

Current situation and suggestions on the school-enterprise integration education mechanism for civil aviation majors

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Keywords: Civil aviation; Integration of enterprises with vocational schools and universities; Education mechanism; School-enterprise integration

Abstract: In order to meet the urgent demand for civil aviation talents in China, this paper takes the construction of civil aviation major in Changzhou Institute of Technology as an example, and studies the development status of the education mechanism of the modern integration of enterprises with vocational schools and universities for civil aviation major. This paper summarizes the development experience of the integration of enterprises with vocational schools and universities in foreign countries, and combined with the development status of China's civil aviation industry, it is suggested to build a semi-practice-semi-employment practice platform, and the government should grasp the baton of integration of enterprises with vocational schools and universities to achieve a win-win-win situation of students, schools and enterprises.

1. Introduction

Since the college entrance examination resumed in 1977, the higher education enterprise in our country has developed vigorously, trained a large number of high-level talents for the country's modernization construction and made great contribution to the great rejuvenation of the Chinese nation. However, with the rapid development of science and technology and various new industries springing up, the requirements for talents in all walks of life have also reached a new level. How to train high-quality talents suitable for the modern industrial system is a big problem that needs to be solved urgently under the background of the strategy of rejuvenating the country through science and education in the new century. Subsequently, The State Council issued the "Several Opinions of The General Office of the State Council on Deepening the Integration of Industry and Education" at the end of 2017, proposing to build an overall and integrated development pattern of education and industry, promote the reform of the integration of industry and education, and emphasize the main role of enterprises. Industry-education integration [1-2] is jointly carried out by the industrial system and the education system, and the education department (mainly colleges and universities) and the industry department (industries and enterprises) cooperate with each other by relying on their respective advantageous resources and taking project cooperation as the carrier. Its proposal provides an important way to solve the problem of "mismatch between supply and demand of talents" and

points out a new direction for higher education training mechanism in the new era.

However, the traditional exam-oriented teaching model has been difficult to meet the requirements of the rapidly developing society for talents. Therefore, it is of great significance to explore the emerging talent training mode under the background of the integration of enterprises with vocational schools and universities by referring to the development mode of the integration of enterprises with vocational schools and universities in foreign countries and considering the current development situation of the integration of enterprises with vocational schools and universities in China's higher education.

2. Present situation of integration of enterprises with vocational schools and universities in foreign countries

Developed countries such as the United States and Germany are also at the forefront of the world in the new mechanism of education integration. As early as the early 20th century, the United States began to implement the cooperative education model, which is also considered to be the origin of the integration of enterprises with vocational schools and universities model. Subsequently, universities began to shift from the early classroom theoretical education to focus on strengthening cooperation with enterprises, trying to break down the barriers between industry and the classroom. Based on the education concept of the integration of industry and education, foreign countries are typical of the cooperative education model of the United States, the dual system model of Germany and the industry-university-government cooperation model of Japan.

2.1 Cooperative education mode

The cooperative education model was first proposed by Professor Herman Schneider in the United States during his teaching at the University of Cincinnati. This model emphasizes the establishment of a cooperative relationship between schools, students and enterprises, which combines the theoretical knowledge of schools with the practice of enterprises, and allows students to switch frequently between classroom and practice, so as to cultivate new talents to meet the needs of enterprises [3].

The Cincinnati model breaks the original classroom teaching model, but it focuses on the practice in a single enterprise and has certain limitations. Subsequently, Antiac University made improvements on this basis and proposed the "Antiac model". This model advocates students to conduct practical activities in multiple enterprises, which is conducive to the cultivation of students' ability and improves the fault tolerance rate of cooperative education model.

With the proposal and continuous improvement of the cooperative education model, the US government has also provided strong support in terms of policies and funds, making the cooperative education evolve into a four-way training model, and the training quality has been significantly improved, thus promoting the prosperity and development of American industry.

2.2 Dual system mode

Dual system is a teaching mode proposed in the integration of enterprises with vocational schools and universities in Germany [4], which was born in 1948 and its predecessor was the apprenticeship system proposed as early as the end of the 18th century for the development of handicraft industry. This model requires students to play the dual roles of university students and enterprise employees at the same time, through the organic combination of theory and practice, and eventually cultivate composite talents to meet the development of the industry.

In order to achieve this goal, enterprises play a leading role in student education, that is, enterprises

should not only provide students with software and hardware conditions necessary for practice, but also send practitioners with solid skills to schools to take charge of practical teaching, while schools are mainly responsible for the basic theoretical work in the training process. The dual system model has been continuously explored and practiced in German higher education, which effectively promotes the continuous improvement of the concept of integration of enterprises with vocational schools and universities.

