

Research on the Cooperative Education Mode of Civil Aviation Transportation Specialty under the Background of Emerging Engineering Education

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Abstract: Under the background of Emerging Engineering Education, it has become an important part of engineering education to cultivate civil aviation transportation talents with strong engineering practice ability and innovation ability. This research takes the civil aviation transportation specialty as the research object, focuses on the fundamental task of establishing morality and cultivating people, explores the multiple collaborative education platform of universities, governments, enterprises and industries, realizes the educational connotation development of civil aviation transportation specialty under the background of new engineering disciplines and improves the quality of talent training, and makes use of the industry advantages jointly built by provinces and ministries to organically combine the aviation economy and industrial structure with the development of higher education and disciplines.

Keywords: Emerging Engineering Education, Civil aviation transportation, Cooperative education.

1. Introduction

"Emerging Engineering" is a new direction of engineering education reform in China based on the new requirements of national strategic development, the new situation of international competition and the new requirements of establishing morality and cultivating talents.[1-3] Engineering education in colleges and universities in China has gone through different stages of development, and the construction plan of "Emerging Engineering" was first proposed in early 2016. The educational concept of "Emerging Engineering" is obviously different from that of traditional engineering. It is proposed that the training of new engineering talents must be based on the needs of the industry and set goals according to the needs. This concept effectively solves the problem that the content of the traditional engineering education practice module lags behind the industrial development.

The civil aviation industry is characterized by technology intensive, safe production and operation requires high level of civil aircraft R&D and manufacturing, strong industry systematicness and internationalism. The industry covers a wide range, covering the main markets of the whole civil aviation industry chain, such as air transport, airport construction, airport economy, air traffic control equipment, satellite communications, airworthiness certification, aviation finance, aviation security, aviation education and culture. The school enterprise cooperation closely combines industry and teaching, supports and promotes each other, and turns the school into an industrial operation entity integrating talent training, scientific research and scientific and technological services, forming a school running mode that integrates school and enterprise.

The development of industry university research cooperation is a new model and an important platform for civil aviation talent training. It is a joint participation of universities, competent government departments, civil aviation enterprises and other departments. In the process of civil aviation talent training, civil aviation universities and enterprises and institutions have deep cooperation and clear division of labor. The quality of civil aviation talent training is improved from three aspects: practical teaching system, practical teaching content design, and practical teaching process implementation, and the barriers between universities and enterprises are broken, Effectively allocate and integrate resources, form diversified and in-depth cooperation, release resources, talents, information, technology and other elements of the industry, and improve the integrated ecological chain of civil aviation industry and education[4-6].

2. Related Overview

2.1. Emerging Engineering

Emerging Engineering refers to a deepening reform and development initiative around the education of engineering courses in colleges and universities. The proposal is intended to respond to a new round of industrial reform and scientific and technological revolution in China, It is used to form a supporting service effect for a series of national industrial and economic development strategies such as "Made in China 2025" and innovation driven development. Since February 2017, under the joint role of the Ministry of Education, universities and enterprises around the country, the construction of Emerging Engineering has been gradually promoted in all parts of the country. "Fudan Consensus", "Tianda Action" and "Beijing Guide" As a trilogy of new engineering construction, it officially started a new journey of

engineering education reform in China[7-9].

The education concept of "Emerging Engineering" is proposed according to the needs of China's scientific and economic development. Its education concept is obviously different from the traditional engineering education concept. It is proposed that the training of new engineering and technical talents must be based on the needs of the industry and set the training objectives according to the requirements of the industry. This idea of "Emerging Engineering" effectively solves the problem that the content of traditional engineering education practice module lags behind the industrial development. The air transport industry is characterized by technology intensive, high requirements for safe production and operation, and internationalism. College personnel training should explore the training mode of civil aviation transport professionals under the background of Emerging Engineering according to the development status of the air transport industry and the needs of high-quality composite talents.

