assessment, analyze the situation) ● What do I want to happen? (Remember original priorities, am I willing to change, or am I forever advocating a single method? Do I want to be right, or do I want results?) ● How could I transform what is happening into an opportunity? (There are always other possible interpretations)
Methodology	Synchronous Session ● Present the exercise and the questions ● Give trainees time to reflect on these questions on a written paper ● Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise Asynchronous Session

	- In a word document present the exercise and questions - Ask trainees to reflect on the same document and in the end read the conclusions - Trainees must upload their reflections on the platform
Conclusion: What trainees should take back from the exercise?	Remember that the right way to break the barriers that inhibit action, always passes by yourself, your self-analysis and recognition of the emotions that narrow you. Start by discovering what causes you stress, then assess the stressors, understand how you can respond to them and put yourself in control of the situation. For that to happen you must apply all the tools that fit yourself in that moment. Commit to action, learn with the mistakes you made, become the best version of yourself. At the end, don't forget: benchmark your progress.

Lesson 2	
Title	So much to do, and so little time: How to manage my work
Objectives	Understanding and implementing strategies for workload management
Main Contents	- Introduction "What: Who you are": Self-knowledge about self-potential "Why: What is your purpose": Defining personal goals and targets "How: What you can do to achieve your goals": Establishing successful habits and applying a positive routine
Key Messages	- Understand the consequences of poor workload management in personal, social and professional life - Understand workload management habits; - Understand how to apply small habits in personal routines to improve productivity in work
Format	25% Asynchronous + 75% Synchronous
Duration	30 min (Asynchronous Video Lesson) + 1h30 (Synchronous Exercises) + 6,33H (Homework)
Learning Exercises (name)	L2.1: Time to recall L2.2: Roll up your sleeves L2.3: Put it into practice L2.4: Analyse your day

Learning Exercise 2.1	
Title	Time to recall
Duration	10 minutes
Objectives	Understand the importance of managing time

	• Understand the consequences of working longer hours
Type of Exercise	Self-reflect
Link (if applied)	N/A

Guidance for the correct development

Instructions	Do you recall what happens when you work longer hours?
Methodology	Synchronous Session • Present the exercise and the questions • Give trainees time to reflect on the question on a written paper • Encourage sharing their personal reflections and thinking of other consequences besides the ones presented. Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Trainees must upload their reflections on the platform
Conclusion: What trainees should take back from the exercise?	For most individuals, managing tasks, and the time spent doing them, is the most difficult thing to accomplish during their working day. Some people work 12- to 14-hour days, feeling perpetually exhausted and at the end of the day, they find it very difficult to fully engage with their families or have a social life that fulfils them. Let us tell you a secret: If it seems to you that you never have enough time to accomplish your tasks and deadlines, the problem is not the time itself, but the way you spent it on each task.

Learning Exercise 2.2	
Title	Roll up your sleeves
Duration	15 minutes
Objectives	• Understand the importance of self-knowledge • Understand and distinguish between personal beliefs and facts
Type of Exercise	Self-reflect
Link (if applied)	N/A

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Guidance for the correct development	
Instructions	Apply the first strategy we propose, start by answering these questions. ● What are your prevailing beliefs? ● What are the facts behind those beliefs? ● Deconstruct them and start to understand your personal success routine.
Methodology	Synchronous Session ● Present the exercise and the questions ● Give trainees time to reflect on these questions on a written paper ● Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise Asynchronous Session ● In a word document present the exercise and questions ● Ask trainees to reflect on the same document and in the end read the conclusions ● Trainees must upload their reflections on the platform
Conclusion: What trainees should take back from the exercise?	Any successful project begins when you realize your beliefs, your abilities, your skills, the stage you are in now and what changes you can make to be a better person. Realize your potential, take responsibility for your actions and manage your day with confidence.

Learning Exercise 2.3	
Title	Put it into practice
Duration	15 minutes
Objectives	● Defining personal Eisenhower Matrix ● Apply the personal Eisenhower Matrix to the week plan ● Distinguish between an Urgent task and an Important task
Type of Exercise	Individual
Link (if applied)	N/A
Guidance for the correct development	
Instructions	Now, it is time to put it into practice. Start to design your Eisenhower Matrix, applying it to your week plan.

Methodology	Synchronous Session
	• Present the exercise
	• Give trainees time to reflect and complete on the exercise
	• Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise
	Asynchronous Session
	• In a word document present the exercise and questions
	• Ask trainees to reflect on the same document and complete the exercise
	• Trainees must upload their exercises on the platform
Conclusion: What trainees should take back from the exercise?	A good time management and organization plan should be designed considering your priorities. Remember: An Important Task is a useful and essential activity for achieving goals. On the other hand, an Urgent Task will already be an activity with an immediate deadline.

Learning Exercise 2.4	
Title	Analyse your day
Duration	30 minutes
Objectives	• Analyse personal day • Understand personal habits and routines in life
Type of Exercise	Self-reflection / Individual
Link (if applied)	N/A
Guidance for the correct development	
Instructions	You were presented with some strategies, facilitating time management. We challenge you to take some of your time and analyze your day-to-day. • How is your sleep routine? And your food? Do you practice exercise? • Create new success habits, including them in your daily schedule.
Methodology	Synchronous Session • Present the exercise and the questions • Give trainees time to reflect on these questions on a written paper

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	• Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Trainees must upload their reflections on the platform
Conclusion: What trainees should take back from the exercise?	Realize that your inner narrative dictates your potential. So, try to focus on projects that are closer to your goals. Try to simplify your day as much as possible, structuring it according to what you want to achieve.

Lesson 3	
Title	Feeling Stressed: Why, when and how to cope with it
Objectives	Understanding the basic stress triggers, signs and coping strategies
Main Contents	• "Feeling stressed – Why and when" • "Feeling stressed – how to cope with it"
Key Messages	• Understand the sources and reasons behind stress in personal workplace • Understand strategies and steps to prevent stressful situations;
Format	25% Asynchronous + 75% Synchronous
Duration	30 min (Asynchronous Video Lesson) + 1h30 (Synchronous Exercises) + 6,33H (Homework)
Learning Exercises (name)	L3.1: Time to recall L3.2: Analyse your day

Learning Exercise 3.1	
Title	Time to recall
Duration	10 minutes
Objectives	• Understand the difference between productivity and performance
Type of Exercise	Self-reflect
Link (if applied)	N/A

Guidance for the correct development	
Instructions	What is the difference about performance and productivity? Give an example to illustrate this difference.
Methodology	Synchronous Session • Present the exercise and the questions • Give trainees time to reflect on the question on a written paper • Encourage sharing their personal reflections and thinking of different examples Asynchronous Session • In a word document present the exercise and questions • Ask trainees to reflect on the same document and in the end read the conclusions • Trainees must upload their reflections on the platform
Conclusion: What trainees should take back from the exercise?	Productivity is influenced by the way we manage stress and how we deal with the pressure resulting from the increase in the volume of work. The performance, however, is something permanent, which will take place 24 hours a day / 7 days a week, and it will incorporate several variables that will influence the result. These variables such as sleep routine, diet, sedentary life vs physical exercise and others that will interfere with our daily behaviour. We will not be able, however, to avoid certain moments when our productivity is affected. To this end, we must understand what influences the loss of productivity by developing strategies that can be applied to these same moments.

Learning Exercise 3.2	
Title	Analyse your day
Duration	30 minutes
Objectives	• Understand and identify moments of stress • Understand if there is similar events or situations that are more stress inducing • Reflect on those situations and on how to make them less stress inducing
Type of Exercise	Self-reflect

Link (if applied)	N/A

Guidance for the correct development	
Instructions	Analyse your day-to-day. Remember the past week and identify the moments that have induced your stress. Fill in all your fields: ● Situation – describe the stress-inducing situation; ● Reaction – identify your reaction to it (emotional, cognitive and physical reactions). ● Intensity – rank on a scale of 1 to 5, in which five means inhibitory to action (freeze mode). <table><tr><th>Situation</th><th>Reaction</th><th>Itensity</th></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>
Methodology	Synchronous Session ● Present the exercise and the questions ● Give trainees time to reflect on the question on a written paper ● Encourage sharing their personal reflections, the similarities and differences and which lessons can be taken from the exercise Asynchronous Session ● In a word document present the exercise and questions ● Ask trainees to reflect on the same document and in the end read the conclusions ● Trainees must upload their reflections on the platform
Conclusion: What trainees should take back from the exercise?	As stress is a completely individualized phenomenon, we know that it is impossible to predict accurately all of our possible reactions, to all possible occurrences. However, the more you get to know yourself, the more likely you are to anticipate the problem and the more easily you will be able to control the situation.

8.9 Appendix I - Graphics of the "How to Cope with Stress and Change to Fit in Future Roles: Change Adaptability and Stress Management" (SM #02) trainees
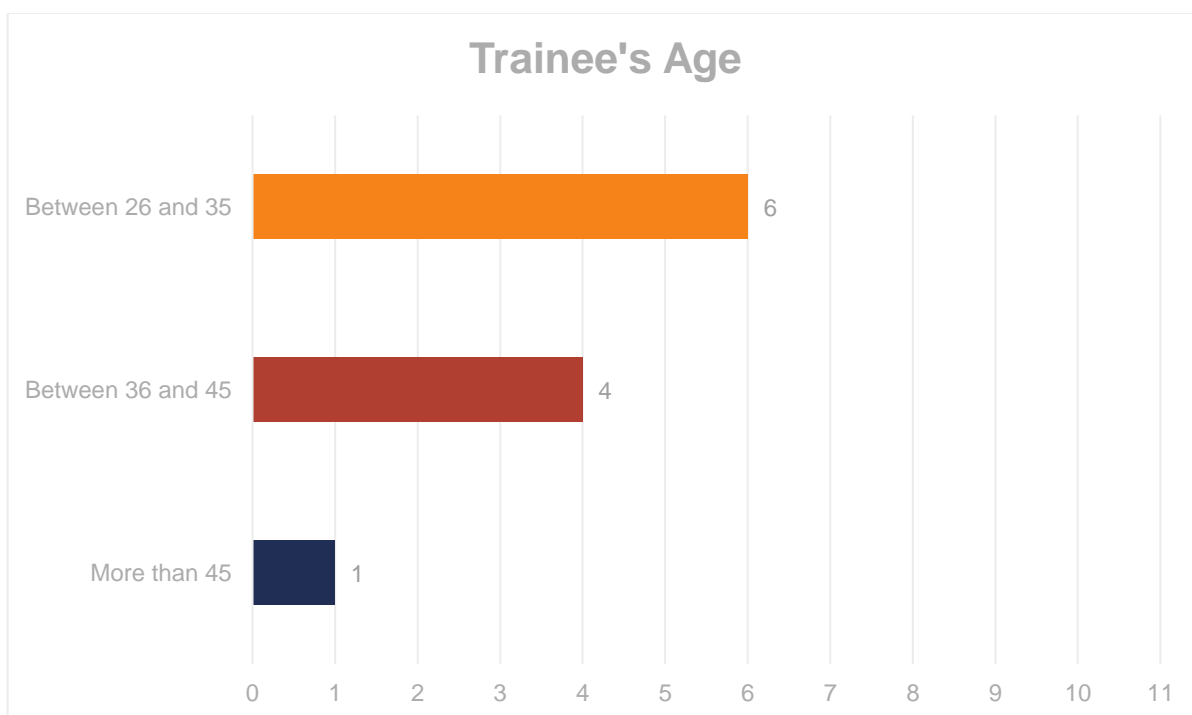
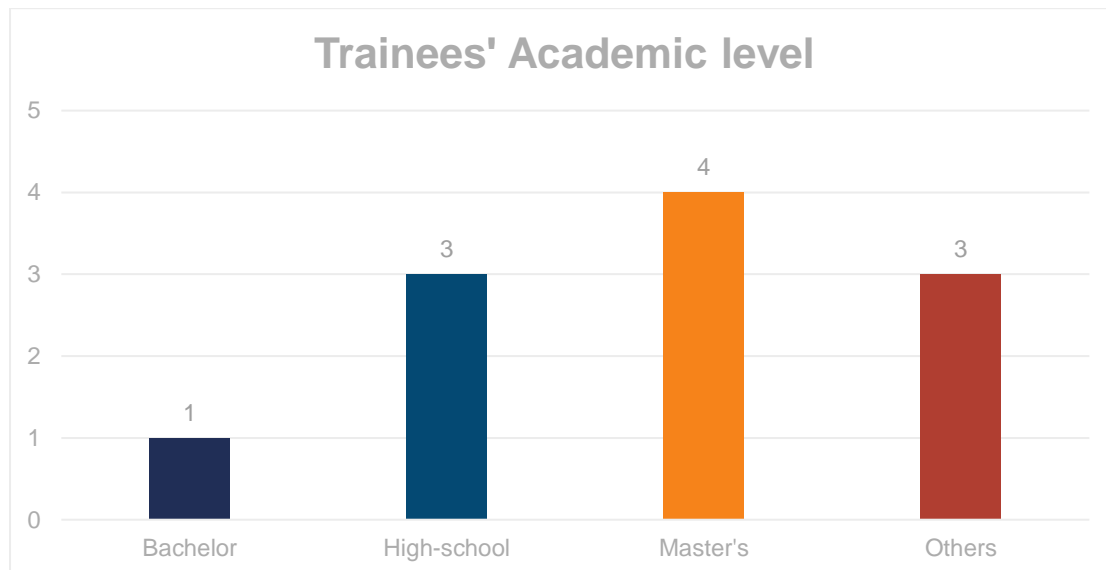

