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A Study on the Factors Affecting the Flight Training Progress for Student Pilots Training Abroad

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Abstract: *In this paper, we first analyse the flight training progress abroad, and then analyze the reasons that affect the flight training progress. The factors that affect flight training can be attributed to personal factors, meteorological factors, etc. Among them, personal factors are the main factors affecting flight training, including the English proficiency of student pilots, the study of professional theoretical knowledge, flight attitude and psychology, and flight skills. Meteorological factors are mainly weather factors. In addition, factors affecting flight training include the shortage of aircraft and some problems of flight instructors. Finally, in this paper, we study how to speed up the flight training progress of student pilots, and puts forward some valuable suggestions.*

Keywords: *Student Pilots; Flight Training; Training Progress; IASIO Flight Training School*

1. Introduction

The training of civil aviation pilots can be divided into two stages: theoretical study and flight training. Due to various reasons such as airspace, China's domestic flight training capabilities for student pilots are very limited, which cannot meet the training needs of airlines for pilots. Due to the early start of the aviation industry in the United States and other western developed countries, there are a large number of Part 141 flight training schools, and the cost of flight training is relatively low. Many domestic aviation colleges and airlines send student pilots abroad for training. To a large extent, solving the problems of insufficient domestic flight training capabilities. For flight training abroad, the training progress of pilot trainees not only directly affects the trainees themselves, but also indirectly affects the airlines and aviation colleges that send them to the training, and even affects the airline's aircraft purchase, pilot follow-up training and company development. Therefore, it is very important to complete the process of flight training abroad with high efficiency and high quality.

2. Introduction to the Flight Training Process Abroad

There are a large number of Part 141 flight training schools overseas recognized by the Civil Aviation Administration of China [1]. As of November 2021, there are 35 overseas flight training schools with valid certificates, most of which are located in the United States. The Part 141 flight training schools in the United States all implement the integrated flight teaching mode, that is, the combination of theoretical teaching and practical learning, the combination of instructors and students, and the combination of simulated flight and real flight. The flight training process generally starts with theoretical teaching, followed by practical drills, first on the ground, then in the air, first instructional flight, and then solo flight [2]. Theoretical teaching mainly adopts the methods of classroom lectures, self-study, discussions and assignments. Ground training is mainly to use flight simulators and other training equipment to simulate and practice the technical movements of aerial flight [3]. At the same time, it is necessary to frequently practice visual inspection, mental arithmetic, recite data, method essentials, and dictate the flight process. When flying in the air, by completing various flight training such as instructional flight, solo flight, inspection flight and check flight, students can master superb flight skills.

The entire flight training stage is mainly divided into three stages [4], the private pilot license training, the instrument rating training and the commercial pilot license training. In the private license training stage, the students need to do 50 hours of ground theoretical training, 50 hours of instructional flight and 10 hours of solo flight training, that is, students must have at least 60 hours of flight training time before the official examination. In the instrument rating training stage, the students need to do 50 hours of ground theoretical training, 80 hours of real aircraft instructional flight training and 30 hours

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of simulator flight training, that is, students must have at least 110 hours of flight training time before they conduct an official examination. Both the private license and instrument rating stages are completed on a single-engine aircraft, while the commercial license training stage. In the commercial license training stage, the trainees are conducted on twin-engine aircraft, which requires at least 30 hours of real aircraft instructional flight training and 10 hours of simulator flight training, then the students can take the check flight.

3. Analysis of Factors Affecting the Flight Training Progress

3.1 Personal Factors

The personal factors of student pilots have a great influence on the flight training progress, including the students' English proficiency, the mastery of aviation theoretical knowledge, the attitude of flight training, flight technology and psychological quality.

3.1.1 English Proficiency

English is an essential language tool for cadet pilots in foreign training [5]. Before flight training at a flight training school abroad, student pilots must pass the National College English band 4 Test, the IELTS and the English interview organized by the flight training school in China. Although some students have passed all the above tests, they still have language barriers in flight training. The radiotelephone communication is a necessary procedure for flight, which is directly related to the process of flight training and flight safety. By investigating the IELTS scores of 50 students who have completed flight training in the IASCO flight training school, the relationship between the IELTS score and the time students completed flight training was calculated, as shown in Table 1.

Table 1: Relationship between IELTS score and time spent on completing flight training

IELTS score	Number of people	Time
5	15	Two years
5.5	25	One and a half years
6	10	One year

From Table 1, we can see that among the students with an IELTS score of 5, 15 students spent 2 years to complete the flight training; for the students with an IELTS score of 6, 10 students spent one year to complete the flight training; It can be seen that students with high IELTS scores spend relatively less time to complete the training.

3.1.2 Basic Theory of Aviation

During flight training, the theoretical knowledge of aviation is very important, it is the basis of flight, and student pilots must fully master and understand the theoretical knowledge of aviation in order to fly better.

