THE OPINIONS OF TRAINEE PILOTS AND INSTRUCTOR PILOTS TOWARD eLearning: A Needs Analysis for In-Service Training Programs

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ABSTRACT

eLearning has many important components that can enhance students' situational awareness and, as a result of this, it has come to prominence as an approach that can replace traditional methods in theoretical pilot training. Thanks to this method it is possible for learners to complete the longest stage of pilot training independent of time and place. Through eLearning that meets present day requirements, and that is supplemented by well-designed educational materials, it is possible to provide theoretical pilot training to the masses in a globally standardized way. The main purpose of this study is to undertake a needs analysis for providing theoretical pilot training through eLearning and to determine possible opinions about the use of eLearning in these training programs. In accordance with this goal, an open-ended survey and individual interviews have been conducted with trainee pilots and instructor pilots to understand the target group's perspective on providing theoretical pilot training through eLearning.

The study also makes an assessment of this new system from the perspective of the target group, and provides some recommendations for developing an eLearning program.

Keywords: eLearning, aviation, pilot training, need analysis, opinions, trainee and instructor pilots.

INTRODUCTION

In the twenty-first century, air travel is the preferred method of long-distance transportation across the world. With ever-increasing numbers of passengers, the number of required airplanes and personnel has been increasing as well.

The most significant source of increase in personnel numbers comes from pilots. Pilot training is a long and labor-intensive process. On average, a pilot training program takes 18 months, 6 months of which is dedicated to theoretical training and the remaining 12 months of which are used for flight practice training.

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Aviation is by nature a dynamic environment, both from the perspective of flight hours and team planning. During the pilot training process, the planning of practice flights, which are performed as part of practice applications, is also performed dynamically. The advantage of this dynamic approach is that working students can be provided with flexible practice flight times.

In this way, students can arrange their flights according to a certain program. Conversely, the same does not hold true for theoretical training. Theoretical training is held in a face-to-face environment in classrooms, with the presence of a teacher and other students. Theoretical training groups take place at a pre-determined time, and include people from different fields and different professions; as a result of this, some candidate pilots find them unable to carry on with their own profession and are eventually forced to resign from their jobs. Because of this, fewer people may apply to these training programs, resulting in a failure to meet the required minimum number of applications. The continuation of this vicious cycle may serve as a hindrance for those people who want to be pilots. By designing a training program that can be provided to students without being dependent on time and place, it is possible to take a step towards a solution for these problems. In this way, working students can be freed from the obligation of being present in a classroom at a certain time, and the provision of training can be increased.

ELearning allows learners to carry on with their education without being bound by time and place. Another advantage of this approach is that compared to classroom education its costs are much lower (Acarbay, 2016). Removing boundaries and decreasing costs are two factors that can facilitate the participation of more people in theoretical pilot training. In this study, the authors investigate possible opinions concerning the provision of theoretical pilot training via eLearning. The authors also analyze applications in the system, and attempt to recommend solutions for issues that people are doubtful about.

The Purpose of the Study
The main purpose of this study is to outline a needs analysis for eLearning that can be applied to trainee and instructor pilots in a theoretical pilot training setting. In line with this goal, and in accordance with feedback received from respondents, the authors aim to facilitate greater awareness regarding learning activities in theoretical pilot training that can be provided via different environments, such as eLearning.

On the other hand, this study is also to focus on trainee and instructor pilots' opinions about the provision of theoretical pilot training via eLearning, and to determine any reservations they may have about the matter.

The Background of the Study
Since the early 2000s, eLearning has begun to be used in academic education in the field of aviation. As Herron, Holsombach-Ebner, Shomate and Szathmary (2012) mention in their study, Embry-Riddle Aeronautical University provides eLearning in sub-fields of aviation. In the same study the researchers also point out that Embry-Riddle Aeronautical University benefits from web, mobile and cloud technologies in eLearning in the field of aviation.

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They explain that, thanks to eLearning, there are many people who are married, and who have children, in the student profile of the university, as well as people from different occupation groups, including both civilians and the military. ELearning in aviation has in this way reached many more people than previously had access to aviation training.

Kearns (2013) studied the educational design strategies of mobile learning in the field of aviation. Kearns's study explains that aviation training can be provided in small time slots distributed across multiple sessions. Thus, thanks to mobile learning, the probability of students being affected by external commitments will be diminished and the quality of education can be increased.

Chuang, Chang, Wang, Chung and Chen (2008) looked at the training provided to TransAsia pilots in many different chapters and analyzed the effect of providing this training electronically. 2,660 trainees attended 143 courses that were provided via e-learning. According to the data obtained by the study, pilots were satisfied with the education provided in the electronic environment.

In addition, the company was able to increase its monetary gains as a result of electronic learning and contribute to the enhancement of aviation safety through the continuous education it provided. In another study, Raisinghani, Chowdhury, Colquitt, Reyes, Bonakdar, Ray and Robles (2005) mention that pilots who were in the target group had confidence in the eLearning method, which was carried out with educational materials that were equipped with audio-visual and interactive elements.

On the other hand, there can be a severe lack of effective communication between the flight crews (Demiray and Misnevs, 2016). The power distance in the cockpit needs to be understood and recognized by not only the flight crew but also management. Where multi-cultural crews are concerned, efforts need to be made to reduce the power gradient through eLearning.

With regards to studies conducted in the field in question, it is observed that schools which provide aviation education benefited from eLearning to different degrees in the mid-2010s. When one looks at the websites of schools that provide pilot training, for example, it is seen that 50% to 90% of theoretical courses are provided via eLearning. Courses that require usage of tools and operational equipment are provided face-to-face. Likewise, it is observed that in Turkish flight schools, too, there are perceptions that practical courses cannot be provided via eLearning. This study, therefore, has significance as it records the opinions of trainees and instructors with regards to how eLearning can be utilized in aviation.