Figure 17 - Graphic with the age of the SM #02 trainees

Figure 18 - Graphic with the academic level of the SM #02 trainees
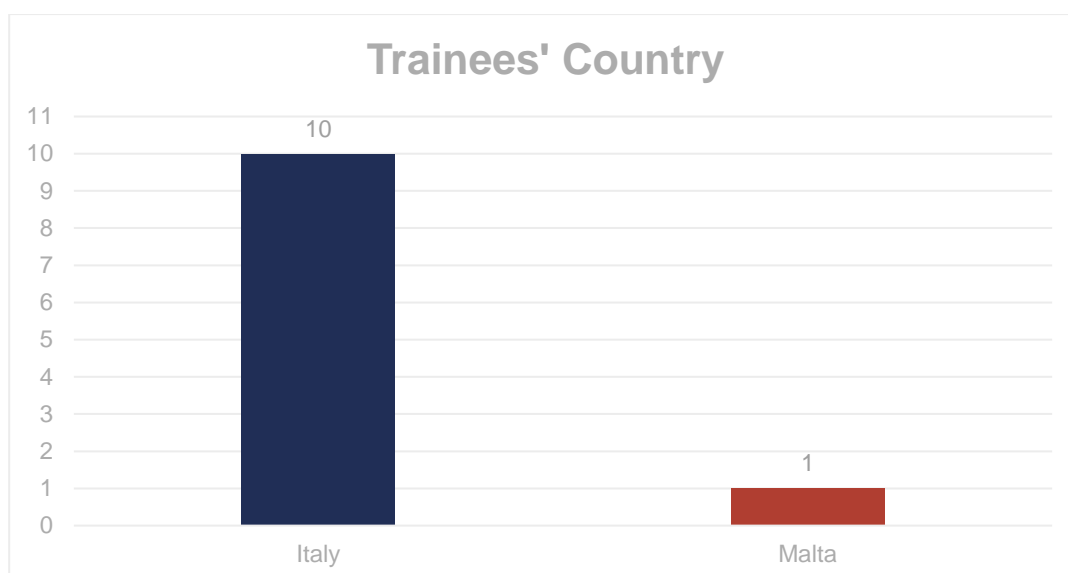
Trainees' Country

Figure 19 - Graphic with the country of the SM #02 trainees

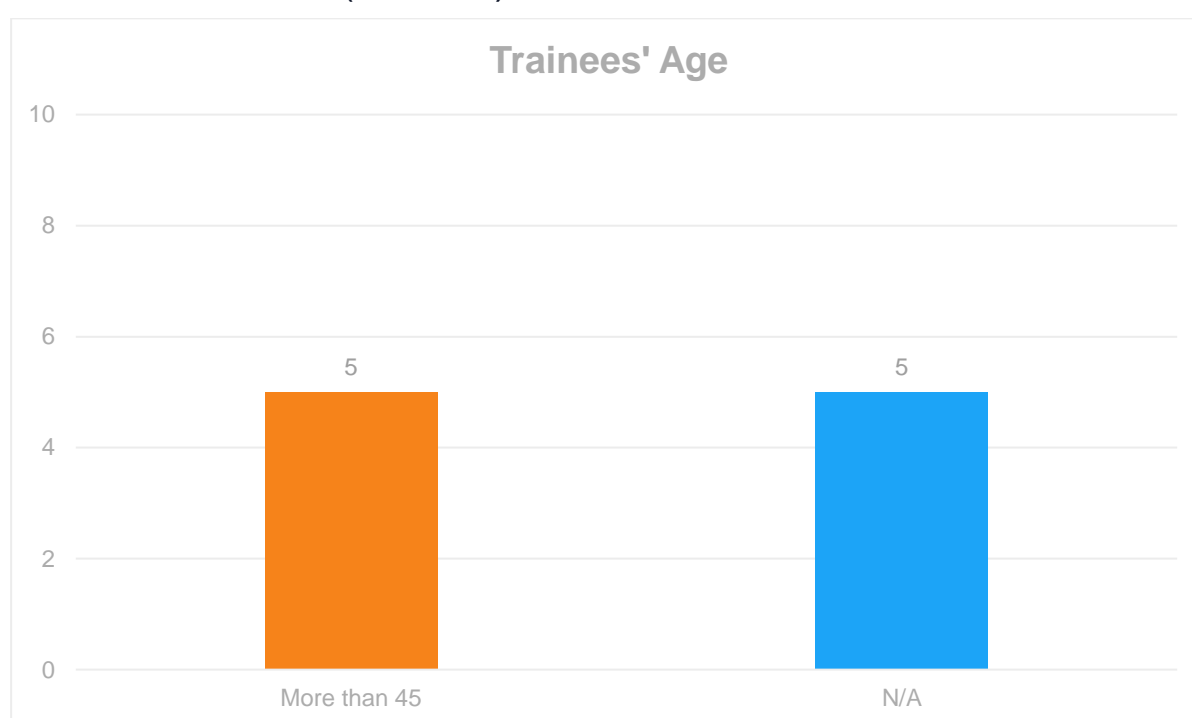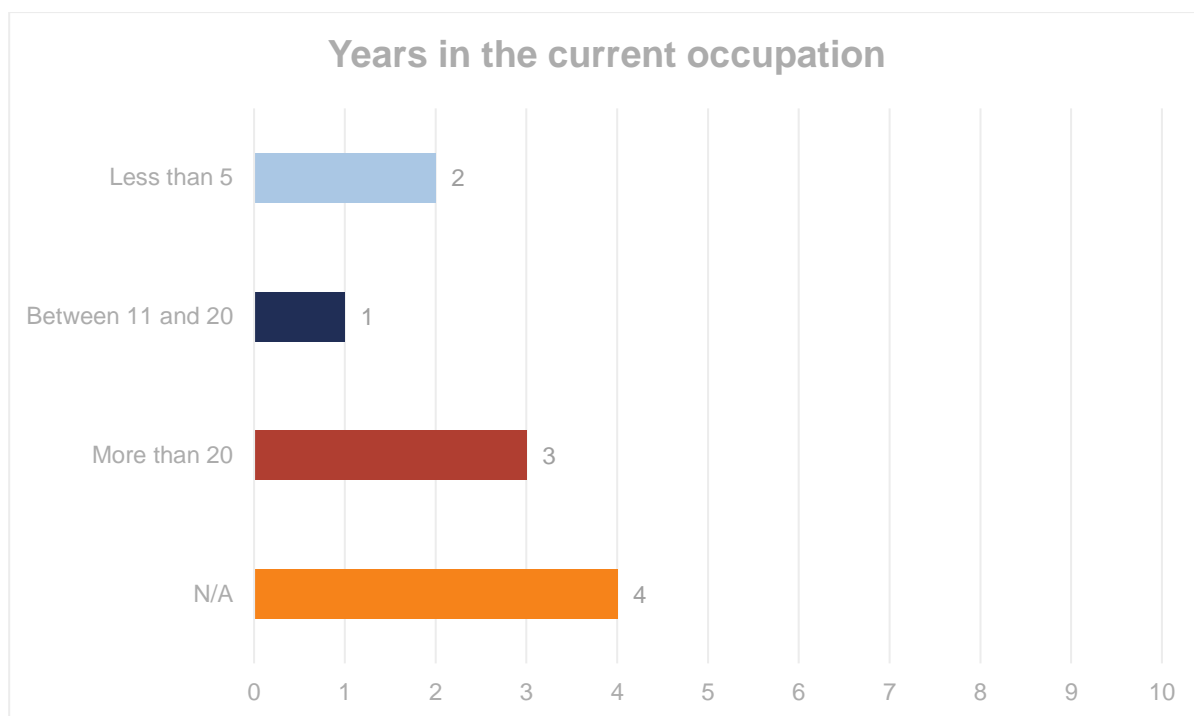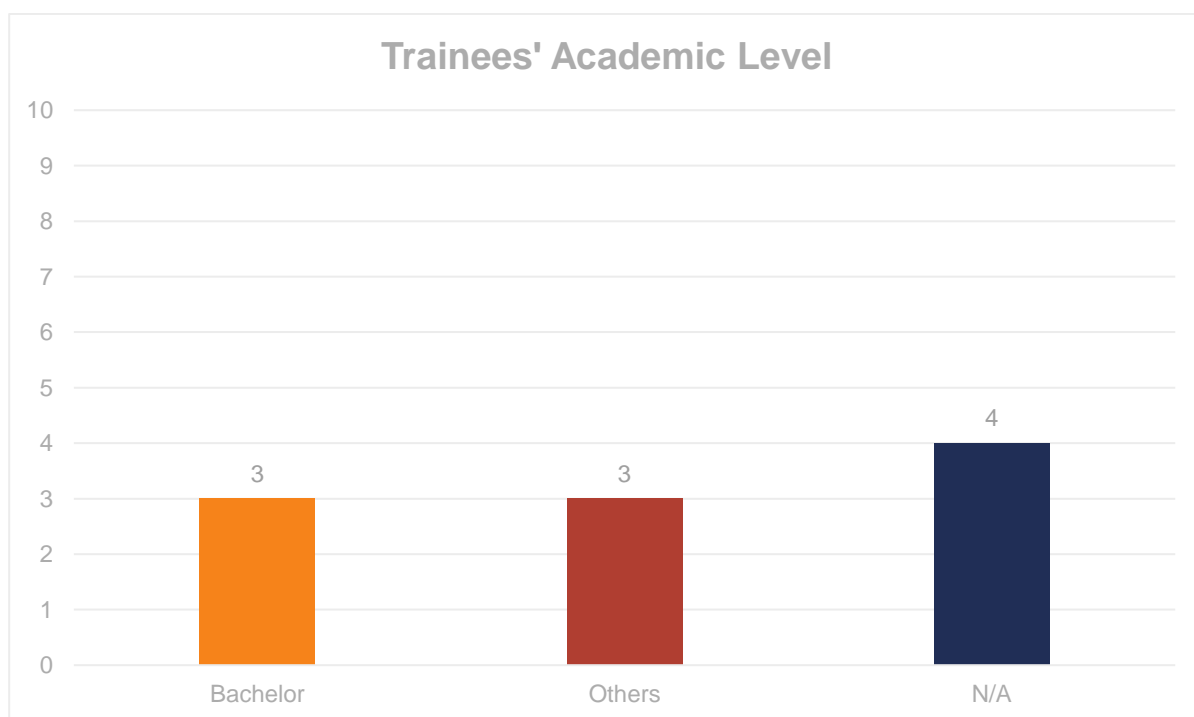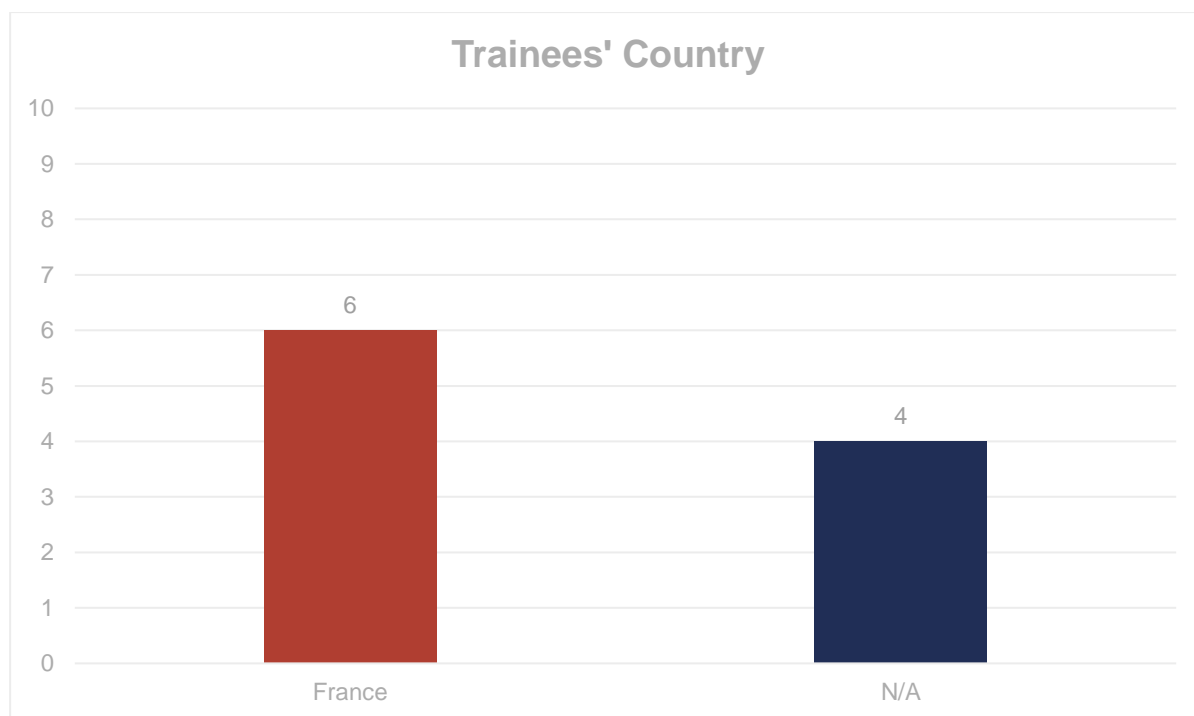## 8.10 Appendix J - Graphics of the "Deepening of Situation Awareness" (TM#03) trainees