2.2. Cooperative education

As the last stop for students to go to work, colleges and universities play a vital role in the process of educating people. From cooperative education, trinity collaborative education to production, teaching and research collaborative education, the educational reform of colleges and universities has developed into the concept of in-depth collaborative education, gradually moving from theoretical research to social practice. Many scholars have carried out research from different perspectives such as the meaning, mode, mechanism, curriculum and teaching construction of collaborative education. For example, the collaborative education mode is divided into the combination forms of school, school, school institute, school enterprise, school local collaborative education according to the different participants; According to the number of participants, it can be divided into two modes: dual mode and multiple mode; According to the cooperation content, it can be divided into collaborative education models based on cooperation projects, based on practice bases, and based on teaching forms. However, as the key method of the construction of new engineering disciplines, collaborative education still has some weak links, lacks motivation, and has imperfect mechanisms such as cooperation mechanism, management mechanism, incentive mechanism, and evaluation mechanism[10-11].

2.3. Training requirements for civil aviation transportation talents

(1) Composition of civil aviation transportation talents

Air traffic control refers to the use of communication, navigation technology and monitoring means to monitor and control aircraft flight activities to ensure the safety and efficiency of aviation activities.

Dispatching is to reasonably organize, arrange and guarantee the safety of air transport activities according to the operation tasks of airlines, and improve the operational efficiency of aircraft, the quality of aviation services and the economic benefits of airlines.

Both controllers and dispatchers are those who have the required knowledge, skills, experience and qualifications and are engaged in specific jobs. In addition, civil aviation transportation talents also include airport operation

management personnel, mainly ensuring aircraft operation management and slot allocation at the apron.

(2) Training objectives

Cultivate the basic quality and ability required by controllers and dispatchers, be familiar with the domestic and foreign industry and professional development trends, have aviation safety awareness, strong practical ability, rigorous style and cooperation spirit, and be high-quality and compound engineering management talents with high skills, high technology, high quality, internationalization and standardization.

(3) Graduation ability

Graduation requirements mainly include knowledge structure requirements, skill structure requirements, ability structure requirements and quality structure requirements. The requirement of knowledge structure is not only profound professional knowledge, but also extensive knowledge, and a reasonable and complete knowledge system to meet the actual needs of career development. Skill structure requirements, the action mode formed through practice, and the control behavior and decision-making conform to the civil aviation regulations and operation specifications. Competency structure requirements, the combination of various abilities required to complete the job requirements. Quality structure requirements, and comprehensive requirements for political quality, professional quality and professional quality of the work.

At present, there are still some problems in the training of postgraduate talents in civil aviation transportation in China, such as the management mechanism of postgraduate talents needs to be further innovated, the coordination between high-end talent supply and industrial development needs needs to be further strengthened, and the level of scientific research cooperation and opening up needs to be further improved. Therefore, how to deepen the reform of civil aviation professional education, improve the quality of talent education, and adapt to the needs of industry development has become an important bottleneck for the healthy and rapid development of the civil aviation industry in our province and even our country. At present, the Ministry of Education is strengthening the construction of new engineering, new agricultural, new medical and new liberal arts, and the educational concept of "politics, industry, learning, research and application" is also in full swing. Both of them emphasize the practicality of discipline construction, cross integration and innovation, which reflects the new round of scientific and technological industry revolution and development on the quality of talent training.

3. The Idea of Pluralistic and Cooperative Education

Under the background of the new engineering discipline, with the reform of the system and mechanism as the driving force, the training of high-quality talents as the goal, the engineering practice teaching as the starting point, the civil aviation transportation specialty as the research object, and closely around the fundamental task of establishing morality and cultivating people, we constantly explore the diversified and collaborative education mechanism of universities, governments, enterprises and industries, Realize the connotative development of civil aviation transportation

education and the substantial breakthrough in improving the quality of personnel training under the background of new engineering, and make use of industry advantages to organically combine aviation economy and industrial structure with higher education and discipline development. The main ideas are as follows:

3.1. Building a Multi element Collaborative Education Platform

The effectiveness of collaborative education depends to a large extent on whether the multi subject of "government, industry, university, research and use" can establish a scientific and efficient operating mechanism. From the perspective of resource allocation, collaborative education mechanism, operation mechanism, etc., through the aggregation mechanism of strategic identification, win-win interests, resource sharing, and complementary advantages, we will build a "government, industry, university, research and use" multi collaborative "co construction, co management, and sharing" collaborative education platform, clarify the responsibilities and rights of the participants, strengthen the organizational system and model among the multiple subjects, combine production, teaching, scientific research and practical application, and promote collaboration Open schools.

3.2. Improve the operation system and mechanism of collaborative education

(1) Following the needs of the construction of new engineering disciplines, focusing on the needs of the development of the civil aviation industry of the country and Henan Province, the multi-disciplinary entities should work together to build the discipline direction setting, talent training objectives, training programs, curriculum systems, experimental training systems, etc. that meet the actual needs of the civil aviation industry. With new concepts, new models, new methods, new standards, etc. as the guiding concepts, we should break the professional boundaries and focus on multidisciplinary integration and innovation, Enhance the compatibility between the supply of civil aviation transportation talents and the development needs of the industry.

(2) Develop the evaluation system and monitoring evaluation system for the teaching quality of the collaborative education of civil aviation transportation, including the evaluation indicators, standards and related processes, the whole process, diversification, quality orientation, process first, and diversified innovation to evaluate and supervise the implementation of the training quality of civil aviation transportation graduate students, and gradually form a long-term operating mechanism with closed feedback and dynamic optimization.

3.3. Improve the Cooperative Education Guarantee Mechanism

Improve the theoretical system and implementation path of the policy industry university research cooperation education model for civil aviation transportation graduate students under the background of new engineering. Put forward reform measures for civil aviation professional talents education from the aspects of policy support, teaching staff, platform construction, practice base construction, and system guarantee.

4. Basis and Conditions for Carrying Out the Cooperative Education of Production, Teaching and Research

4.1. Integration of politics and learning: jointly built by the province and the ministry.

For many years, according to the national strategic needs and the needs of local economic and social development, colleges and universities across the country have actively promoted the cooperation between political schools, actively expanded the good interaction with relevant government departments, and closely connected with local governments. Through the joint construction of Henan Province and the Civil Aviation Administration of China, it has promoted the transformation of the service orientation of our school, promoted the effective connection between the school's discipline advantages, teachers' advantages and the aviation resources in Zhengzhou region, jointly promoted the development of the civil aviation industry, promoted the construction of Zhengzhou Airport Comprehensive Pilot Zone, and promoted the adjustment of the local economic structure and the transformation of the growth mode.

4.2. Integration of production and learning: the university and enterprise are a community of interests sharing weal and woe and sharing weal and woe.

For a long time, civil aviation colleges and universities have shared the same breath and destiny with the industry, based on the industry and service industry, closely followed the requirements of industry development, and guided advantageous disciplines to actively provide scientific and technological support for industry development. Civil aviation colleges and airlines should strengthen comprehensive cooperation in science and technology research and development, engineering practice, talent training and other fields, gather first-class talents and first-class resources, solve the common and key technical problems in the safety production of the civil aviation industry, promote the scientific and technological progress of the civil aviation industry, constantly improve the safety production level of civil aviation, cultivate practical high-end talents for the civil aviation industry, and comprehensively improve the scientific and technological innovation ability of the industry.

4.3. Integration of application and learning: promote the transformation of scientific and technological achievements and serve the society.

Civil aviation colleges and enterprises have deepened industry university research cooperation, accelerated the transformation of scientific and technological achievements into real productive forces, achieved a large number of significant landmark achievements, achieved significant economic and social benefits, and effectively promoted the development of the civil aviation industry.