METHOD

Research Model
The main goal of this study is to undertake a needs analysis for providing theoretical education through eLearning at flight schools that provide theoretical Airline Transport Pilot's License (ATPL) education.

In addition, since the authors aim to determine the thoughts and reservations of trainee and instructor pilots about the provision of theoretical courses through eLearning, the study has been designed as a qualitative case study.

Qualitative case research is built around the researcher's role and involves the processes of data collection, data analysis and data interpretation as well as involves seeking answers to a question from the viewpoints of different triangulations (Patton, 2001).

In this process, researchers establish their own concepts in this study. Within the scope of the above discussions, the reasons why this study has been designed as a qualitative case study are as follows:

- ✓ Throughout the study, eLearning in theoretical pilot training was rigorously explored.
- ✓ The opinions of trainee and instructor pilots concerning the use of the eLearning method in theoretical pilot training were explored.
- ✓ The two items above were tackled by asking "How?" and "Why?"
- ✓ Trainee and instructor pilots' opinions about the use of eLearning in theoretical pilot training have not previously been made explicit.

Research Field and Participants

This research encompasses trainee pilots receiving pilot training at different institutions as well as instructor pilots working at these institutions. The trainees have been selected on a volunteer basis from two different flight schools and from among those who had completed their theoretical training. Ten trainees from the first flight school and eight from the second flight school, a total of 18 trainees, participated in the study. The reasons why trainees who had already completed their theoretical training were included are as follows:

- ✓ They are knowledgeable about theoretical ATPL training.
- ✓ They can analyze the positive and negative aspects of the theoretical training environment.
- ✓ They are in a position to be able to provide recommendations for improving the theoretical ATPL training process.
- ✓ They have an idea about the strengths and weaknesses of face-to-face training that can be received via eLearning.

The eight instructor pilots who took part in the study have been teaching at one of Turkey's long-established pilot training institutions, where pilot training has been carried out for the past 29 years.

All of the instructor pilots have 10 or more years' experience, having over 5,000-flight-hours experience.

The participating instructor pilots also took part in the study on a volunteer basis. Figure 1 shows the age distribution of participating trainee and instructor pilots. 72% of participating trainee pilots is in the age group 25-30, whereas all of the instructor pilots are 40 and over.
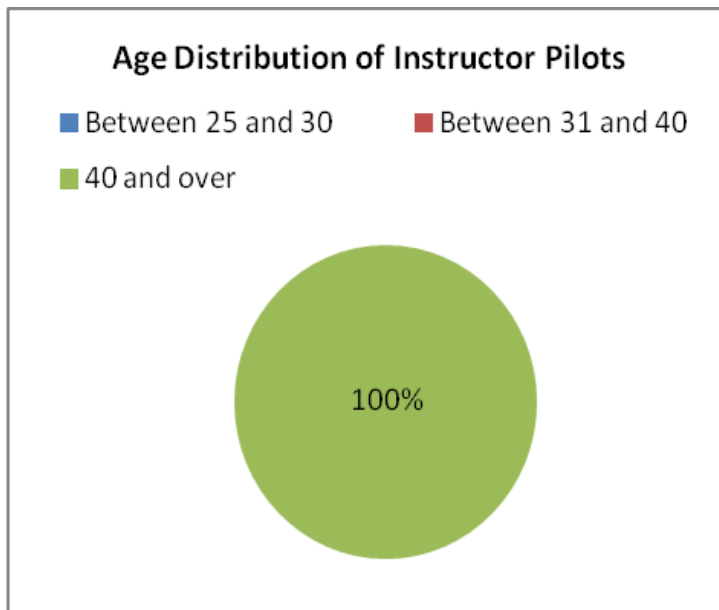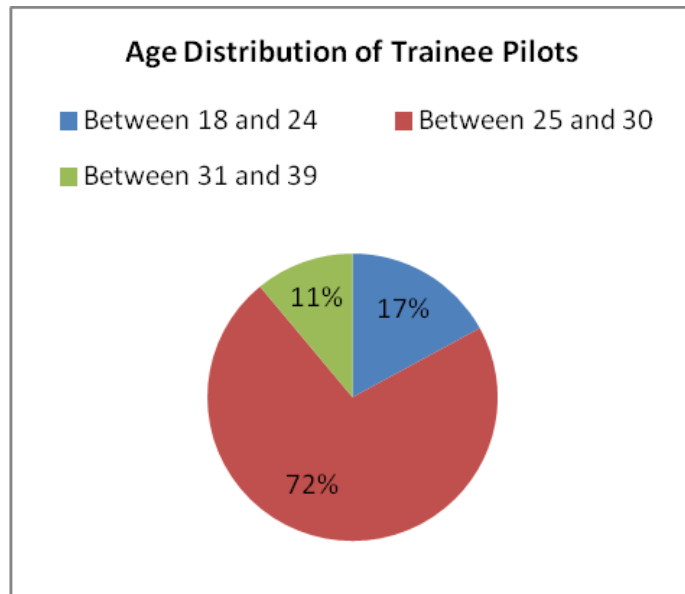
Age Distribution of Trainee Pilots

- Between 18 and 24
- Between 25 and 30
- Between 31 and 39

11% 17%
72%

Age Distribution of Instructor Pilots

- Between 25 and 30
- Between 31 and 40
- 40 and over

100%

Figure 1.
Age Distribution of the Target Group

Figure 2 presents the educational status of participating trainee and instructor pilots.