Trainees' Age

Figure 20 - Graphic with age of the TM#03 trainees

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Years in the current occupation

Category	Value
Less than 5	2
Between 11 and 20	1
More than 20	3
N/A	4

Figure 21 - Graphic with the years of occupation of the TM#03 trainees

Trainees' Academic Level

Bachelor	Others	N/A
3	3	4

Figure 22 - Graphic with the academic level of the TM#03 trainees

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Trainees' Country

Figure 23 - Graphic with the country of the TM#03 trainees

Comfort with English
(1 - not comfortable at all; 5 - completely comfortable)
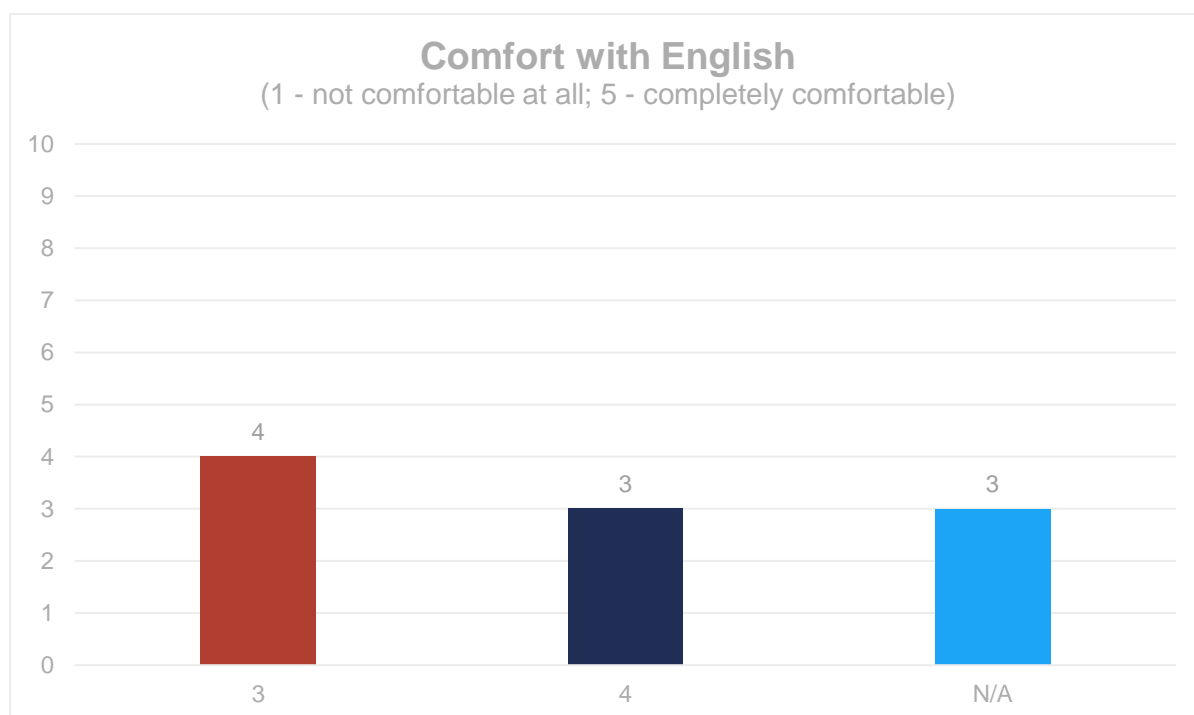
Figure 24 - Graphic with the level of comfort with English of the TM#03 trainees

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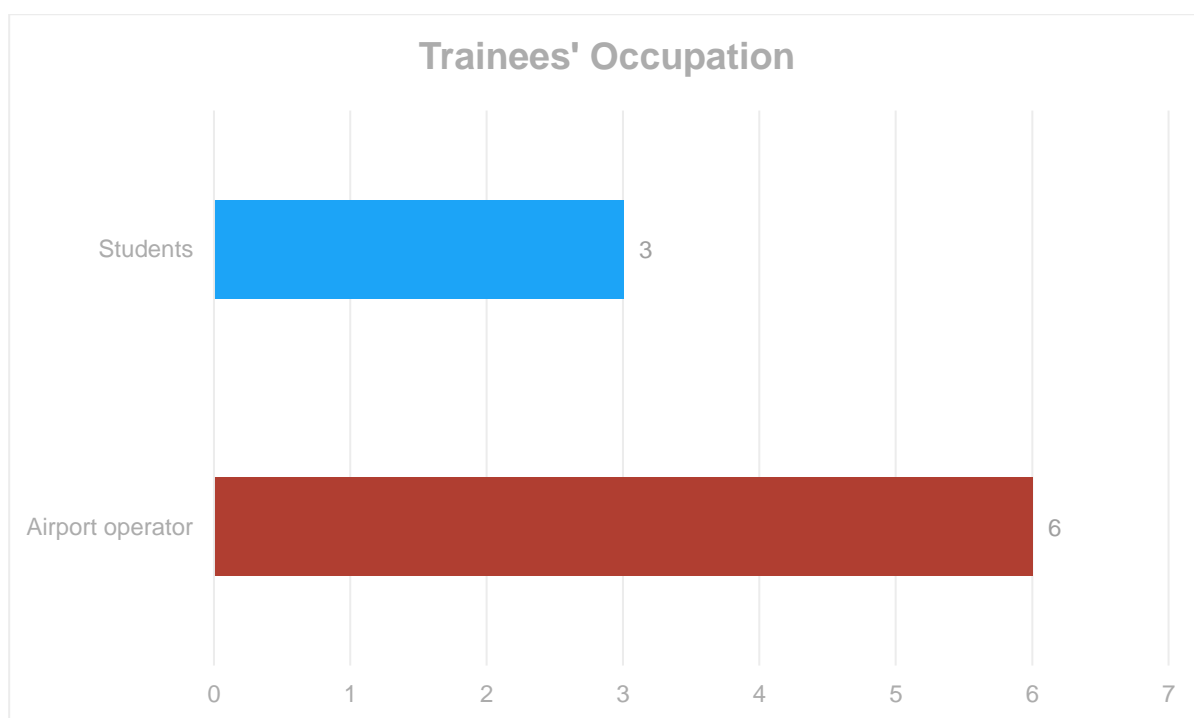## 8.11 Appendix K – Graphics of the "Change Management for Automation and Emerging Technologies" (SM #01) trainees

Figure 25 - Graphic with the trainees' current occupation on the SM #01
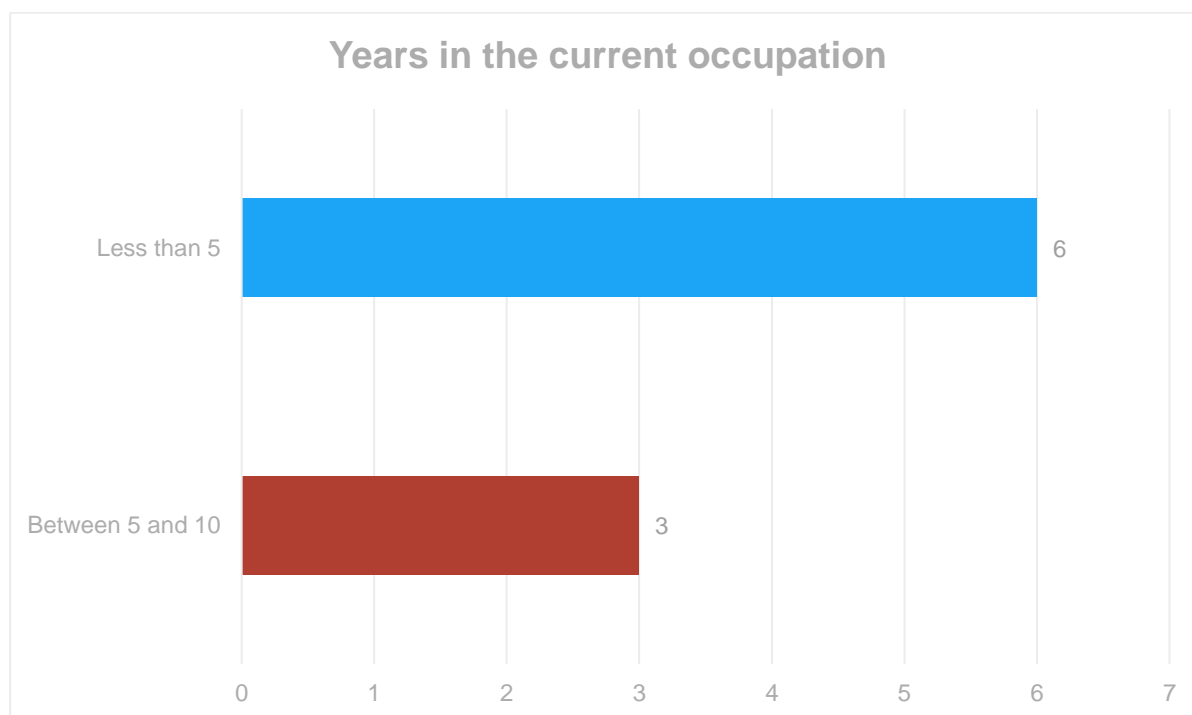
Figure 26 - Graphic with the years of occupation of the SM #01
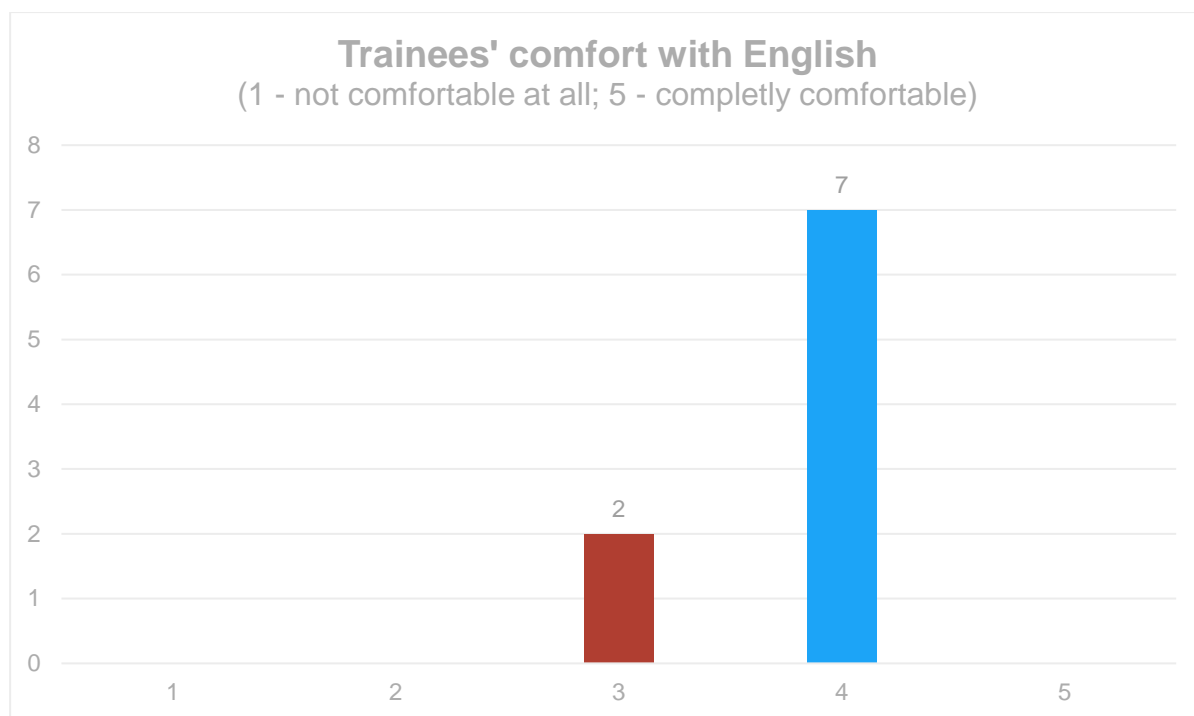
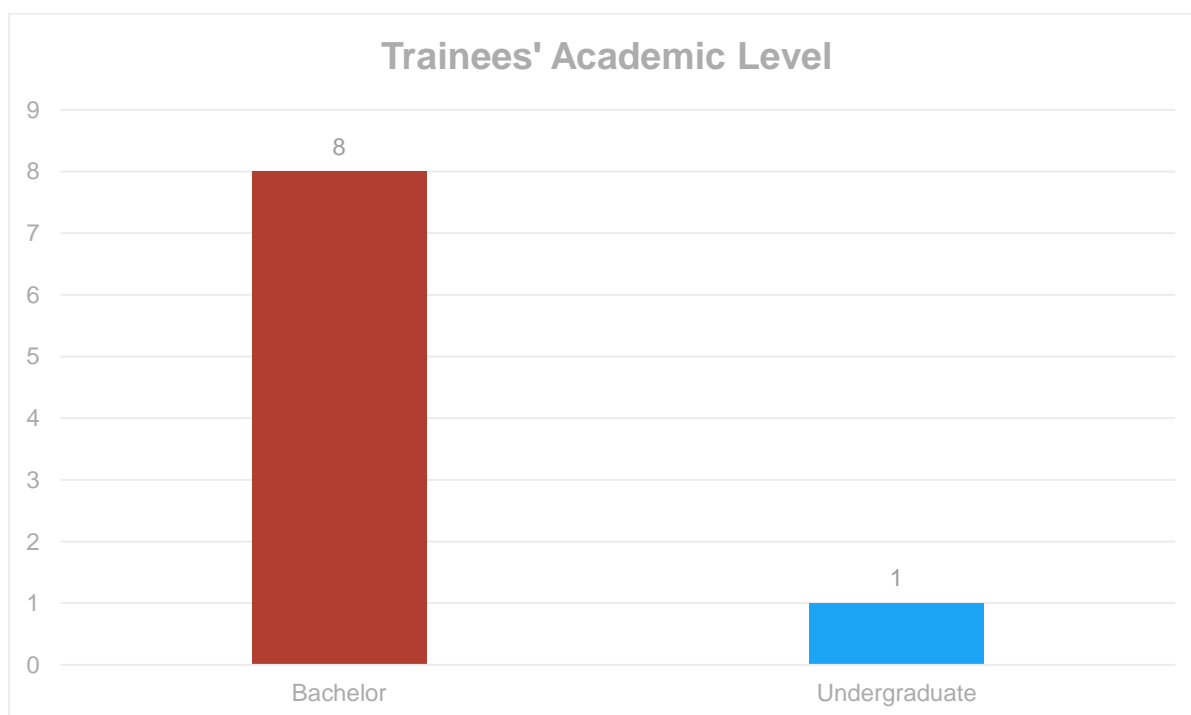**Figure 27 - Graphic with the level of comfort with English of the SM#01 trainees**

