

Exploration of the Focus of Aeronautics and Astronautics Specialty Construction under the New Engineering System

YIN Xueai^{[a],*}

^[a]Lecturer, College of Aeronautical Engineering, Binzhou University, Binzhou, China.

*Corresponding author.

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Abstract

Under the new engineering system, the construction and development of aeronautics and astronautics specialty under the new engineering system must closely follow the development of the modern society and the needs of the industry. We should needs. This study aims to explore the focus of the specialty construction, reform and remodeling, pursue the curriculum design with international industry standards as the core, establish the unique talent cultivation system oriented to the specific requirements of industry companies, and build the cultivation mode that targets high-quality special talents. In addition, based on the present situation and professional attributes, this study explores the focus of the construction of aeronautics and astronautics specialty in the new era to be service-oriented and employment-oriented, comprehensively strengthening the close collaboration between colleges and enterprises, and formulate the long-term development mechanism for a win-win cooperation between the two parties.

Key words: New engineering; Aeronautics and astronautics; Specialty construction; Focus

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INTRODUCTION

Boeing's report of *Forecast of Chinese Market 2002* projects that in the next 20 years, China will become the world's second-largest aviation market, requiring over 2400 new aircraft and, at least, 240,000 civil aviation talents. Notably, the development speed, scale, and potential of China's aeronautics and astronautics industry in the new era cannot be undervalued, especially when the scientific research and production in the aeronautics and astronautics field under the new engineering system is witnessing a new period of swift development and progress, which is full of infinite possibilities and development potentials. Thus, the construction and development of aeronautics and astronautics specialty are imperative.

1. PROFESSIONAL COURSE SETTING WITH INTERNATIONAL INDUSTRY STANDARDS

Curriculum is the cell of a specialty, and the construction of the curriculum system ascertains the fundamental structure of specialty construction. Reportedly, the construction results directly influence the creation of professional characteristics and the enhancement of teaching quality. Thus, the primary focus of aeronautics and astronautics specialty construction is to pay attention to the professional courses, follow the breadth of the times and the depth of theory, and execute the professional course setting and teaching system reform with international standards. It is essential to learn from the advantages of the aeronautics and astronautics industry in the world and follow the progress of changes in the international industry standards. Thus, the teaching process should focus on using real engineering and actual

products, as well as integrate advanced professional requirements, level standards, and technical specifications. This study aims to closely and seamlessly connect the teaching and production in the effective implementation of engineering-theory unification, communication, interaction, and win-win cooperation.

1.1 Selection and Reform of the Teaching Content

Curriculum is the foundation for harnessing students' professional ability. The teaching content directly ascertains the students' professional ability and comprehensive literacy. Thus, the choice, reform, and innovation of the teaching content play an irreplaceable role for students' future employability, which undertakes a major responsibility for students to further their study and follow-up work with a sound knowledge reserve. Curriculum construction is the top priority to enhance the soft power construction of aeronautics and astronautics specialty, and the selection, reform, and enrichment of teaching content are vital in setting the professional courses with international standards. The courses of aeronautics and astronautics specialty cover a broad range, and the curriculum system is sophisticated. The professional courses include several disciplines like mechanics, aircraft power engineering, and mechanical engineering. Thus, the teaching content should be defined on the basis of special, backbone, and related subjects to create and augment the systematic and scientific curriculum connection system. In addition, it is imperative to adapt to the current situation, industrial development, and technological progress to establish a joint unified mechanism of professional teaching and employment requirements with international standards. Meanwhile, a long-term mechanism should be established that relies on the development of industrial technology to stimulate the reform of professional courses and the reform of teaching content based on the development of science and technology.

The selection and reform of the teaching content should follow two main principles. First, the teaching content should adapt to the specialty characteristics. Primarily, the aeronautics and astronautics specialty aims to nurture practical application-oriented talents. In the new era, we must adapt to the development trend of swift development, interdisciplinary fusion, and interactive fields of the aeronautics and astronautics specialty to actively select, fuse, and innovate the related courses of aeronautics and astronautics specialty. Second, the primary content of professional courses should focus on the specialty characteristics and the students' interest and acceptance. Of note, courses should be chosen that are appropriate for the actual situation of the students majoring in aeronautics and astronautics, highlight the practical application examples, and integrate the latest accomplishments of science and technology in the

aeronautics and astronautics industry throughout theory teaching and skill training.

1.2 Optimization and Perfection of Teaching Methods

The optimization and perfection of teaching methods should be performed according to the characteristics of the specialty, students, and colleges, which is essential to accomplish the cultivation objectives, attaining teaching tasks, and enhancing teaching quality. In addition, the teaching methods should be continuously enriched, optimized, and perfected in the process of innovating the teaching concept, reforming the course content, and augmenting the practical ability.

First, the practical teaching mode should present the actual work. The traditional teaching mode largely based on the theoretical indoctrination and direct content teaching is no longer suitable for the practical teaching mode directing at the cultivation of applied and innovative talents in the new era. The primary line of the teaching reform of the aeronautics and astronautics specialty in the new era highlights the need to reinforce practical teaching tasks that could better depict and fit the actual work, and focus on training students' practical operation ability, thinking, and analytical ability to examine and solve problems, and the comprehensive literacy ability to integrate into society. Furthermore, it should focus on training students to become comprehensive, innovative, and social high-quality talents in the aeronautics and astronautics industry.