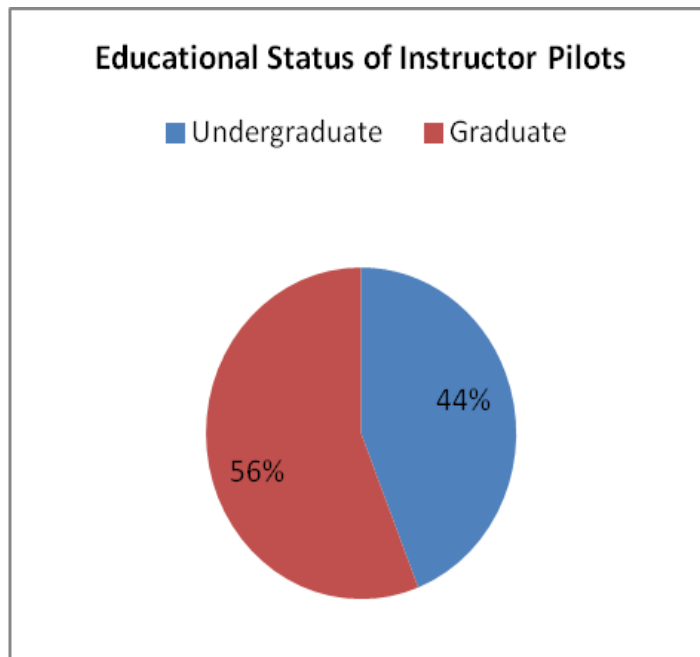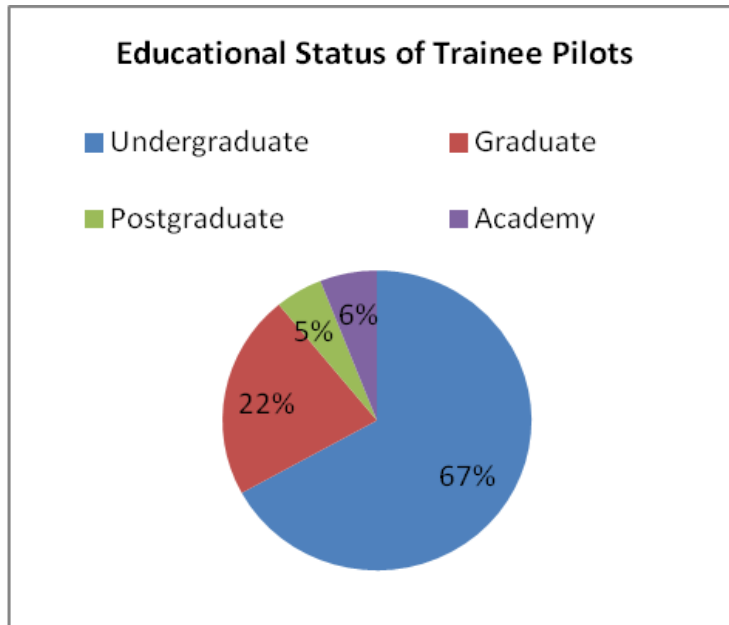**,67% of trainee pilots have undergraduate degrees, while 56% of instructor pilots have a master's degree.**

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Educational Status of Trainee Pilots

- Undergraduate
- Graduate
- Postgraduate
- Academy

6%
5%
22%
67%

Educational Status of Instructor Pilots

- Undergraduate
- Graduate

44%
56%

Figure 2.
Educational Attainment of the Target Group

Figure 3 presents the flight hours of participating trainee and instructor pilots. While 46% of trainee pilots have 50-100 hours' flight experience, all of the instructor pilots have more than 5,000 hours' flight experience.
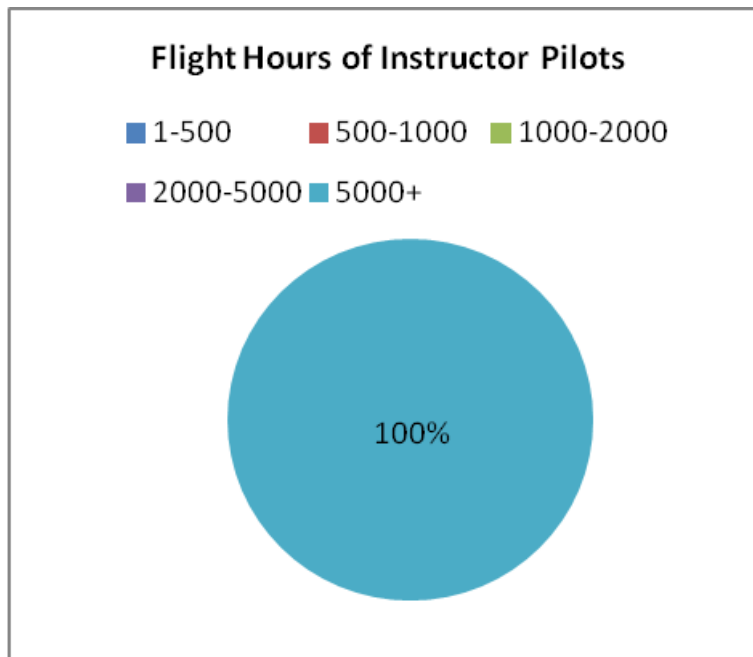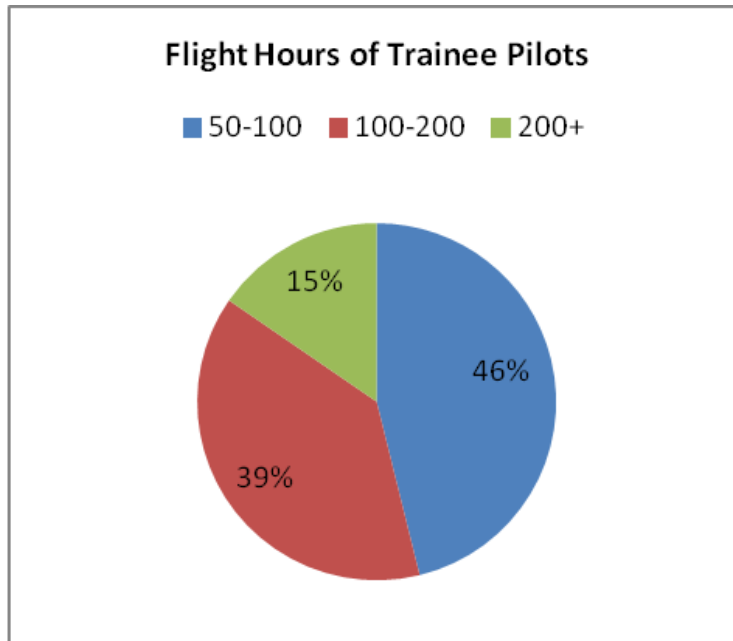
Figure 3.
Flight Hours of the Target Group