Figure 28 - Graphic with the academic level of the trainees for the SM #01

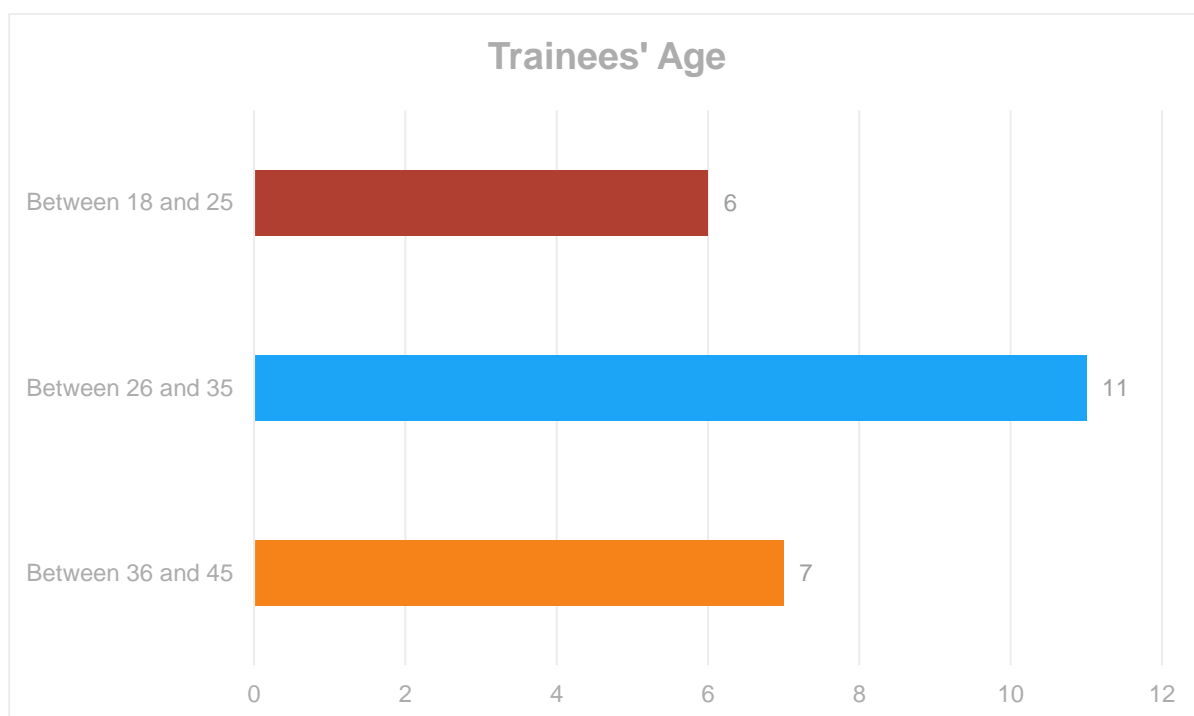## 8.12 Appendix L – Graphics of the "Strengthening Psychological Capital" (TM #04) trainees

Trainees' Age

Age	Value
Between 18 and 25	6
Between 26 and 35	11
Between 36 and 45	7

Figure 29 - Graphic with age of the TM#04 trainees

Years in the current occupation

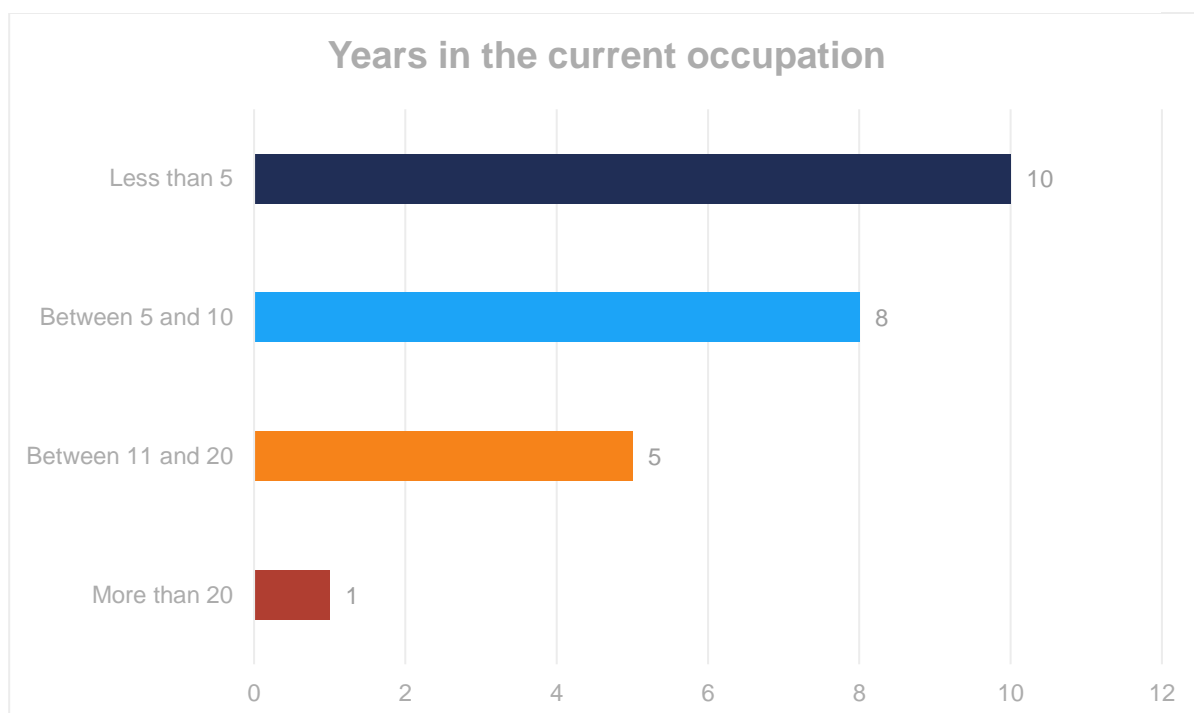| Years	Value
Less than 5	10
Between 5 and 10	8
Between 11 and 20	5
More than 20	1

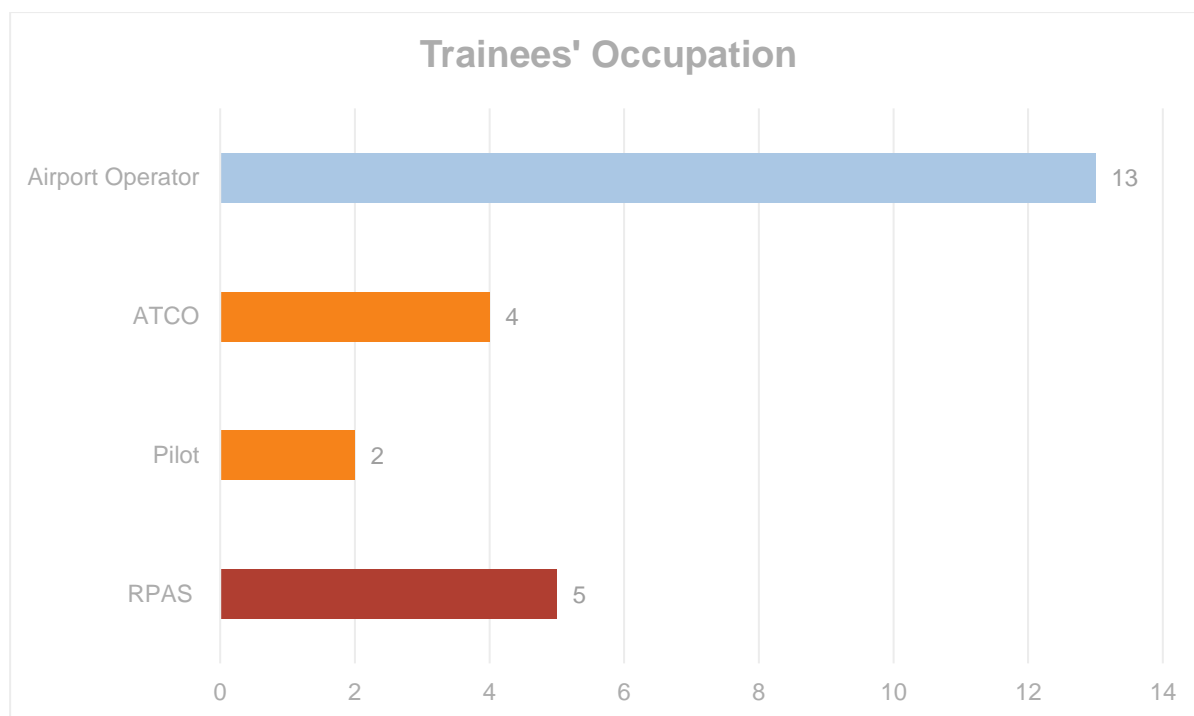**Figure 30 - Graphic with the years of occupation of the TM#04 trainees**