2.3 Industry-university-government cooperation

The industry-university-government cooperation mode is a teaching model proposed in Japan in the 1980s [5]. Since the middle of the last century, Japan's economic development has entered the fast lane mode, which makes the demand for talents increase sharply, but the traditional Japanese university education has been difficult to meet the needs of industrial development. Therefore, the Japanese government began to vigorously participate in the development of the education model of the integration of industry and education, and formed a government-led model that combines school training with industrial development.

The characteristic of this model is that the government plays a commanding role in the integration of industry and education, and guides the cooperation between schools and enterprises by issuing relevant policies as a baton. For example, the Japanese government issued the Industry-University Joint Research Policy and the University Establishment of Regional Joint Research Center policy successively in the 1980s, which broke the traditional classroom teaching model of Japanese universities and paid more attention to the connection between universities and enterprises. Under the guidance of the government, the integration of industry and education has not only further improved the strength of Japanese universities, but also made Japan's scientific and technological level in the forefront of the world in recent years.

3. Development status of the integration of enterprises with vocational schools and universities in civil aviation in China -- A case study of Aircraft Manufacturing Engineering in Changzhou Institute of Technology

Air transport is an indispensable means of modern long-distance transport of passengers and special goods. Since the beginning of the new century, China's civil aviation has been developing continuously, the scale of air transport has increased sharply, and major foreign airlines have entered China. The rapid development of the aviation industry requires a large number of skilled talents. In order to meet the urgent demand for civil aviation talents in our country, our university has added aviation majors such as aircraft manufacturing engineering and transportation in recent years.

After years of construction and implementation, and relying on Changzhou Institute of Technology's Production and Education integration experimental practice teaching demonstration base to build "intelligent manufacturing production and education integration practice and training base" and "Research and Practice of intelligent Manufacturing Collaborative education Model under the background of new engineering", our school has made remarkable achievements in the construction and practice of production and education integration training system for civil aviation majors.

3.1 The construction of innovative talent training model based on one "center", one "main line", three "combination"

Based on the training goals and concepts of application-oriented senior talents in our school, we have built a "center", a "main line" and three "combinations", namely student-centered, practice-

application training as the main line, the combination of in-class and extra-class, the combination of in-school and off-campus, and the combination of teaching and engineering, and gradually formed a unique innovative talent training model (see Figure 1).

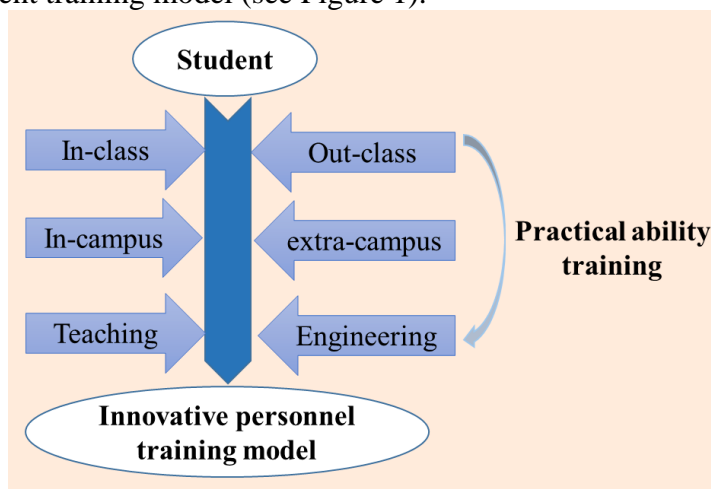


Figure 1: Innovative talent training mode based on a "center", a "main line", three "combination"

3.2 A comprehensive multi-dimensional practice and innovation platform

The law of "practice, understanding and re-practice" in the learning process is explored, and a comprehensive multi-dimensional practice innovation platform adapted to the core competence training of civil aviation talents is built (see Figure 2). The platform consists of four sub-platforms: open practice, professional associations, discipline competitions and industry-university-research cooperation. Each sub-platform in the platform is relatively independent and has its own system, which conforms to the law of students' knowledge acquisition, ability cultivation and quality improvement.