Figure 4 shows the distribution of the schools from which participating trainee and instructor pilots most recently graduated. 44% of trainee pilots and 67% of instructor pilots graduated from university engineering departments.
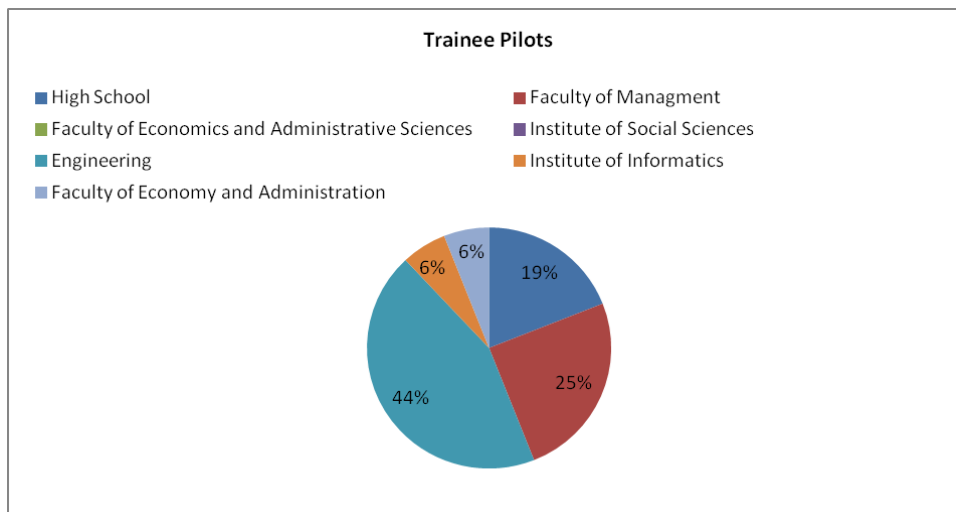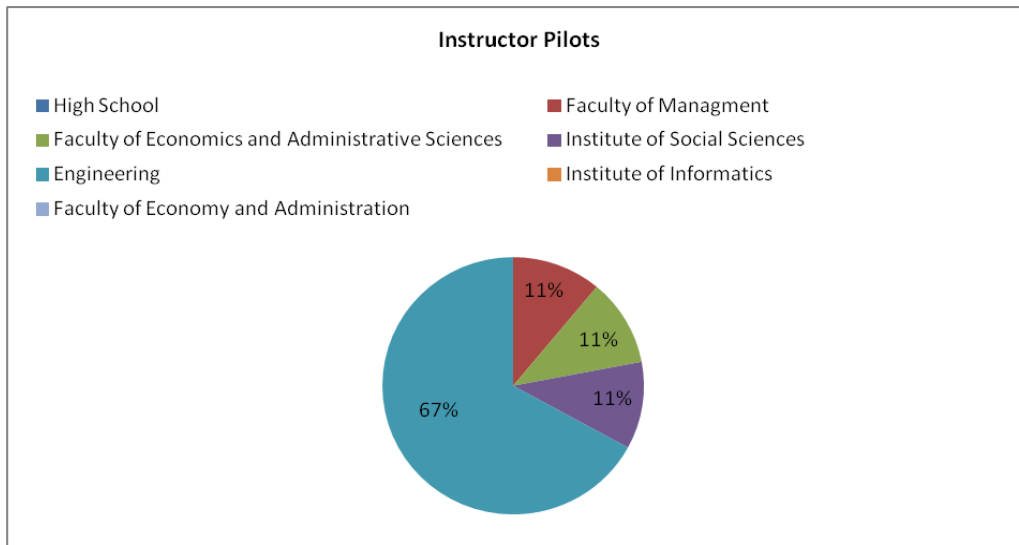
Instructor Pilots

- ■ High School
- ■ Faculty of Managment
- ■ Faculty of Economics and Administrative Sciences
- ■ Institute of Social Sciences
- ■ Engineering
- ■ Institute of Informatics
- ■ Faculty of Economy and Administration

11%
11%
11%
67%

Trainee Pilots

- ■ High School
- ■ Faculty of Managment
- ■ Faculty of Economics and Administrative Sciences
- ■ Institute of Social Sciences
- ■ Engineering
- ■ Institute of Informatics
- ■ Faculty of Economy and Administration

6% 6%
19%
25%
44%

Figure 4.
Schools from Which Members of the Target Group
Most Recently Graduated

Data Collection Instrument and Data Analysis

The study employed two different qualitative data collection instruments. The first of these instruments is the semi-structured and open-ended survey questions that were presented to the study's target group.