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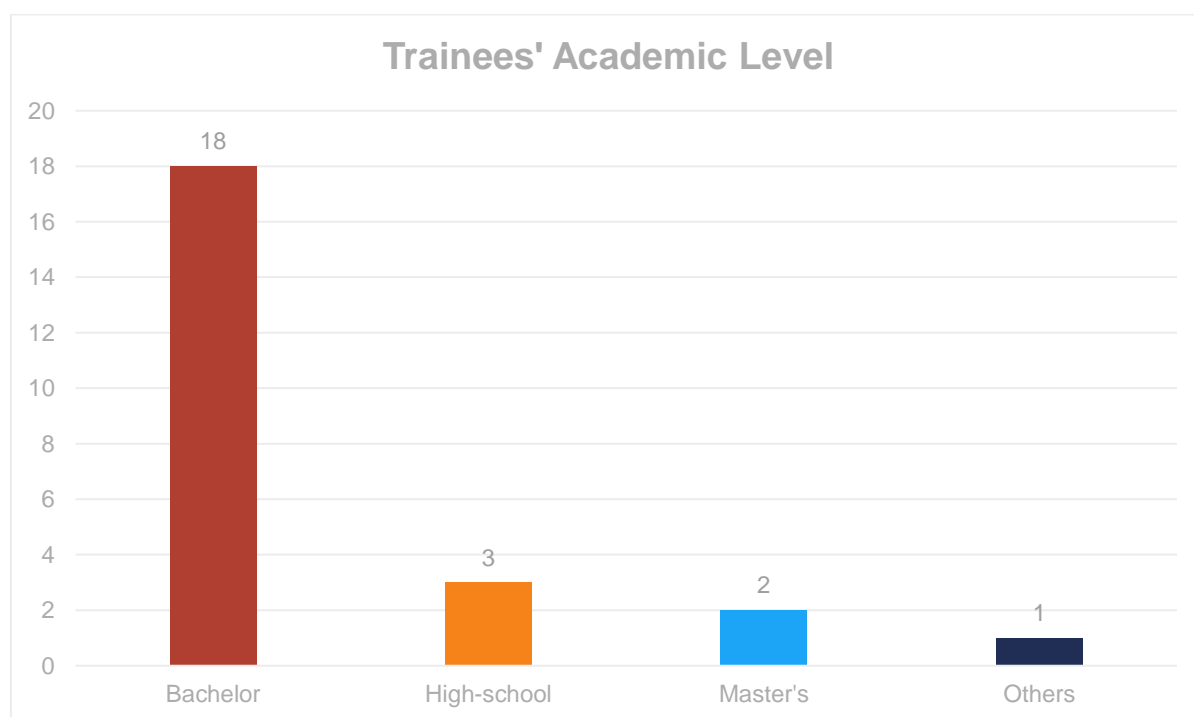**Figure 31 - Graphic with the occupation of the TM#04 trainees**

Figure 32 - Graphic with the academic level of the TM#04 trainees

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8.13 Appendix M – Graphics of the "Houston, we have a problem: Problem-solving & Decision-making" (TM#01) trainees

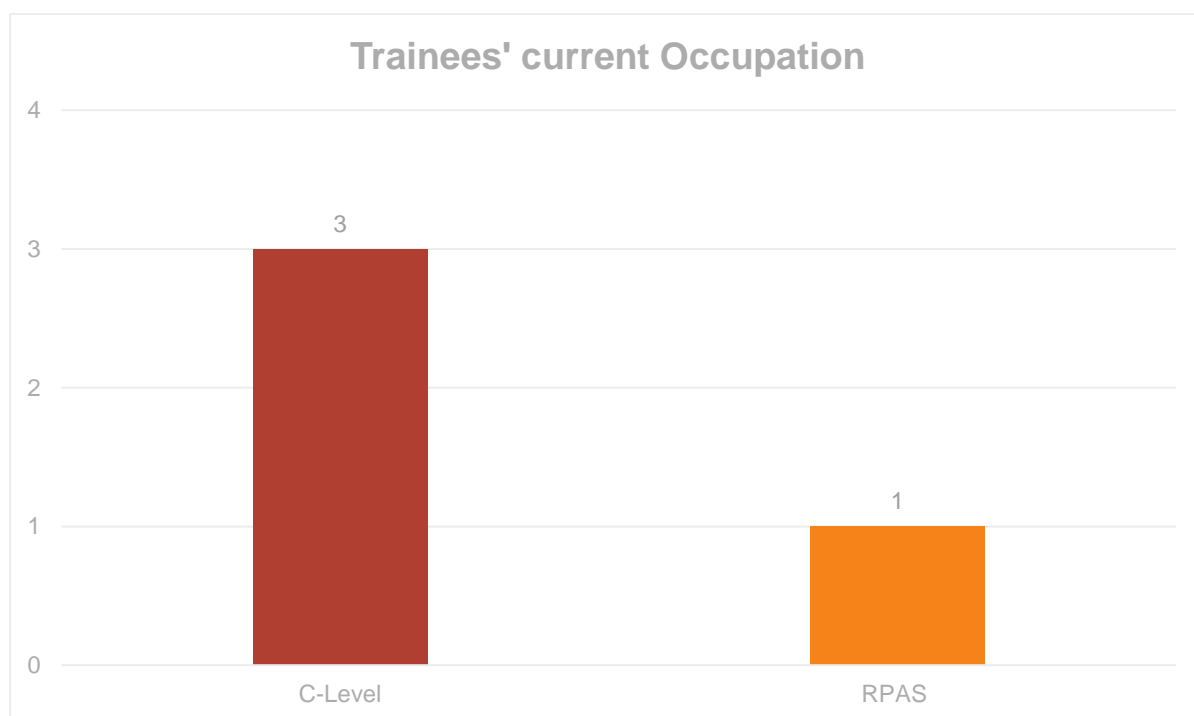**Trainees' current Occupation**

Figure 33 - Graphic with the current occupation of the TM#01 trainees

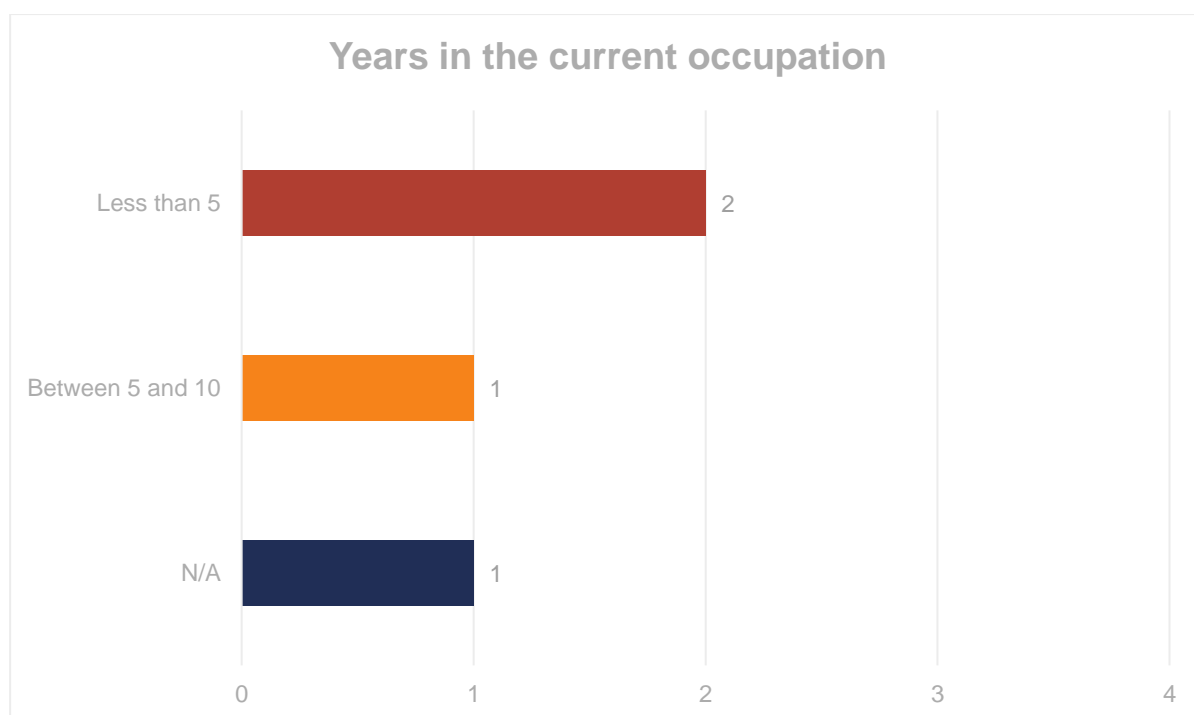**Years in the current occupation**

Figure 34 - Graphic with the years in the current occupation of the TM#01 trainees
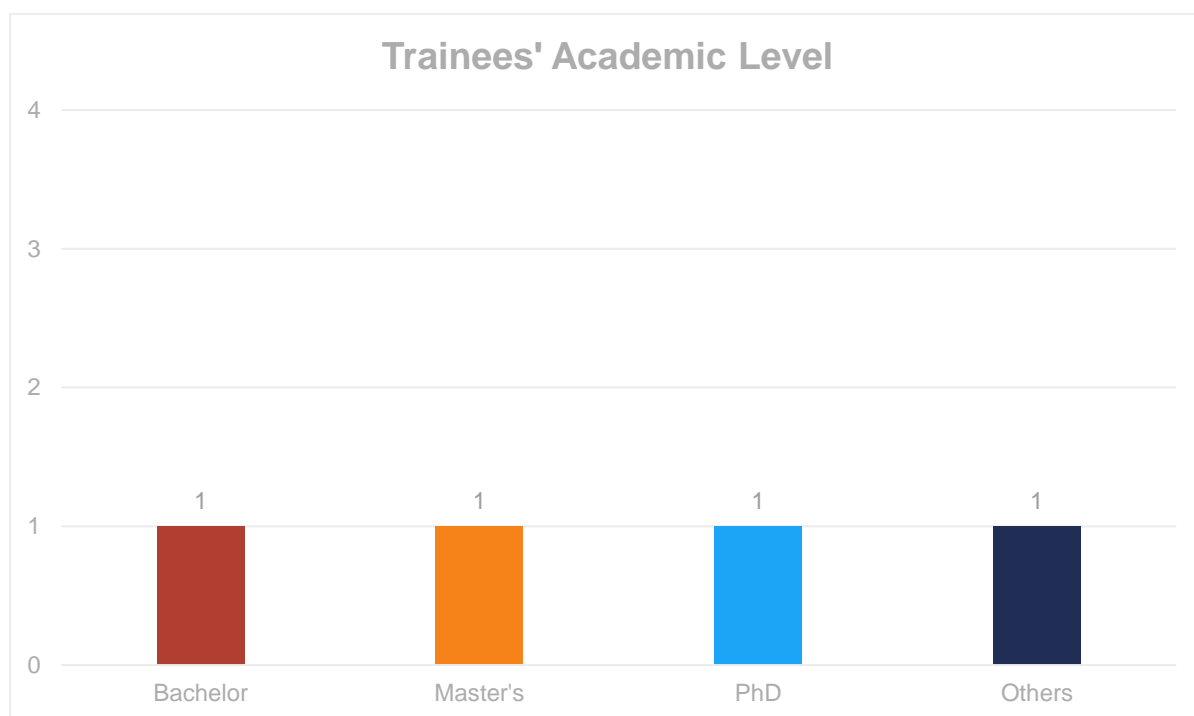
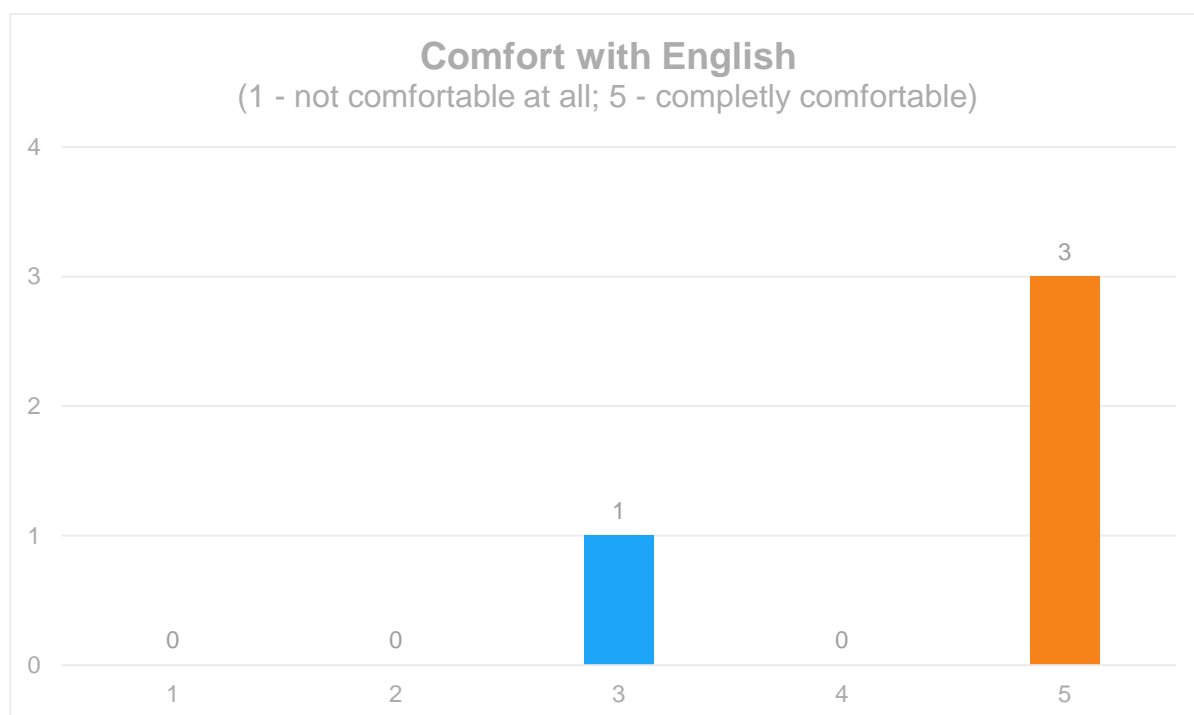**Figure 35 - Graphic with the academic level of the TM#01 trainees**