4.4. Integration of research and learning: promote the deep integration of education and scientific research.

The university actively deepens cooperation with civil aviation universities and scientific research institutes,

explores the establishment of an institutional mechanism for sharing and coordinating high-quality educational resources around the frontier of discipline development and strategic high-tech fields, gathers large teams and builds a large platform, jointly builds a superior discipline system through the establishment of a resource sharing mechanism, increases the exchange of scientific and technological innovation achievements, and fully promotes the high-level convergence of various innovative elements, Form a common advantageous discipline cluster.

5. Main Tasks of the Production University Research Cooperation Education Platform

5.1. Scientific research cooperation

First, universities, scientific research institutions and enterprises jointly carry out basic research, jointly undertake key projects, and jointly build high-level scientific research platforms and engineering centers. Second, universities, scientific research institutions and enterprises have jointly obtained original and high-level scientific and technological achievements in basic theories, key technologies and core equipment. Third, universities, scientific research institutions and enterprises should jointly build an industrialization pilot platform, improve the maturity, integration and innovation of scientific and technological achievements, and realize the transformation from "laboratory technology" to "industrial technology". Fourth, universities, scientific research institutions and enterprises, under the leadership of the state and industry, jointly participated in drafting relevant industry, technology, management and other standards, and jointly applied for various relevant qualifications. Fifthly, universities, scientific research institutions and enterprises share profits and develop continuously.

5.2. Talent cultivation

The first is to explore the enrollment reform plan. Universities, scientific research institutions and enterprises jointly recruit students independently, target training and order training talents. The second is to explore the reform plan of talent training mode, and carry out 3+X, 2+X school enterprise joint training and school enterprise double tutor training pilot. The third is to implement the plan of improving practical ability and promote the joint construction of engineering practice education base, talent training base, practice base and experimental teaching demonstration center by universities, scientific research institutions and enterprises. The fourth is to promote the international talent cultivation plan, cooperate with foreign first-class universities and research institutions, and carry out half a year to two years of study visits and joint cultivation of professional masters and doctors. Fifth, plan to establish various special talent training funds.

5.3. Vocational education and professional training

We will increase efforts to promote the education and training of enterprise employees, use universities, enterprises and other resources to organize and promote multi-level, systematic, professional vocational education and short-term professional training for managers, technical backbones, grass-roots workers and other personnel, so as to improve the comprehensive ability of enterprise staff.

5.4. Scientific and technological achievements and intellectual property rights

First, research incentive mechanisms, stimulate the innovation vitality of scientific and technological personnel, improve the transformation rate of scientific and technological achievements, and enhance the industrial technology level. The second is to cooperate with specialized intellectual property agencies such as China Technology Exchange to open a special window platform for evaluation, authorization and transfer of scientific and technological achievements and intellectual property rights, and to conduct market-oriented operation. The third is to give play to the role of colleges and universities as a link between the preceding and the following, cooperate to undertake the transformation of some existing achievements, and accelerate the transformation of scientific research achievements into productive forces.

5.5. Information statistics and resource sharing

First, according to the continuous development and change of the civil aviation industry, we will go deep into the field investigation and research of the airline production line, monitor and track the needs of all aspects, improve the use efficiency of resources, and provide advice and basis for decision-making. The second is to promote the opening of resources of schools, scientific research institutes and enterprises, especially the sharing of existing key laboratories, engineering centers and scientific research equipment, promote the joint establishment of public technology platforms and production practice bases, carry out public testing, talent training, information consulting and other services, and meet the sharing needs of all parties for scientific and technological resources.

5.6. Innovation and entrepreneurship services

Make full use of the advantages of science and technology parks, industrial bases and other resources to build an incubation platform for scientific research achievements with good industrialization prospects, and provide services such as entrepreneurship, information and market development. Specifically, it includes providing entrepreneurial space, providing services such as industry and commerce, financial agency, tax planning, fund application, personnel agency, etc., providing consultation on intellectual property, human resources, marketing, enterprise management, public policy, etc., carrying out market promotion, guiding social capital, setting up venture capital funds, tracking, evaluating and investing in scientific and technological achievements and enterprises.