Open-ended survey questions were prepared using Google Forms and cloud technology. In the dissemination of the survey to the target group we utilized Google Drive cloud technology. While preparing the survey questions, we analyzed the previously-outlined studies in the literature.

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As a result of this literature review, the analyses we conducted and a scope analysis, we prepared open-ended questions for the survey.

Trainee and instructor pilots were asked what they think about the provision of eLearning versus face-to-face training in theoretical pilot training.

In addition, survey participants were also asked how the training should be structured if it involved eLearning or face-to-face training.

In the second stage of the study, individual one-on-one interviews were conducted with the trainee pilots (4 people) and instructor pilots (3 people) who had positive or negative opinions about the subject matter of the study.

Survey and interview participants took part in these activities on a volunteer basis.

Throughout the study, the identities of participants were kept confidential and data was not shared with anybody other than the researcher.

The responses given in the survey and the individual interviews were analyzed by the researchers and their main themes were identified.

Credibility of the Study

One of the research criteria used in analyzing the use of the eLearning method in theoretical pilot training is that the data obtained in the study, and the analysis and results of this data, should be credible and reliable.

According to Creswell (2013), in order to achieve credibility in qualitative research, long term interaction, in-depth data collection, triangulation, expert analysis and participant approvals are required.

In order to attain credibility in this study, therefore, the following procedure was undertaken:

- ✓ The survey and interview questions that were prepared in line with the needs analysis will be clearly stated, and the study will include appropriate stages of data collection, analysis, interpretation and conclusion.
- ✓ The scope of the methods and processes that the researchers followed throughout the study will be defined in a clear and detailed way.
- ✓ The validity of the study will be ensured with survey and interview questions having been prepared within the scope of research on the usability of eLearning in theoretical pilot training. Likewise, method triangulation, source triangulation, analytical triangulation and theoretical triangulation will help enhance the credibility of the study.
- ✓ In preparation of the survey and interview questions and during the pilot interview, an academic who is an expert in the field of qualitative research will accompany the researchers, and the interviews will be monitored and controlled.

- ✓ **In order to prevent data loss in individual interviews, a voice recording device will be used. Without including any statements that may disclose the identity of the person being interviewed, all the data will be transferred to a computer and analyzed in detail.**
- ✓ **To ensure information security, security-related preventive measures will be taken for the interview records that are transferred to a digital environment.**

Strengths and Weaknesses of the Study

This study, which aims to outline a needs analysis for use of the eLearning method in theoretical pilot training, has been designed as a qualitative case study.

Guided by the literature review, survey questions were prepared and interviews were conducted with the people who were chosen by a purposeful sampling method.

In this way we aimed to systematically benefit from different data collection methods, in order to validate the data and increase the triangulation.

Each stage of the study was checked by experts in the field of qualitative research and continuous feedback was received.

One of the two researchers who carried out this study is a graduate of an aviation department, while the other is an expert in qualitative research.

Having researchers from different disciplines allowed the study to look at the same phenomenon from different angles, and simplified the process of making the required analysis.

In addition, since the data collected was transferable, this study can be used to shed light on subsequent studies.

These points constitute the strengths of the study. The data collected by this study reflects the opinions of trainee pilots who receive education at certain flight schools and instructor pilots who teach at these institutions.

It was observed that participants in the study mostly used the "responding at first sight" technique. In addition, the data collected does not allow for generalizations. These points constitute the weaknesses of the study.

FINDINGS AND DISCUSSIONS

The main goal of this study is to gather the opinions of trainee pilots and instructor pilots about providing theoretical ATPL training through eLearning. To this end, trainees and instructors were asked to respond to four open-ended questions.

Their responses to the questions were as follows Table 1.:

Table 1.
Trainee Pilots' Opinions about the 1ˢᵗ Question

Age	Education	Opinions
18-24	Undergraduate	1. The most effective educational environment is the classroom environment. 2. Problems can be overcome in a classroom environment.
25-30	Undergraduate, Master, PhD	1. With the condition of preserving the quality of education, eLearning can be applied. 2. Points that are unclear or things that are not understood will remain as question marks, and that eLearning will give way to an education system based on rote learning. 3. Students' educational background is the determining factor. ELearning can be applied for students with an engineering background. 4. With the condition that practice-oriented courses are provided in a classroom environment, other courses can be taught via eLearning. 5. ELearning can be an applicable system if it is supplemented with educational materials. 6. ELearning is a useful system for students and instructors if there are questions and answers at the end of chapters. 7. ELearning can be useful from the perspective of time and efficiency. 8. ELearning can save time and money, however, understanding the subject matter will be more difficult than in a classroom environment.
31-39	Undergraduate, Master	1. ELearning cannot be applied in all courses. On the other hand, application /practical courses should be provided in a classroom environment. 2. The theoretical pilot training system itself has some problems, so that eLearning can be a good educational system for saving time.

The first question of the survey is about what trainee pilots think about providing theoretical ATPL training via eLearning. The opinions of trainee pilot who responded to this question are summarized in Table 1.

When the students who responded to the survey were analyzed, we observed the following:

- ✓ Students in the 18-24 age group think that theoretical pilot training should be given in a classroom environment.
- ✓ Survey participants in the 25-30 age group have more positive opinions about eLearning than other age groups. Another opinion held by this age group is that practical training cannot be performed via eLearning. In addition, this group thinks that for eLearning in theoretical pilot training, supplementary materials should be developed.

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✓ **Students in the 31-39 age group have some reservations about providing theoretical pilot training via eLearning. They mentioned that applications and practices would be better if they were held in classroom environment and that eLearning environments should be equipped with supplementary materials.**

In the light of the data obtained from the trainee surveys, it is observed that the trainees underline the existence of a lack of information about providing theoretical pilot training via eLearning.