Figure 36 - Graphic with the level of comfort with English level of the TM#01 trainees

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8.14 Appendix N – Graphics of the "Managing myself: towards a safer life": Workload Management & Stress Management (SM #04) trainees
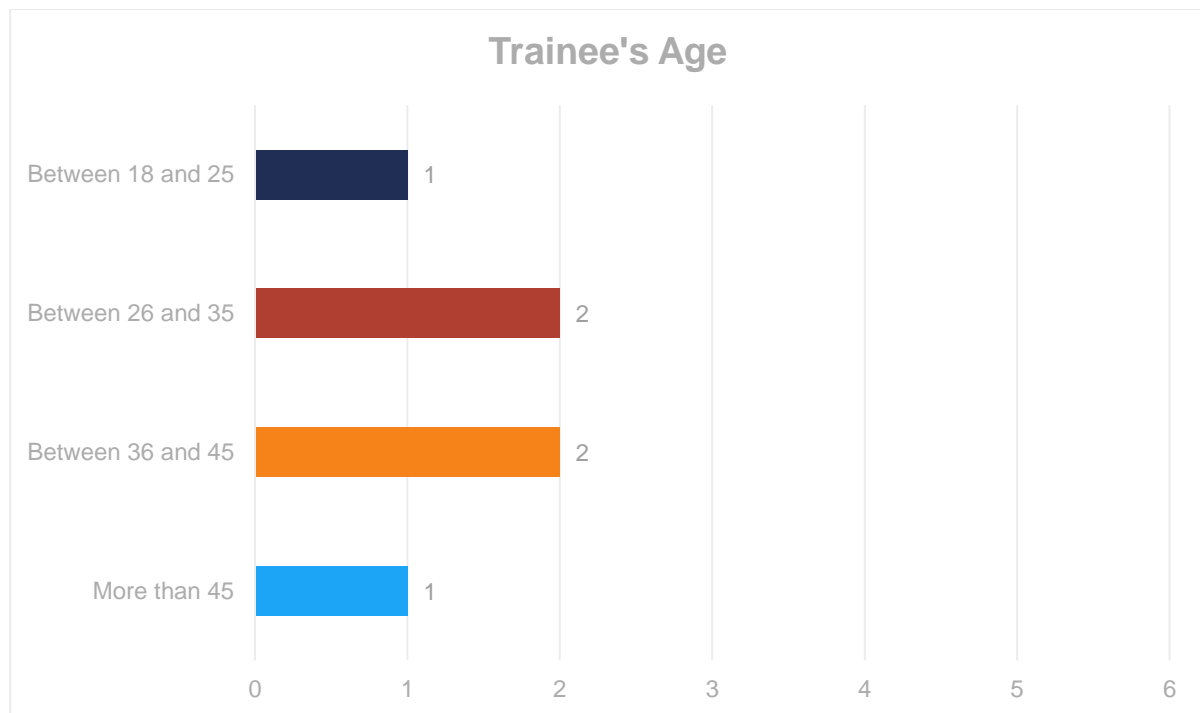
Trainee's Age

Figure 37 - Graphic with the age of the SM #04 trainees
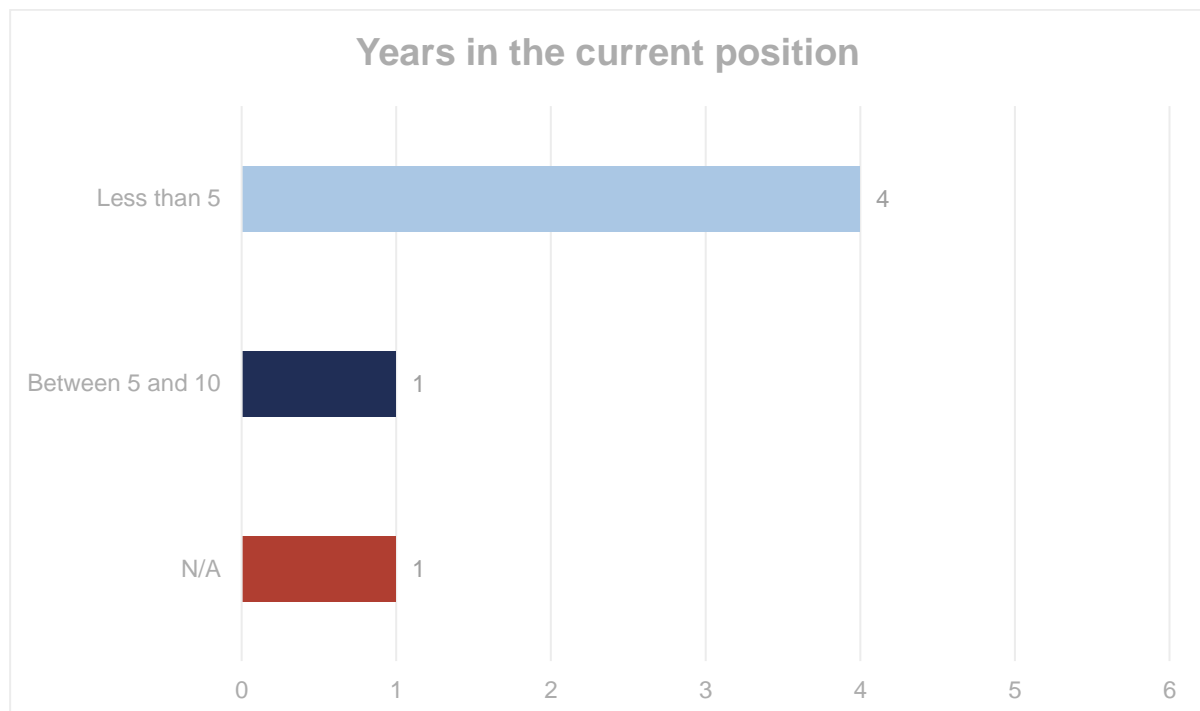
Years in the current position

Figure 38 - Graphic with the years in the current occupation of the SM#04 trainees

Figure 39 - Graphic with the academic level of the SM#04 trainees
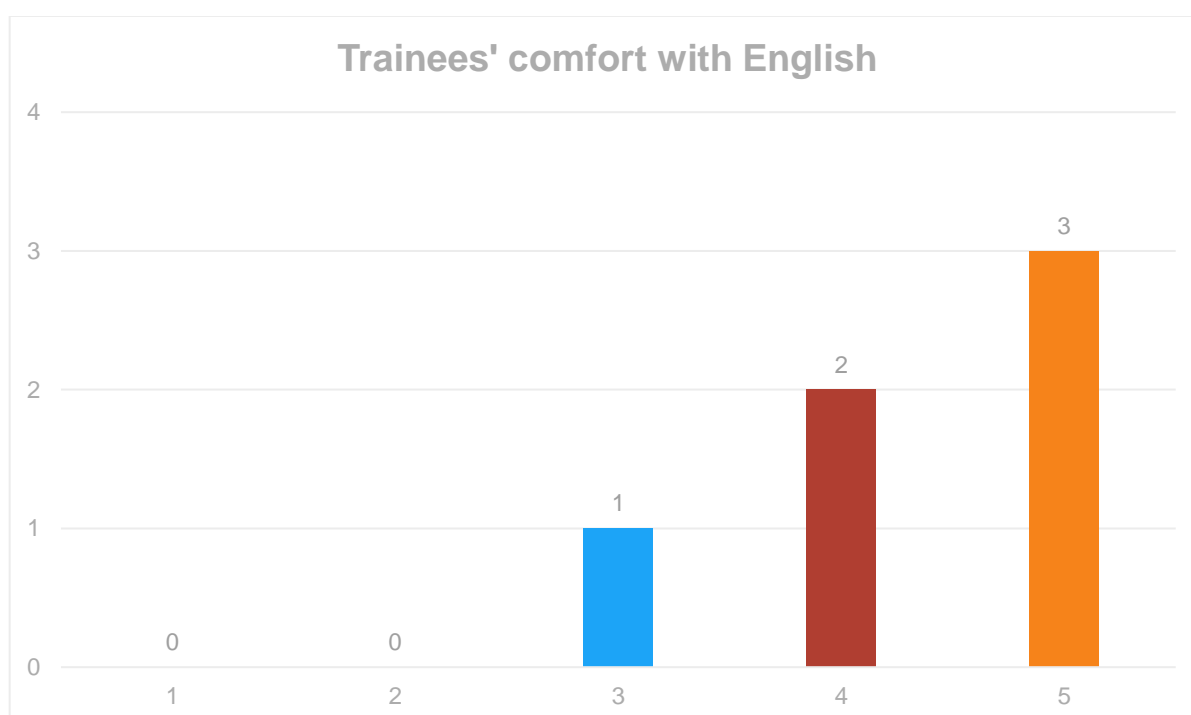
Figure 40 - Graphic with the level of comfort with English level of the SM#04 trainees

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8.15 Appendix O – Graphics of the "Artificial Intelligence and Machine Learning for aviation applications" (TM #02) trainees
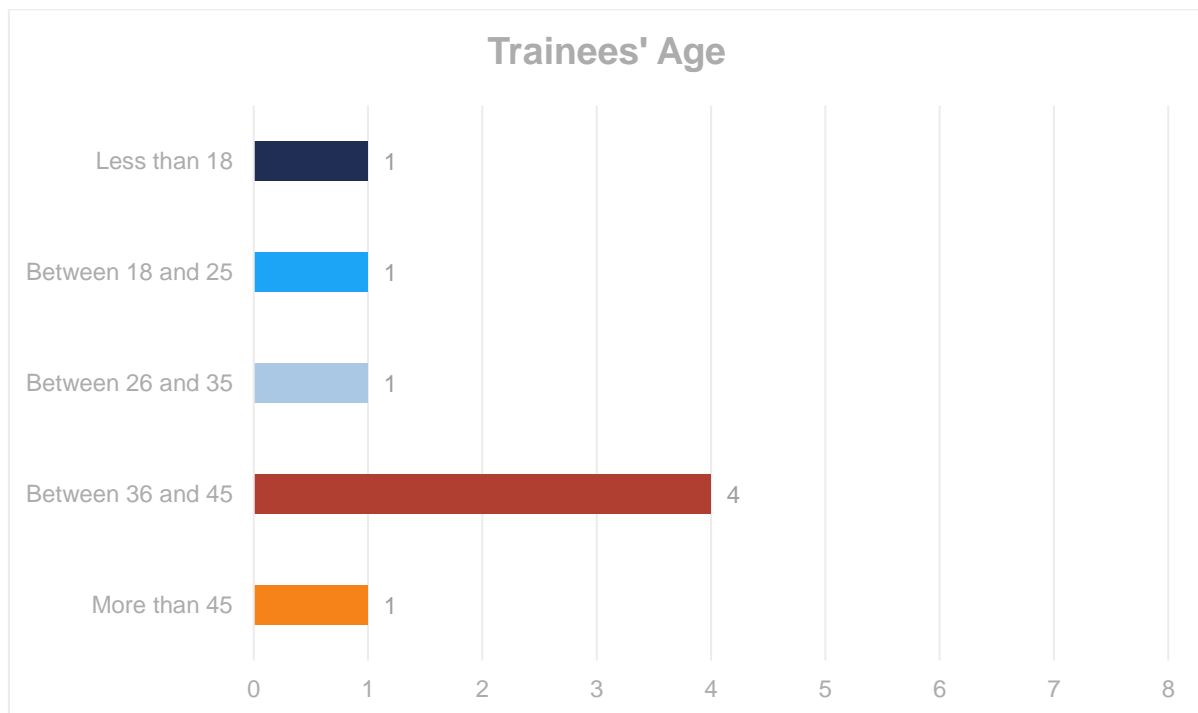
Figure 37 - Graphic with the age of the TM #02 trainees