During the training period of the IASCO flight training school, the ground theory courses offered by the flight training school include "aviation regulations", "aviation weather", "aircraft performance", "aeromedicine", "aircraft system", "radiotelephone communication", etc. , After completing a ground theory course, there will be a corresponding ground theory test. The score of passing the test is 80 points, and students who fail the test will have to take a make-up test, and the score of the same make-up test is also 80 points. If you fail to pass the make-up exam again, then the flight training school will discuss with the airline to which the student belongs to discuss whether to temporarily ground the student, resulting in a delay in the student's flight training progress. It can be seen that it is very important for students to master and understand aviation professional knowledge, which not only directly affects the flight training progress, but also may be related to flight safety issues.

3.1.3 Flight Training Attitude

In flight training, pilots may have five hazard attitudes. Which are: Anti-authority: “Don’t tell me.”, Impulsivity: “Do it quickly.”, Invulnerability: “It won’t happen to me.”, Macho: “I can do it.” and Resignation: “What’s the use?” Hazardous attitudes can contribute to poor pilot judgment, and then can affect the flight safety.

3.1.4 Flight Technology

Flight technology is the comprehensive technology of the pilot to fly the aircraft. When the student pilots had just undergone the flight training, they only have a vague concept of flying, so there's no

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flying skills [6]. With the continuous flight training, some students may experience uncoordinated and unstable operation of the aircraft, resulting in failure to pass each flight course smoothly and need to be re-trained.

At the same time, some student pilots have relatively strong comprehension ability, and under the guidance of flight instructors, they can complete every movement accurately, stably and harmoniously, thus speeding up the flight training progress. In this case students, with good flight skills can easily pass the flight test, while those students with poor flight skills have to take two or even three flight tests to pass, therefore, there is a gap in the trainees' flight training progress

3.1.5 Psychological Quality

The psychological quality of pilots is particularly important. A pilot with good psychological quality is often able to cope with various tests. When encountering danger, he can handle and solve problems very calmly. If a pilot with poor psychological quality, he will do not know what to do when encountering an emergency during the flight, he will become very nervous and even threaten flight safety. Especially in the check flight, student pilots with better psychological quality perform well in the assessment and can successfully complete the flight tasks, while pilots with poor psychological quality may forget the flight procedures due to nervousness, resulting in failure to pass the exam, thereby slowing down the training progress.

3.1.6 Overall Analysis

We conducted a survey on 100 student pilots, and returned 95 students' questionnaires, then we analyze the relationship between different factors and affect flight training progress, as shown in Table 2.

Table 2: The Relationship between Different Factors and Affect Flight Training Progress

Different factors	Degree of influence	Number of people
English proficiency	Non/Medium/larger	2/27/66
Aviation theory level	Non/Medium/larger	5/53/37
Flight training attitude	Non/Medium/larger	4/59/32
Flight technology	Non/Medium/larger	2/41/52
Psychological quality	Non/Medium/larger	8/38/49

It can be seen from Table 2 that 66 students believe that English proficiency has a great influence on the flight training progress, accounting for 69%; 52 students believe that flight skills have a great impact on the flight training progress, accounting for 55%; There are 59 students who think that the attitude of flight training has a moderate impact on flight progress, accounting for 62%; 53 students believe that aviation expertise has a moderate impact on flight training progress, accounting for 56%.

We can see that the students' English proficiency and flying skills have a great impact on the flight training progress.

3.2 Meteorological Factors

Meteorological factors are important external factors that affect flight training, including weather, low visibility, and low clouds.

3.2.1 Weather Factors

IASCO Flight Training School is located in Redding, California. It has a typical Mediterranean climate, with hot and dry summers, mild and rainy winters, and controlled by westerly winds in winters. Frontal cyclones are frequently active and the climate is mild. The temperature in the coldest month is between 4-10 degrees Celsius. During the period, there is abundant rainfall.

The annual precipitation of the airport is 300-1000 mm, about 60%-70% in the winter half year, only 30%-40% in the summer half year, and the rainfall in winter is more than that in summer. Therefore, in the process of flying in summer, due to the high temperature, it has a great impact on the performance of the aircraft. When the outside temperature reaches about 40 degrees Celsius, many flight plans will be cancelled, and the training schedule will be reduced.

3.2.2 Low Visibility

In the flight training process of private license and commercial license, the external environment is generally the condition of visual reference flight, that is, under VFR conditions, the requirement is that

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the visibility is greater than 5 miles, and the cloud base is higher than 3000 feet. Reading Airport is dry and rainy in summer, and fires often occur, resulting in the impact of low visibility for 1 to 2 months. The VFR conditions are not met, and almost all flight plans will be cancelled during this period.

Other conditions that cause low visibility include fog and sand. Because Reading is surrounded by mountains, there is often radiation fog, and there are monsoons every winter, which can also lead to low visibility.