Many of the survey participants mentioned that they did not have enough information about the provision of theoretical pilot training through eLearning.

Half of the students who did not have enough information mentioned that they may possibly want to try eLearning, while the other half mentioned that they would not want to try it.

Table 2.
Instructor Pilots' Opinions about the 1st Question

Age Group	Educational Attainment	Opinions
40+	Undergraduate, Master's	1. Thinks that not all courses can be taught via eLearning. 2. Thinks that theoretical training can be provided via eLearning. Thinks that the language used in this training will have a determining effect. 3. Thinks that eLearning cannot be applied to all courses. Thinks that there is no adequate educational material for eLearning in the current system. 4. Thinks that eLearning can be applied in theoretical pilot training. Mentions that training should provide answers to all possible questions. 5. Thinks that eLearning is an applicable system. Mentions, however, that it is hard to apply it for all the courses.

Table 2. presents the answers of instructor pilots who responded to the first question. When the responses of participant instructor pilots are analyzed, we observe the following:

✓ **In general, instructor pilots think that eLearning is an applicable system in theoretical pilot training.**
✓ **Instructor pilots think that there are no adequate educational materials for eLearning.**
✓ **Instructor pilots describe the requirements of eLearning as follows:**
✓ **ELearning must be supported with appropriate supplementary materials**

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- ✓ **Possible hard-to-understand points must be anticipated ahead of time and the education must be structured accordingly**
- ✓ **Points that students do not understand must be reinforced with question-and-answer sections.**

As a result of the interviews conducted with instructor pilots, it is suggested that the eLearning system can be tried in theoretical pilot training.

One of the instructor pilots interviewed pointed out that this system could be useful in decreasing costs, but that it would not be useful from the perspective of educational efficiency.

The opinions of trainee pilots who responded to the question,

> *"If ATPL theoretical training in pilot training is provided through eLearning, how would you like this training to be structured?"*,

are presented in Table 3.

When the trainee pilots' responses were analyzed, we observe the followings:

- ✓ **Students in the 18-24 age group want the eLearning to be conducted in English by instructor pilots who have airline experience. They also think that training should be reinforced with end-of-chapter questions and exams.**
- ✓ **Likewise, students in the 25-30 age group think that questions in the question bank should touch upon appropriate subjects in the theoretical training. Students in this age group support the idea that the educational environment should be updated with respect to student needs.**
- ✓ **Students in the 31-39 age group think that there should be a question-and-answer section at the end of each chapter, and that training should be flexibly structured.**

In the light of the information obtained from the three different age groups, we determined that student expectations were similar.

The common expectations of the students who participated in the study can be summarized as follows:

The questions in the ATPL question bank should be included in the subjects during the training, training should be updated with respect to classroom and environmental conditions, and training should be supported with supplementary materials.

During the interviews, with regard to the second question, the trainee pilots mentioned that subjects should be treated in phases, and that courses should allow for retrospective tracing of each subject. 26

In addition, trainees commonly agree on the idea that course materials should be supplemented with videos, animations and materials that help motivate the students.

Table 3.
Trainee Pilots' Opinions about the 2nd Question

Age Group	Educational Attainment	Opinions
18-24	Undergraduate	1. Thinks that the instructor should be a pilot who has experience of airline companies and that teaching should be in English. 2. Thinks that after the online course videos, questions about the subject matter should be pulled from a question pool, and that periodical exams should be held during the training.
25-30	Undergraduate, Master's, PhD	1. Thinks that lecturing should be supported by a platform whereby students can ask questions. Finds it appropriate that there should be questions and answers analyzing each question type in the pool. 2. Considers the system inadequate. Thinks that lecturing subjects from a distance with respect to questions will be the most appropriate for students. 3. Thinks that, without elaborating too much on theoretical issues, the classroom environment and face-to-face training should be provided together and that this should be determined by experts in the field. Argues that training should be supported by homework and online exams. 4. Believes that the educational environment should be renewable with respect to students. 5. Thinks that subjects should be accessible whenever the student wants. Suggests that a person who knows the system should lecture in a question-oriented way. 6. Suggests that eLearning should not bother fast-learners and wear away slow-learners. 7. Suggests that training should be designed to steer the student to thinking. Also mentions that theoretical training should be supplemented with appropriate materials. 8. Suggests that course materials should be open to student access. Also mentions that there should be a question-and-answer chapter.
31-39	Undergraduate, Master's	1. Points out that there should be a question-and-answer section at the end of the chapter. 2. Thinks that there should be an educational system that allows for flexibility.

The opinions of the instructor pilots who responded to the second question are presented in Table 4. When we analyze instructor pilots' opinions we observe the following:

- ✓ **Instructor pilots think that training in which eLearning and face-to-face education techniques are used together is better.**
- ✓ **They argue that training should be supported by supplementary materials and that there should be question-and-answer sections at the end of each chapter.**
- ✓ **They think that courses should be taught by people who are experts in their fields and who can certify their qualifications.**

When we analyze the opinions of trainee and instructor pilots we see that these two points come to the fore with regards to what the features of the use of eLearning in theoretical pilot training should be: questions in the question bank should be discussed at the end of chapters, and instructors should be pilots and have experience in the field.