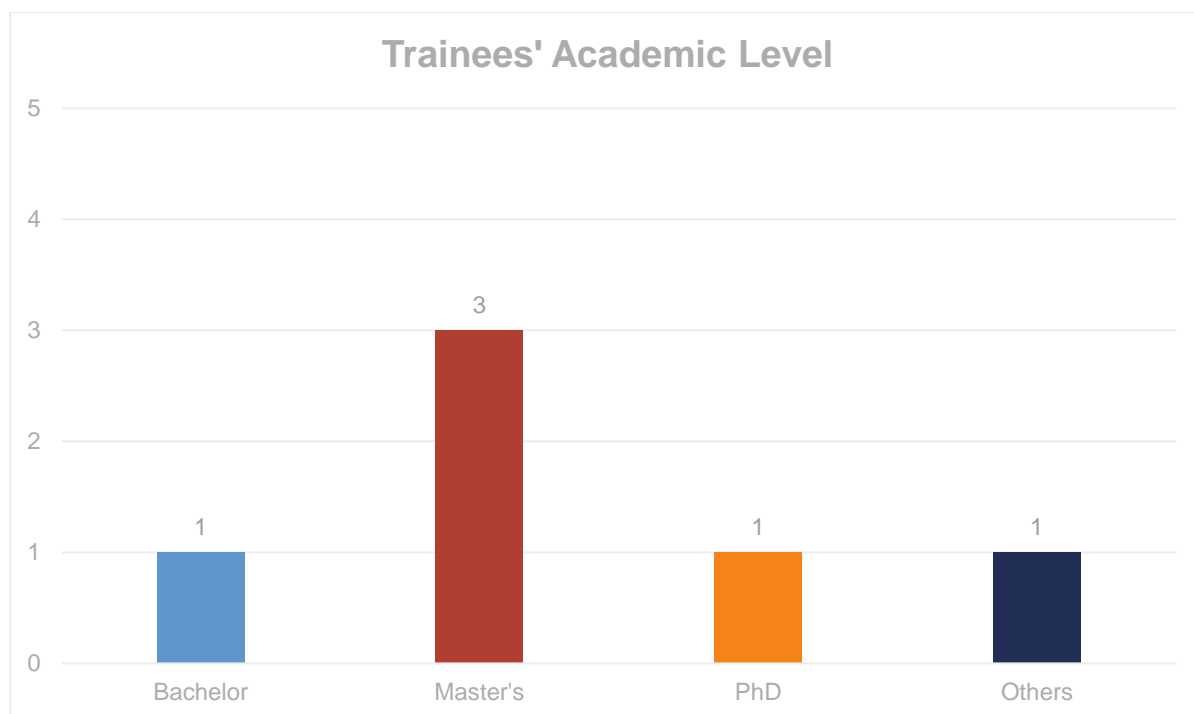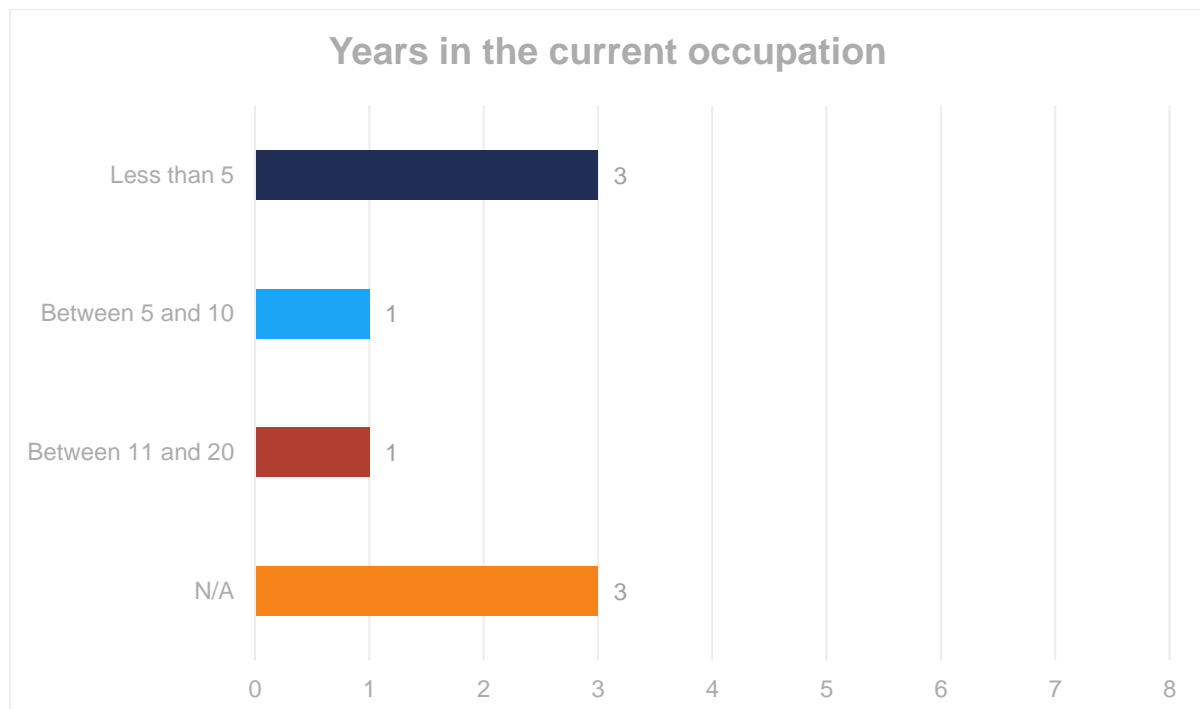**Figure 38 - Graphic with years in the current occupation of the TM#02 trainees**

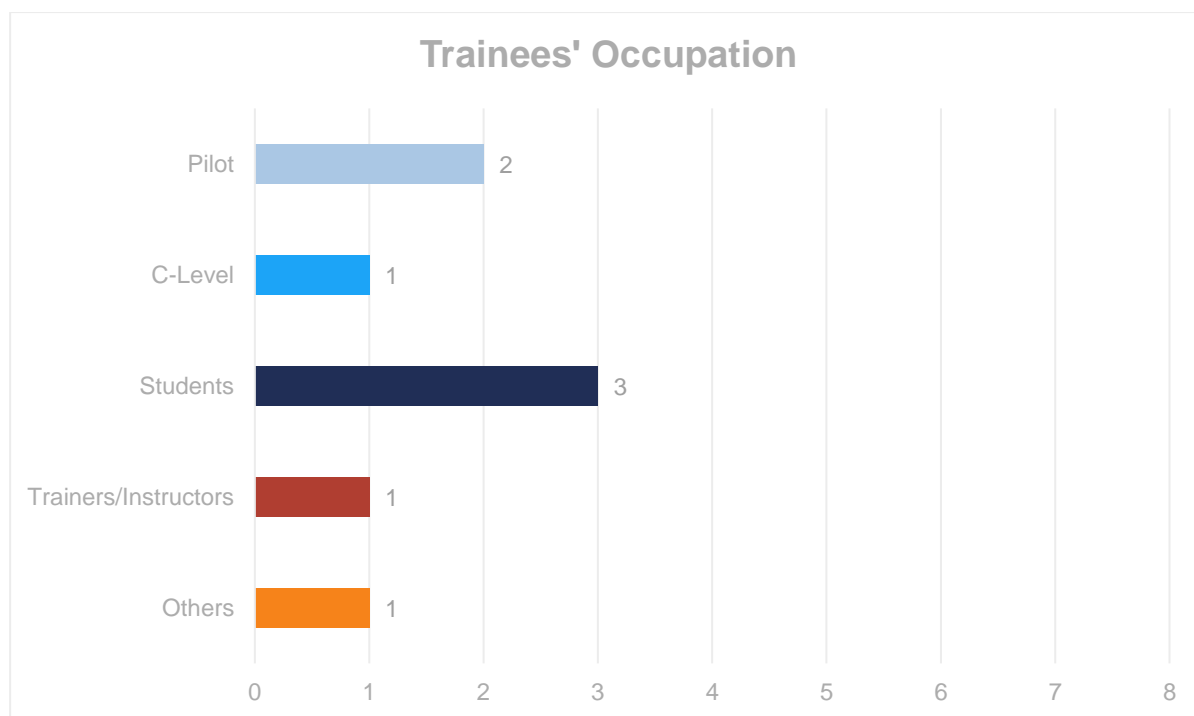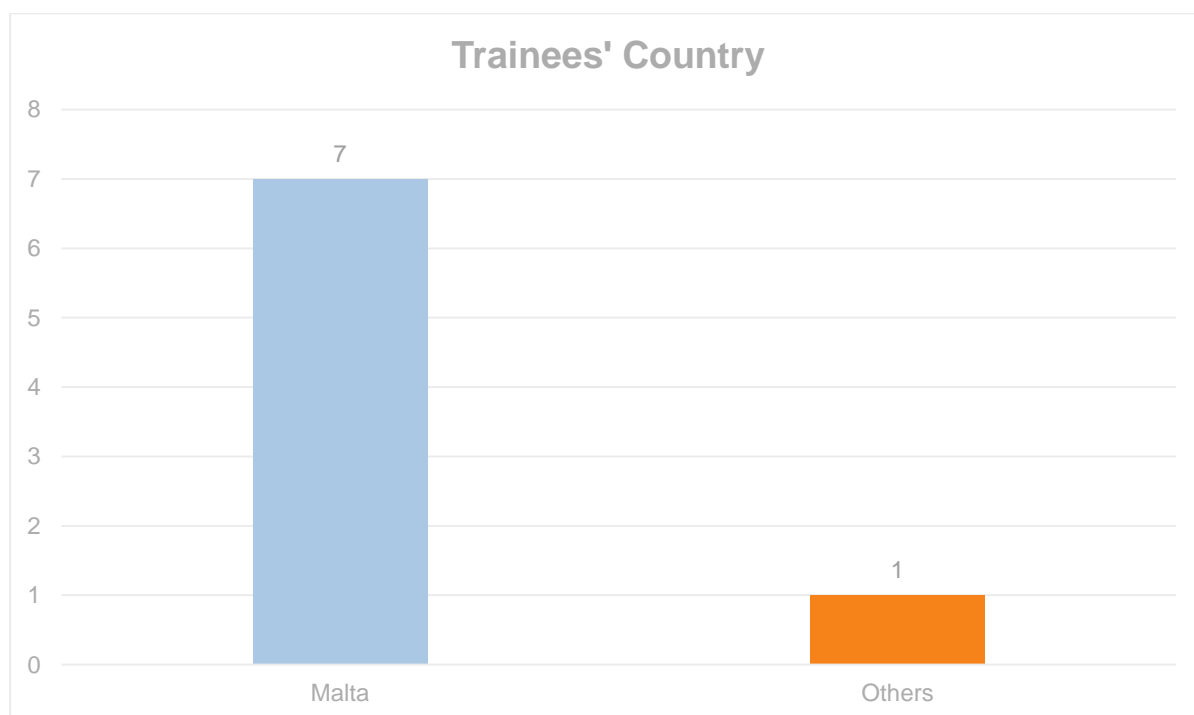**Figure 39 - Graphic with the current occupation of the TM#02 trainees**

Figure 40 - Graphic with country of the TM#02 trainees

SKILLING, UPSKILLING, RESKILLING IN THE FUTURE AIR TRANSPORT

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8.16 Appendix P – Logbook of "Houston, we have a problem: Problem-solving & Decision-making" (TM #01)

1. Trainers' Diary

Session 1

Was this activity successful? Why or why not?
Yes, as we learned about the personal experiences of the trainees and what they have to reconcile to be present at the training session. Regarding the case study presentation, it allowed the sharing of personal experiences that could relate to the situation and facilitate its resolution.