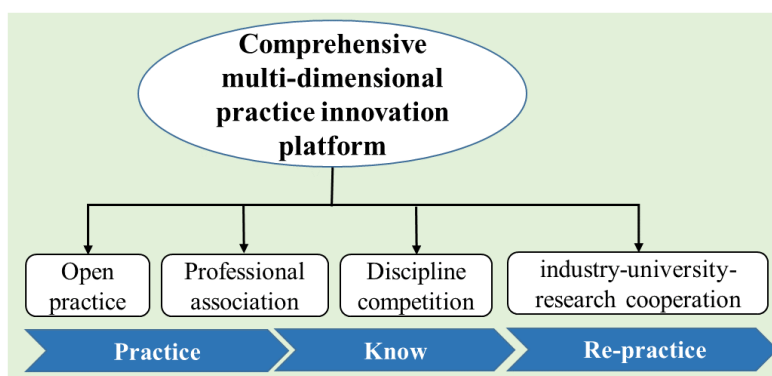


Figure 2: Comprehensive multi-dimensional practice innovation platform

3.3 Civil aviation students innovative education platform operation guarantee mechanism

Our school has comprehensively improved the system construction, organizational system, condition guarantee, incentive mechanism and effectiveness evaluation, perfected the series of documents suitable for the training of applied innovative talents in engineering, and effectively guaranteed the operation of the innovation platform of this specialty and the training quality of innovative talents.

4. Shortcomings and suggestions of existing education mechanism of civil aviation specialty

Although remarkable achievements have been made in the construction and practice of civil aviation professional training system, the current education mechanism still needs to be further improved. In addition to having a solid theoretical foundation, civil aviation talents also need to have a strong technical level, which needs to provide a large number of practice platforms in the training process. However, only relying on schools to build the platform is not enough. In addition, due to the rapid development of technology, the platform needs to be constantly updated and improved.

In order to solve the dilemma of the existing training link, this paper summarizes the development experience of the integration of enterprises with vocational schools and universities education mechanism in foreign countries, and on the basis of the development status of China's civil aviation industry, puts forward the following suggestions.

4.1 Creating a semi-practice-semi-work-based practice platform

Civil aviation enterprises have perfect civil aviation management system and strong hardware foundation, which can provide reliable guarantee in practice training. Enterprises can participate in the training of future employees according to their own needs and avoid the mismatch between supply and demand in the process of talent recruitment. In addition, students can smoothly enter their favorite enterprises and seamlessly adapt to work, and the school can also improve its own employment rate, thus achieving a student-school-enterprise win-win-win situation. Therefore, the training of civil aviation professionals needs the vigorous participation of enterprises.

4.2 The government should grasp the baton of integrating production and education

In the process of school-enterprise joint training, it is difficult to avoid the problem of coordination failure, such as the proportion of investment between the school and the enterprise, the proportion of profit distribution, and the protection of rights and interests of students in the practice process. Therefore, how to perfectly realize the joint training of schools and enterprises requires not only the support of government funds, but also the introduction of corresponding policies to coordinate the integration of enterprises with vocational schools and universities, and effectively protect the interests of all parties, especially students. From the development experience of developed countries, as long as the government grasp the baton of the integration of enterprises with vocational schools and universities, it can not only solve a large number of employment problems, but also significantly improve the national level of science and technology, so as to effectively enhance the international competitiveness of the industry.

5. Conclusion

After years of exploration and practice, a school-enterprise integration training system for civil aviation majors, which includes the innovative talent training model based on one "center", one "main line", three "combination", a comprehensive multi-dimensional practice and innovation platform, and civil aviation students innovative education platform operation guarantee mechanism, has been constructed.

However, the current education mechanism still needs to be further improved due to the need for a large amount of investment and the rapid development of technology. According to the development experience of the integration of enterprises with vocational schools and universities in foreign countries, a semi-practice-semi-work-based practice platform is needed to achieve a student-school-enterprise win-win-win situation. In addition, the government should grasp the baton of integrating

production and education to avoid the problem of coordination failure in the process of school-enterprise joint training.

Conflicts of Interest

The authors declares that there is no conflict of interest regarding the publication of this article.

Funding

This work was supported by the Natural Science Foundation of Jiangsu Province (Grants No. BK20230202), the Ministry of Education Industry-University Cooperative Education Project (No. 22107068045751), and Changzhou Institute of Technology "Curriculum Ideology and Politics" construction project (No. 30120300100-23-zd-jgkt02 and No. 30120300100-23-yb-sfk01).

Acknowledgements

The authors are very grateful for the support provided by the funding, and also thanks to the Department of Aeronautical Manufacturing Engineering of Changzhou Institute of Technology for the information provided.

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