Table 4.
Instructor Pilots' Opinions about the 2nd Question

Age Group	Educational Attainment	Opinions
40+	Undergraduate, Master's	1. Thinks that training can be in the mother tongue or in English, if the instructors can certify their level of proficiency. Thinks that there should be quizzes at the end of chapters. 2. Thinks that a system should be designed in which certain courses are taught through eLearning and other courses are taught in a classroom environment. 3. Thinks that courses should be taught as a block, successively following one another, in a hierarchical manner. 4. Thinks that 20%-30% of the training should be face-to-face, while the rest of it should be designed and taught in an interactive way or using CDs. 5. Thinks that training must be designed and constructed by a commission in which both instructor pilots and experts in the field of eLearning take part. 6. Thinks that teaching of the theoretical part of the lecture should be followed by practices and applications. 7. Thinks that courses should be taught in an interactive way and recorded so they can be watched again later.

The instructor pilots who responded to the second question mentioned that course content should be in line with internationally recognized legislation and content, and that the same course content should be adopted by all flight schools. Instructor pilots also underlined the suggestion that the lecturer should be someone who is experienced in the field, who is knowledgeable about the course content and who can lecture interactively through eLearning.

The opinions of trainee pilots who responded to the question, "*What do you think about the provision of face-to-face teaching in theoretical ATPL training?*", are presented in Table 5. When the answers are analyzed, we observe the followings:

Table 5.
Trainee Pilots' Opinions about the 3rd Question

Age Group	Educational Attainment	Opinions
18-24	Undergraduate	1. Thinks that since theoretical pilot training is quite a difficult program, education in a classroom environment is more advantageous. 2. Thinks that since it is possible to intervene Instantaneously when a student has even a small problem in a classroom environment, this training method makes the learning process easier and shorter.
25-30	Undergraduate, Master's, PhD	1. Thinks that since there is abundance of subjects to cover in theoretical ATPL training, these subjects should be treated in an exam-oriented fashion. 2. Thinks that in face-to-face training, airplane related courses should not be taught with sketches on the board or presentations, but with animations and practical applications. 3. Thinks that students' attention should be drawn to the course and they should be compelled to think about the subject matter. 4. Thinks that courses should be taught by instructors who have comprehensive knowledge of the subject, who can explain adequately and who know the system well. 5. Thinks that it is easier to understand the main theme of the subject by education in a classroom environment. 6. Thinks that students should always be kept within the education process and that their active participation in the class should be facilitated. 7. Suggests that the training program should encourage students' thinking. In addition, thinks that theoretical training should be supplemented with appropriate materials. 8. Thinks that application and practical courses should be held in a classroom environment.
31-39	Undergraduate, Master's	1. Thinks that students should be able to find the answers to all their questions.

✓ **Students in the 18-24 age group think that the training of difficult and hard-to-understand subjects can be taught more effectively in a classroom environment.**

✓ **Students in the 25-30 age group want to receive lectures from people who are experts in their fields and in a classroom environment with exam-oriented content.**

✓ **One respondent in the 31-39 age group, however, thinks that he should get answers to his questions in the training that is provided in a classroom environment.**

Students who participated in the interviews expressed the opinion that in regards to this question, application-oriented courses should be taught face-to-face. Another opinion that was suggested by the students was that students' motivation can be maintained more effectively in a classroom-based educational environment. The opinions of instructor pilots who responded to the third question are presented in Table 6.

Table 6.
Instructor Pilots' Opinions about the 3rd Question

Age Group	Educational Attainment	Opinions
40+	Undergraduate, Master's	1. Thinks that training can be in students' mother tongue or in English, if the instructor can certify their language proficiency. 2. Thinks that the instructor should pass their experience to the students during the lectures. 3. Thinks that rather than face-to-face training, eLearning is more useful with the condition that students should be able to ask instructors about elements that they did not understand in the course.

In the interviews held with instructors, all but one of the instructor pilots mentioned that, rather than teaching all courses in a classroom environment, it would be better to apply a combined education structure to the theoretical pilot training system. Only one instructor expressed the opinion that educational efficiency would be higher if education was provided within a classroom environment.

The opinions of trainee pilots who responded to the question, "*How would you like the theoretical ATPL training in pilot training to be structured, if is provided face-to-face?*", are presented in Table 7. When the responses of students are analyzed, we observe the following:

- ✓ Trainees think that application and practice should be given more coverage in the training.
- ✓ Instead of lecturing a single course consecutively throughout 5-6 hours, they think that lectures should be divided and taught in certain time slots.
- ✓ They think that a combined approach in training would be more appropriate.

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Table 7.
Trainee Pilots' Opinions about the 4th Question

Age Group	Educational Attainment	Opinions
18-24	Undergraduate	1. Any available materials should be used to facilitate students' understanding of the subject in the simplest way. An experienced instructor should lecture and state-of-the-art technology should be used. 2. Because students take theoretical ATPL courses face-to-face in a school environment, does not think structuring is needed.
25-30	Undergraduate, Master's, PhD	1. Thinks that, rather than teaching courses in one day covering many chapters, dividing them and providing teaching at different times is far better for students' learning. 2. Thinks that subjects that are no longer in existence should not be covered in the courses. In addition, mentions that courses with similar content should be taken in the same term to simplify the learning process. 3. Thinks that courses should be taught as packages. 4. Thinks that the classroom environment and eLearning should be used together. Underlines the point that the instructor should be experienced and should be able to pass his knowledge to students. 5. Thinks that practice and application should be given more space in training. 6. Thinks that theoretical training materials should be supplemented with more visual materials and that there should be application and practices in the courses. 7. Supports the idea that classrooms should have fewer students. 8. Thinks that theoretical pilot training needs to be modernized with respect to the requirements of the present day. 9. Suggests that students should be provided with content that will enhance their motivation during training.
31-39	Undergraduate, Master's	1. Thinks that in order for the courses to be fully comprehended there should be time intervals between lectures, and that course content should be designed in a way that would allow anyone to understand it.

