

Exploration on the Teaching Reform of Aviation Power Equipment Course Based on Industry Standards

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Abstract

Aviation power plant course is the core course of flight technology specialty, and its teaching effect plays an important role in achieving the goal of pilots training. By analyzing the problems existing in the course teaching, adopting the on-site teaching mode of simulator, integrating the industry standard into the course teaching content, establishing a process assessment system based on the industry standard, effectively improving the students' ability to operate the engine and deal with emergencies, and ensuring the realization of the course teaching objectives.

Keywords

Teaching Reform, Aviation Power Equipment Course, Industry Standards.

1. Introduction

In recent years, civil aviation higher education has made considerable progress, the number of colleges and universities, the number of students in school is increasing, and the quality of education and teaching has been greatly improved. With the implementation of China "Big Aircraft" project, the construction of university curriculum guided by civil aviation industry standards is also in full swing [1]. However, compared with the general disciplines such as electronics, electromechanics and computer, which are relatively mature at all levels, there are still many shortcomings in the course construction and development of civil aviation higher education, so how to absorb the existing disciplines is still in progress. Improving the quality of education and teaching and the experience of curriculum construction, learn from others's strong points to offset one's weakness, and implementing civil aviation curriculum construction in Colleges and universities in strict accordance with industry standards, especially combining with the effective construction of professional courses in industry enterprises, are the problems that researchers and university teachers should ponder over and try to solve in practice. Aviation power plant, also known as aeroengine, is a device that provides power for aircraft and promotes its progress. At present, Aero-Power devices mainly include aero-piston engine (including propeller) and aero-gas turbine engine. Aero-power devices play a key role in the power, economy and operational reliability of aircraft, so they are called the heart of aircraft.

2. Course Attributes

Aviation power plant is a basic course for undergraduates majoring in aircraft technology. For students majoring in flight technology, according to the training objectives of pilots and through the teaching of this course, they should be able to understand the basic structure and working principle of aviation piston power plant and aviation gas turbine power plant, be familiar with engine performance, grasp the basis of operation and operation, and be familiar with the basic treatment process and matters needing attention of engine failure, so as to provide flight training and navigation for the future. Line flight lays the necessary theoretical foundation. To successfully engage in the work of this major, students majoring in flight technology must pass the theoretical examination of pilots' license, including subjects such as private license, business license, airline and so on, in which power plant is an important part.

3. Problems

- (1) The teaching content is extensive. The course covers a wide range of subjects, including basic thermodynamic knowledge, composition and structure of piston engine, ignition system, fuel system, lubricating oil system, cooling system, propeller, aviation gas turbine engine, operation and control of power plant, etc. Basically, it only involves some general knowledge of the principle, and does not do specific research on a specific type of power plant. There are wide but inexperienced problems.
- (2) Lack of pertinence. The update of teaching content is not timely enough, mainly introduces the basic structure and principle of aero-engine. The structure and system of commonly used aero-engine in flight training are less involved, lack of pertinence, which is not conducive to the students later flight training. As a result, students are not interested in the knowledge taught in class, and their enthusiasm for learning is not high.
- (3) Insufficient docking with industry standards. According to the feedback from the licensing theory test, it can not completely cover the requirements of the outline, there are individual omissions, and the docking with industry standards is not close enough, there are still large deficiencies or deviations. In view of the particularity of flight technology specialty [2], besides the basic structure principle, there are still insufficient lectures on the operation and characteristics disposal of engine systems.
- (4) Teaching methods should not keep pace with the times. At present, the major of flight technology is still taught in large classes, usually about 80 people, using the method of face-to-face teaching in class, combining PPT with blackboard writing. Although the classroom will be explained according to students doubts or reactions, it still belongs to the mode of teachers teaching and students listening. Due to the lack of multimedia materials, vividness and attraction, students are generally sleepy and lack of concentration.
- (5) The effect of assessment is not ideal. The examination results of this course are composed of written examination results at the end of the term and performance results at ordinary times. The final exam score was 100 points, accounting for 70% of the total score. Peacetime performance score 100 points, accounting for 30% of the total score. Among them, the usual performance includes answering questions in class, observing discipline and homework after class. In recent years, despite the increase in peacetime performance and emphasis on process assessment, it still can not change the status quo of students sudden recitation before the final exam. Therefore, the final results can not show the normal state of the students, only rely on the pre-test assault can also achieve good results, resulting in loose peacetime, tight end of the term, can not fully reflect the situation of students knowledge, the assessment effect is not ideal.

4. Reform measures

- (1) Aiming at the problem of wide teaching content and insufficient pertinence, we should reduce the hours of basic theory and basic working principle of Aero-Power plant, increase the teaching content of specific type of aero-engine in flight training, and realize the close connection with students flight training.
- (2) Docking industry standards to ensure full coverage of the licensing examination syllabus. The course content is set strictly according to the admission standard requirements of CCAR-61-R4, Civil Aviation Driver and Ground Teacher Qualification Approval Rules, FS-ATS-004AR1, Airline Transport Driver Licensing Theory Examination Outline. At the same time, for the students majoring in flight technology, they should pay attention to the teaching of the control methods of engine systems. Therefore, they can refer to the training syllabus of various companies and integrate the contents of the training syllabus into the course teaching, so as to realize the industry standard into the classroom.
- (3) Reform the way of teaching. Firstly, small classes are used to teach, and no more than 30 people are required to set up teaching classes. This is conducive to the organization of teachers classroom teaching, give each student a full opportunity to show, so that the teacher's teaching is more targeted,

more in line with the characteristics of students to explain. Secondly, increase the use frequency of flight simulator, put more teaching places in the simulation flight laboratory. Teachers can stimulate students interest in learning and make knowledge teaching more vivid and attractive. They can avoid a series of problems such as dozing and inattention.

(4) Establish a process assessment system based on industry standards. In order to improve the practical ability and comprehensive application level of the students, the course learning process of the students should be changed from passive learning to active learning with motivation [4], avoid the sudden attack before the examination, strengthen the assessment of the students learning process, and further improve the proportion of the students normal grades to 50%, and the assessment time is the whole process from the beginning of the semester to the end of the semester. Make full use of self-developed pilot licensing examination system for theoretical examination, and use Cessna 172 simulator for power plant operation and control assessment, to achieve seamless combination of knowledge examination and ability and quality assessment. This can effectively avoid pre-examination surprise, guide students to show initiative and enthusiasm in the learning process, and activate the classroom atmosphere, so as to ensure a higher level of performance in peacetime, and ultimately realize the industrialization, standardization, whole-process and localization of the course assessment of Aeronautical power plant, and effectively assess the degree of students mastery of knowledge.

5. Conclusion

Aviation power plant course is a very important and practical course for flight technology specialty, which requires high control skills of flight cadets. Therefore, it is of great significance to combine the local industry standards and company training syllabus closely and provide enough simulators for training to ensure the teaching effect. Through the above teaching reform measures, we can effectively improve the pertinence of teaching content, adopt a new on-site teaching mode, integrate industry standards into classroom teaching content, establish a process assessment system based on industry standards, effectively improve students and apos ability to operate engines and deal with emergencies, so as to achieve the teaching objectives.

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