Were my students invested? If not, how can I encourage their commitment?
Although only two trainees showed up, they were invested in the training. An important aspect would be to reinforce the relevance of trainees viewing the videos on the platform.

Next class, what can I do differently to improve?
To try to direct the thinking more towards soft skills

Session 2

Was this activity successful? Why or why not?
The participant who attended the training session reviewed the videos posted on the platform, and therefore throughout the training session it was clear that he was comfortable with the topic and acquired the knowledge necessary to solve the case study.

Were my students invested? If not, how can I encourage their commitment?
The trainee proved to be very committed and participative, noting an evolution since the first session in terms of reasoning. He showed some insecurity in his answers.

Next class, what can I do differently to improve?
Always guide the trainee in such a way that he realizes that his thinking is unique, it is always going to be different from others, and that doesn't mean that it is incorrect.

2. Final Reflection

Now that you reached the end, please reflect on your training module delivery and implementation.

Still, only two participants attended the training sessions, which was positive because it allowed a more casual conversation among those present. Initially, only one Portuguese trainee was participating, which was more comfortable for us, as we had a more relaxed and less "cordial" attitude. It was interesting to understand his career path because it was very associated with reskilling. However, we had another participant from Malta, present in the two sessions. It was interesting to observe the trainee´s line of thought: very rational and pragmatic, focusing on the drone itself. The case study allowed the trainees to share personal experiences, in which inconveniences or surprises with drones were addressed. These synchronous moments were very rewarding, not only to hear about these experiences and meet new people but also to reflect on the added value of the skill-up project, which can help these participants to have a line of thought more related to soft skills.

8.17 Appendix Q – Logbook "Deepening of Situation Awareness" (TM #02)

1. Trainers' Diary

Session 1

Was this activity successful? Why or why not?
Firstly, this activity was successful as it was the first time the students could interact directly with the trainer and with each other. Secondly, the presentation of the example of self-assessment tool used in a former study has been greatly appreciated. Indeed, the students felt they could have a concrete tool to use after a practical training session.

Were my students invested? If not, how can I encourage their commitment?
The students were invested as it was a short session based mostly on the discussion about a tool they could imagine use in operational contexts.

Next class, what can I do differently to improve?
Maybe I could send the self-assessment tool before the synchronous session in order to let more time to the students to familiarize with the tool.

Session 2

Was this activity successful? Why or why not?
For the pilot session of this training module, the second synchronous session was essentially used to organise the focus group in order to collect the qualitative feedback of the trainees. Indeed, the participants were instructors and did not have the time to test the self-assessment grid of their situation awareness in operational contexts (as it was originally designed). However, they imagined what could have been the effects on future trainees.

2. Final Reflection

Now that you reached the end, please reflect on your training module delivery and implementation.
Concerning the whole training module, I think I could shorten the duration of each video lesson, select the most relevant content given the feedback provided by the

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students of the pilot sessions. I should add more examples during the lessons and end each video by a synthesis of the key points to remember.

8.18 Appendix R – Logbook "Strengthening Psychological Capital (TM #04)

1. Trainers' Diary

Session 1

Was this activity successful? Why or why not?
I believe the activity was quite successful. The reason I believe this was is also from my experiences from Covid 19 pandemic days. I have been working as a research assistant at Kastamonu University. For almost a year spending time at home and working remotely during the pandemic, I had to communicate with my students online. We had to conduct projects and give lectures on online platforms. That helped me to understand how beneficial online platforms can also be in education. However uploading videos only had always something missing. Being able to teach from the comfort of my home along with being able to see the reactions of students simultaneously made the best experience for me.

Were my students invested? If not, how can I encourage their commitment?
The students were very interested in both the class and the topic itself. I believe being able to point out the needs of the staff in the industry was the key point at getting students interest and commitment.

Next class, what can I do differently to improve?
Having students give their opinion on the topic would have made the class more exciting and beneficial for the students.

Session 2

Was this activity successful? Why or why not?

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I believe the activity was more successful than the previous class. It is because the trainer and the students got to know each other better from the first class. I observed that the students were less shy in the second class. They shared their opinion about the topic and seemed more eager to learn the topic.

Were my students invested? If not, how can I encourage their commitment?

The students were very interested in both the class and the topic itself. In this class, I used a case study to make the topic more relatable to their work life. I believe this technic got their attention more into the topic and will help them to use it at their work and daily life.

Next class, what can I do differently to improve?

In my experience from this pilot session, I believe that the more case studies and the attendance of students will improve the quality of learning.

2. Final Reflection

Now that you reached the end, please reflect on your training module delivery and implementation.

- Being able to see the reaction of the students during the class helped me to understand what was right and what was wrong to improve my classes
- Definitely, encouraging students to attend the class more and letting them speak more would have made the class more fun and exciting for the students.
- Practice makes everything better. Having more experience in the platform will help me to develop better classes overall.

Overall I believe the experience got better. Again, the practice makes it perfect. The cycle of this pilot sessions and the feedbacks from both trainer and students will help us to improve the quality of education we provide through Skill-UP

8.19 Appendix S – Logbook "Change Management for Automation and Emerging Technologies" (SM #01)

1. Trainers' LogBook

a. Trainers' Diary – Session 1 (Lesson 2)

Was this activity successful? Why or why not?

The training was successful. Because the participants participated in the synchronous lesson voluntarily. So they created time.

Were my students invested? If not, how can I encourage their commitment?
The students who attended the lesson were connected and eager. Because they also participated in other classes.

Next class, what can I do differently to improve?
More case studies should be done.

b. Final Reflection

Now that you reached the end, please reflect on your training module delivery and implementation.
The content of the course and the number of slides were ideal. The lesson was held without distractions from the students. If there were more slides and content they would be bored. It was a challenge to arrange the appropriate times for the participants.

a. Trainers' Diary – Session 2 (Lesson 3)

Was this activity successful? Why or why not?
The training was successful. Because the participants participated in the synchronous lesson voluntarily. I got positive feedback from students.

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Were my students invested? If not, how can I encourage their commitment?
The students who attended the lesson were connected and eager. Because they also participated in other classes.

Next class, what can I do differently to improve?
More case studies should be done.

b. Final Reflection

Now that you reached the end, please reflect on your training module delivery and implementation.
The content of the course and the number of slides were ideal. The lesson was held without distractions from the students. If there were more slides and content they would be bored. It was a challenge to arrange the appropriate times for the participants.

a. Trainers' Diary – Session 3 (Lesson 6)

Was this activity successful? Why or why not?
The training was successful. Because the participants participated in the synchronous lesson voluntarily. So they created time.

Were my students invested? If not, how can I encourage their commitment?
The students who attended the lesson were connected and eager. Because they also participated in other classes.

Next class, what can I do differently to improve?
More case studies should be done.

b. Final Reflection

Now that you reached the end, please reflect on your training module delivery and implementation.
The content of the course and the number of slides were ideal. The lesson was held without distractions from the students. If there were more slides and content they would be bored. It was a challenge to arrange the appropriate times for the participants.

a. Trainers' Diary – Session 4 (Lesson 9)

Was this activity successful? Why or why not?

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Were my students invested? If not, how can I encourage their commitment?
They gave correct answers to the evaluation questions about the acron courses. More than half of the participants were involved in the training.

Next class, what can I do differently to improve?
More case studies should be done. I can make the lesson more active with more visual and auditory materials.

b. Final Reflection

Now that you reached the end, please reflect on your training module delivery and implementation.
The content of the course and the number of slides were ideal. The lesson was held without distractions from the students. If there were more slides and content they would be bored. It was a challenge to arrange the appropriate times for the participants.

8.20 Appendix T – Logbook "How to Cope with Stress and Change to Fit in Future Roles: Change Adaptability and Stress Management" (SM #02)

1. Trainers' Diary

Session 1

Was this activity successful? Why or why not?
- Interactions with trainees - Active engagement with trainees - Active voluntary participation of trainees to the training - Time management - Engagement of the trainees with the contents and the trainers facilitated by a social dinner the day before the training
Were my students invested? If not, how can I encourage their commitment?
Students were actively taking part to every discussion
Next class, what can I do differently to improve?
- Mapping contents and make them more coherent with ATCOs' operational environment - Spread the training course on 2 days

2. Final Reflection

Now that you reached the end, please reflect on your training module delivery and implementation.
What went well? - Interactions and tools supporting lessons - Active engagement of the participants - Explanations - Time management - Social dinner the day before the training to engage the participants with the contents and with the trainers What could've been better? - Little connection between the training program and the Digital Tower environment - Exercises not so much structured - Scenario exercises partially functional since it was interpreted differently from what thought in the preparation step - Logistics - No Wi-Fi - Too many questionnaires What could you have done to overcome any challenge that you've felt? - Mapping digital tower's stressors - Introducing more the change management - Interviewing ATCOs already working in a digital tower - Checklist with to-do actions not to forget steps - Spread the training on 2 days - Add examples for each coping strategy - Deepen the coping section

8.21 Appendix U – Logbook "Learning and Practice of New Aircraft Procedures" (SM #03)

1. Trainers' Diary

Session 1

> **Was this activity successful? Why or why not?**

The synchronous session corresponded to the learning and practice with the virtual reality tool. Each student had to learn and practice autonomously the aircraft procedure. The trainer and the virtual-reality expert were present in order to answer to specific questions or in case of technical issues with the training device.

This activity was globally successful. The students enjoyed learning the procedure this way. They said it was amusing and they enjoyed being immersed in a virtual A320 cockpit.

> **Were my students invested? If not, how can I encourage their commitment?**

The students were invested. They also felt challenged by the feedback given at the end of each run of the procedure (time spent and number of errors).

> **Next class, what can I do differently to improve?**

One drawback of the virtual reality device is its high sensitivity to the interaction with the student's hands. As a consequence, sometimes the device counts an action as an error whereas the student did the correct action. The virtual reality tool could probably be modified in that way in order to have fewer "false" errors.

2. Final Reflection

> **Now that you reached the end, please reflect on your training module delivery and implementation.**

Globally the training module reached its objectives. Some additional instructions in the use of the virtual reality tool should be provided, as many students committed the same errors (e.g., indicating more clearly that the student has to touch the title of the procedure in order to start the recording of their interactions with the device and get feedback at the end).

8.22 Appendix V – Logbook "Managing myself: towards a safer life: Workload Management & Stress Management" (SM #04)

1. Trainers' Diary

Session 1

> **Was this activity successful? Why or why not?**

Regarding the case study presentation, this allowed the sharing of personal experiences that could relate to the situation and facilitate its resolution. The fact that the participants were the same as in the previous session, allowed them to be more comfortable to share their doubts and other questions. The participants mentioned that the case study was not as real as the previous one, which is an interesting observation and point for improvement.

Were my students invested? If not, how can I encourage their commitment?

More analytical and engineering-focused thinking, but more open to psychological issues and what the module specifically required.

Next class, what can I do differently to improve?

Try to direct the thinking more towards soft skills. Before the session check that the platform is working properly.

Session 2

Was this activity successful? Why or why not?

Yes, there was clarification of doubts, developed critical thinking and reflection, although with some difficulties.

Were my students invested? If not, how can I encourage their commitment?

More analytical and engineering-focused thinking, but more open to psychological issues and what the module specifically required. Tenta pensar por etapas/passo a passo.

Next class, what can I do differently to improve?

Always guide the trainee in such a way that he realizes that his thinking is unique, it is always going to be different from others, and that doesn't mean that it is incorrect. Apesar de os módulos terem alguns pontos em comum, tentar ajudar o formando a separar as águas, os conteúdos que estão incluídos num módulo e noutro.

2. Final Reflection

Now that you reached the end, please reflect on your training module delivery and implementation.

The training sessions only had one participant, which on the one hand was advantageous because it allowed for more relaxed dialogue among those in attendance. Being more relaxed and less "cordial," we felt more at ease that this individual was Portuguese. Understanding his job path was intriguing because it was strongly correlated with reskilling. It was intriguing to watch the trainee's stream of thought, which was quite pragmatic and logical and focused on the drone specifically.

The case study gave the student the chance to talk about their own personal experiences with drone annoyances or surprises. These synchronous moments were highly fulfilling, both for hearing about these encounters and meeting new individuals as well as for considering the value-added of the skill-up project.

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