When performing instrument flight, although it is possible to conduct flight training under the condition of IFR (when the outside visibility is less than 3 miles and the cloud base height is less than 1000 feet), the low visibility will also lead to poor air quality, and flight plans will be cancelled due to poor air quality.

3.2.3 Low Clouds

Due to the Mediterranean climate in Reading, the winters are mild and rainy. For flight training in winter, low clouds are generally encountered and ice accretion may also occur. Ice accretion is a very dangerous condition for flight, it will not only affect the performance of the aircraft, but may also cause the malfunction of the instruments.

Generally, there is no de-icing device in the aircraft models that the pilots conduct flight training, so these aircraft cannot fly into the icy area.

During instrument flight training, although it is possible to fly through clouds, the problem of aircraft icing should also be taken into account when the outside temperature is very low, and flying in the clouds will cause turbulence, which may cause damage to the structure of the aircraft. Therefore, no matter whether the students are conducting private and commercial license training, or instrument training, low clouds will affect the flight training progress.

3.3 Problems with Flight Training Schools

3.3.1 Shortage of Aircraft

Aircraft is a tool for pilot training, and it is also an important guarantee for students to conduct flight training. If there is a shortage of aircraft, students' flight training progress will be slowed down.

3.3.2 Inexperienced Flight Instructors

A flight instructor is a guide who teaches flight skills to student pilots. There is a general shortage of instructors in overseas flight training schools, and many flight instructors are newly recruited. Due to the limited experience of new instructors, problems encountered during flight training cannot be handled well, and teaching methods also need to be improved in the process of work. The training progress of previous batch of students is generally relatively slow.

4. Suggestions for Improving Training Progress

4.1 Improve English Proficiency

English is the basis for flight students to train abroad, and it is also a necessary communication tool for flight. Improving English proficiency is of great significance to speed up the training progress.

Student pilots should pay more attention to "listening" and "speaking" in English when they study English in college.

Do at least two hours of listening training every morning and evening. In the process of listening training, you must first listen to a listening article blindly. If you do not understand it, then read the article and listen to it again and again. Listen to an article until you can understand every sentence of the article, and then go to the next article;

For improving students' English speaking ability, first of all, students should express themselves in English bravely and boldly, and not be afraid of making mistakes. Students can watch American TV dramas or movies, and then imitate the pronunciation and tone of foreigners. Put yourself into a specific environment, perform role-playing, or simulate the environment at that time in your mind to ensure the combination of language and environment.

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4.2 Consolidate Professional Basic Theory

Professional basic theory guides flight practice. Only with solid professional basic theory can it play a role in ensuring flight safety, thereby improving the flight progress of students training abroad. Some students only pay attention to the study of English while ignoring the study of aviation theory during their training abroad, which is very wrong. In each training stage, there will be a corresponding theoretical examination. Students should continuously consolidate and review the theoretical knowledge they have learned, so that they can fully master all the theoretical knowledge and pass the theoretical examination smoothly.

4.3 Correct Flight Attitude

During training at the flight training school, student pilots should focus on flying, correct their flying attitude, and be proactive. When encountering problems in flight, students should take the initiative to ask their instructors, and they cannot pretend to understand. Students should be responsible for their own flight, and don’t think that they will be able to pass the train when they go abroad. Therefore, students must correct their attitudes, study flying skills assiduously, be not impulsive, have no fluke mentality, abide by laws and regulations, and not blind. Only in this way can you have a good attitude towards flying and speed up your flight progress.

4.4 Chair Fly

Chair fly is sitting on a chair or other objects to conduct simulated flight. This kind of flight is to let pilots familiarize themselves with flight procedures continuously, so as to reduce the mistakes of flight operation. Chair fly simulations are available to students under any circumstances. When you close your eyes, imagine that there are various instruments on the opposite side, and then use your hands and feet to simulate a real flight.

Flight simulation can not only speed up the improvement of the flight technical level of the flight crew under various weather conditions, but also effectively improve the flight crew's ability to deal with special situations, which has played a positive role in shortening the training period, improving the training quality, and ensuring flight safety. Only through flight simulation can we learn fast and well in the process of flight training.

5. Conclusion

The factors that affect the flight training progress can be divided into two categories: personal factors and external factors. The personal factors of student pilots have a greater impact on the flight training progress, including the students' English proficiency, the study of aviation theoretical knowledge, the attitude of flight training, flight skills and psychological quality. External factors include meteorological factors, flight training school factors and so on.

Through the analysis, it can be seen that English proficiency is the primary factor affecting the training progress. From the relationship between the IELTS score and the time spent by the students to complete the flight training, it can be seen that the students with high IELTS scores spend relatively less time to complete the training. The survey analysis also shows that the English proficiency and flight skills of the students have a great influence on the flight training progress.

External factors also have an impact on the training progress, but for student pilots, it is more important to solve their own problems, including improving their English proficiency, consolidating professional basic theories, correcting their flying attitude, and conducting chair fly.

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