6. Ideas and Suggestions on Building a Platform for Industry University Research Cooperation

6.1. The Regulatory Bureau takes the lead to integrate resources and innovate the working mechanism of industry university research cooperation.

We will establish an innovative working mechanism led by the Regulatory Bureau, in which universities, research institutes, and enterprises work together and develop interactively. The Regulatory Bureau should play a leading

role in formulating strategic plans and major policies for cooperative development, coordinating major cooperation projects, etc. Colleges and universities and scientific research institutions should focus on the basic research and development of high-tech, and provide the latest technology and research results; Enterprises should focus on the research, development and innovation of applied technologies.

It is suggested that Henan Civil Aviation Dispatch Industry University Research Cooperation Committee be established to be responsible for the guidance and coordination of industry university research cooperation and solve relevant major problems. The committee office can be located in Zhengzhou Institute of Aviation Industry Management, and each member unit is responsible for the specific implementation of the industry university research cooperation to ensure that all work of the industry university research cooperation is implemented.

6.2. Led by the alliance, promoted as a whole and guided the gathering of industry university research cooperation platforms.

It is suggested to take the industry university research cooperation as a platform, mainly government officials, colleges and universities, scientific research institutions, entrepreneurs, experts and scholars associated with the industry university research cooperation in the industry, education, science and technology, academia, and workers who are enthusiastic about promoting the industry university research cooperation, to establish an industry university research strategic alliance. Through the contractual relationship between the members of the industry university research alliance, in accordance with the principles of joint investment, joint development, benefit sharing, and risk sharing, Establish various technical research institutes, promote the effective combination of enterprises, colleges and universities, and scientific research institutes, and promote the rapid development of the construction of industry, education and research platforms.

6.3. Intensive cultivation, detailed measures and in-depth development of industry university research cooperation.

For large enterprises and large-scale enterprises, the Regulatory Bureau should actively guide, play a role as a bridge, carry out various forms of industry university research cooperation docking activities, closely connect universities, research institutes and enterprises, and establish a good strategic cooperation relationship. Formulate special policies to promote industry university research cooperation, and encourage enterprises to carry out industry university research cooperation. Policy support will be given in patent application, standard formulation, government procurement and other aspects for enterprises, colleges and universities, scientific research institutes to jointly develop their own technologies, brands, and industry standards.

7. Conclusion

Establish a multi-party collaborative platform for the collaborative innovation of civil aviation transportation, coordinate the common development of experts in related disciplines, academic production, academic research, integrate multiple resources and achieve sharing, break the

talent training mode of "single discipline and single teaching platform", and build a new engineering talent training mode of "multi-disciplinary cross and multi platform". Under the background of the new engineering discipline, with the reform of the system and mechanism as the driving force, with the training of high-quality talents as the goal, and with the engineering practice teaching as the starting point, we should closely focus on the fundamental task of establishing morality and cultivating talents, break the traditional single education model with universities as the main body, and build a multi collaborative education mechanism of universities, governments, enterprises and industries. At present, the focus is on the practical teaching of college students in enterprises. Colleges and universities have a clearer talent demand for enterprises, a clearer employment standard for enterprises, shorten the adaptation period for enterprises to recruit talents and improve the employment rate of college graduates.

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3.The Provincial Project of Innovation and Entrepreneurship Training Program for College Students (202210485041): Low-altitude guardian-low-altitude integrated service platform based on ADS-B system.

4.2022 Research and Practice Project on Educational and Teaching Reform of Zhengzhou University of Aeronautics (zhjy22-82).

5.2022 Special Subject Construction Project of Zhengzhou University of Aeronautics(2022YJSXK09): Exploration of Master's Collaborative Education Model of Civil Aviation Transportation under the Background of New Subjects.

6.Laboratory opening project in the second semester of the 2021-2022 academic year (No.: 21).

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