In response to this question trainee pilots expressed the opinion that interactive environments should be utilized more extensively. The trainees mentioned that teaching with presentations and using the board made it harder to understand some subjects; therefore new educational methods in the classroom environment would be beneficial.

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The opinions of instructor pilots who responded to the 4th question are presented in Table 8. when respondent instructor pilots' opinions are analyzed, we observe the following:

- ✓ **Similar to the opinions of trainee pilots, instructor pilots think that a combined educational system would be more advantageous.**
- ✓ **They suggest that applications and sample questions should be given more space in training, and that a more interactive training environment should be implemented.**
- ✓ **They think that the instructor should be a pilot who can convey his or her experience to the trainee pilots.**

When the answers of trainee and instructor pilots to the 4th question are analyzed, we see that both groups support the combined training method. In addition, trainee and instructor pilots agree that there should be a more interactive environment in the training.

Table 8.
Instructor Pilots' Opinions about the 4th Question

Age Group	Educational Attainment	Opinions
40+	Undergraduate, Master	1. Emphasizes that textbooks should be colored and genuine. Also approves the suggestion that training should supplemented with visual and audio materials. Thinks that the answers to ATPL questions should be provided to instructors during the course term. 2. Thinks that the instructor should be a pilot and should demonstrate experience and knowledge of practical applications, and should convey this knowledge to trainees. 3. Thinks that courses should first be treated in a theoretical framework and then in a problem-solving setting. 4. Instead of a singular approach in education, finds the adoption of an approach combined with eLearning more appropriate.

Interviews held with instructors show that instructors agree that the pace of lecturing, details of the subject and supplementary course materials should be determined with respect to the levels of students.

CONCLUSION AND RECOMMENDATIONS

In order to investigate the applicability of eLearning in theoretical pilot training, this study used a survey that had open-ended questions, and conducted one-on-one interviews.

As a result of the analysis and interpretation of all the information we obtained, we have reached the following conclusions:

- ✓ **In designing eLearning methods in theoretical pilot training, the prime objective should be not to lower the quality of education.**
- ✓ **The success of the new system to be used in theoretical pilot training is dependent on the qualifications of those who implement it. The common desire of both trainees and instructors is that training should be provided by instructor pilots who have experience in the interface.**
- ✓ **The design used in eLearning for theoretical pilot training must take students into account above all else, and should allow for interactive approaches.**
- ✓ **The following points should be taken into account in the content to be designed for theoretical pilot training:**
- ✓ **Questions in the question pool should be answered at the end of relevant subjects.**
- ✓ **Course content should be compatible with fast search.**
- ✓ **Courses should allow for watching lectures multiple times.**
- ✓ **Exams should be knowledge and practice-oriented.**

Figure 5 shows positive and negative opinions regarding the use of eLearning in theoretical pilot training.

Figure 5.
Results Pertaining to Trainee and Instructor Pilots' Opinions
about the Use of eLearning in Theoretical Pilot Training

Throughout the study, it has been observed that trainee pilots keep themselves at arm's length with regards to the use of eLearning in theoretical pilot training. Possible recommendations for eliminating this distanced attitude and introducing students to eLearning are as follows:

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- ✓ **For trainees who receive theoretical pilot training in a classroom environment, educational environments should be designed in which they can have access to the eLearning method. Encouraging steps should be taken to incentivize students to use these environments in their training. In this way, students' introduction to eLearning can be facilitated and it will be possible to collect more robust data in the future.**
- ✓ **In theoretical pilot training there is no worldwide system, such as Massive Open Online Courses (MOOC), which can be easily accessed by anyone. Therefore a primary and/or supportive platform should be established for pilot training students. This platform should be able to meet the requirements of trainee and instructor pilots. For example, it should be designed in the English language. A design such as this will facilitate the introduction of trainee and instructor pilots to eLearning.**
- ✓ **In theoretical ATPL training, there are courses that require an understanding of practical applications. There are some doubts as to whether these courses can be taught via eLearning. Therefore, particularly for practice and application oriented courses, eLearning materials should be prepared and put to the use of students. Necessary arrangements and updates should be made in line with any feedback obtained.**
- ✓ **By means of a commission of experts, the advantages of eLearning should be applied to theoretical pilot training. On the other hands, the development of new educational materials for pilot training should be facilitated by means of sub-commissions.**

In conjunction with other studies that will be conducted in the light of the information obtained from this study, it will be possible to take steps towards active use of eLearning in theoretical pilot training.

In this way, it will be possible to introduce standardization to the eLearning method, which is presently used by flight schools in their theoretical pilot training. Likewise, thanks to these standards, it will be possible to reach maximum educational efficiency.

Since eLearning is not very frequently applied in theoretical pilot training, taking steps to eliminate the points that people are doubtful about is of significant importance for trainee and instructor pilots. For an effective application of eLearning, national and international aviation authorities at different levels should form various commissions.

These commissions should be able to guide education towards more innovative approaches. Furthermore, they should work towards determining an educational interface that is supplemented with appropriate learning materials, in line with today's requirements.

This is important from the perspective of structuring the theoretical pilot training via the eLearning method. In this way, it will be possible to implement an approach which is, to a great extent, standardized, which saves time and money, and which allows more people to become pilots.

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In line with the rapid growth of the aviation sector, the need for qualified and well-educated personnel has been increasing at a steady pace. Including the training for the airplane they will use, the average training period for pilots who are brought into the sector is close to two years. Provision for this long training process, which requires the utmost care, and which must be carried out in the best possible way, is very important from the perspective of flight safety.

In order to increase students' situational awareness, therefore, it is important that the theoretical courses in which information about aviation and pilot training is provided benefit from new teaching methods and educational supporting materials.

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