Second, the experimental equipment should exhibit professional attributes. Currently, the aeronautics and astronautics specialty is focusing on the construction of a platform for college-enterprise cooperation. By consolidating the cooperation training system between the two parties, the enterprise's funds, technologies, equipment, and other practical skills can be used to give full play to the college's advantages in theoretical foundation, scientific research, and technological methods. Accordingly, we can achieve a win-win mode of college-enterprise cooperation under the convenient soft and hard resources. Besides using the enterprise's experimental equipment, we must increase the college's investment in the experimental equipment and scientific research technology for the aeronautics and astronautics specialty, and proactively configure the experimental equipment and construct basic training room based on the actual needs of teaching and scientific research. Moreover, the undergraduate teaching laboratories of aeronautics and astronautics specialty should focus on not only the number of platforms in their college but also in the entire college community, related Chinese enterprises, and related foreign university laboratories and enterprises. Furthermore, we should completely strengthen the collaboration between colleges and enterprises and international exchanges, effectively reinforce the sharing of resources, workforce

and equipment to attain a win-win situation in teaching, scientific research, cooperation, and benefits.

2. SPECIAL TALENTS CULTIVATION SATISFYING THE REQUIREMENTS OF ENTERPRISES

The talents refined by the traditional training mode are relatively weak in terms of international perspective, international exchange ability, professional knowledge structure, management ability, and innovative thinking, and they cannot acclimatize to the international development goal of implementing international-standard aeronautics and astronautics education. Based on the enterprises' requirements in the aeronautics and astronautics industry, cultivating professional and special talents is a must, which is one of the focuses of the construction of the aeronautics and astronautics specialty in the new era. Of note, talent cultivation is the guide and objective of teaching operation, and it is a direct requirement with scientific, rational, systematic, and feasible characteristics that are based on the features of the times, discipline, and demand. The method not only ascertains the entire process of talent cultivation for the aeronautics and astronautics specialty but also directly correlates with the development future and construction quality of the specialty. Thus, the grooming of professional talents fulfilling the enterprises' requirements is the core of the aeronautics and astronautics specialty construction and the essence of the specialty development. Of note, this process should always focus on the development trends of the world and China, as well as the needs of talents in the enterprises, actively observe, auscultate, and consult the related information, and update the plan of professional talent cultivation in the scientific diagnosis and comprehensive research, to decisively construct the foundation of specialty construction and ensure the stable development of the specialty.

2.1 Talent Cultivation Mode With the Combination of Engineering and Theory as the Core

The focus of the current aeronautics and astronautics specialty is the talent cultivation mode with the combination of engineering and theory as the core to adapt to the development of the times and requirements of the industry to construct superior specialty, characteristic specialty, and brand specialty. According to the specialty characteristics, the talent cultivation of the combination of engineering and theory can especially focus on the construction of a superior specialty with robust development momentum, compress the saturated specialties with oversupply, and fine-tune the specialties that are not well connected to the industry needs. Accordingly, under the actual situation of facing the market, facing the industry, and the reality of *survival of*

the fittest, we can focus on financial resources, material resources, and human resources to follow the trend and move to work collectively to construct a specialty with promising development prospects.

2.2 Talent Cultivation Scheme Oriented by Industry Demands

The talent cultivation scheme oriented by industry demands aims to increase the teaching level, highlight the industry characteristics, and improve the employment quality based on the industry demands to provide high-quality and highly skilled professional talents for the industry enterprises. Thus, while formulating and implementing a specific talent cultivation scheme, we should focus on industry needs and corporate requirements to conduct specific analysis, multifaceted considerations, and comprehensive assessment of future career orientation and position needs. Then, we can develop professional courses and practical content for student cultivation, organize the professional expert team to conduct analysis, inspection, formulation, and modification and make reasonable, appropriate, and timely adjustments to the talent cultivation scheme. Moreover, it is essential to create the mechanism of operation management and inspection and supervision for the talent cultivation scheme, completely mobilize and give full play to the work responsibilities of the teaching work committee of the college, and regularly modify, adapt, and optimize the talent cultivation scheme based on the development and practical needs of the industry, as well as use new thinking, novel methods, and latest systems to advance the work of talent cultivation that face the times, industry, and development. Hence, we should completely use the technical advantage and resource platform of college-enterprise cooperation to multiply the capital investment and workforce of enterprises to participate in the formulation of talent cultivation scheme. Furthermore, the talent cultivation scheme formulated from the perspective, ideas, and logic of the industry is more conducive to satisfying the demand and augmenting the quality.

3. PRACTICAL TEACHING CULTIVATION AIMED AT HARNESSING PROFESSIONAL ABILITY

In the new era, the teaching methods and tasks of the aeronautics and astronautics specialty should be completely reformed, innovated, and reshaped, compared with the traditional teaching mode of "theories first, practice second," which should be based on the development trend and industry enterprise needs of the industry. In addition, effective adjustment and implementation of practical teaching should be performed targeting professional ability and following the development trend of the new era.

3.1 Practical Teaching Positioning With Clear Objectives and Levels

The teaching mode in the new era should be based on clear objectives and needs, reasonably hold the relevant industry standards and professional skills, aim at harnessing students' professional ability, and create and improve relevant professional practice teaching systems. Based on the progressive steps of "basic professional skills→special technical skills→post-specific skills," we should develop practical teaching cultivation scheme targeting the development of students' comprehensive abilities and professional qualities. Besides, multilevel practical teaching can not only consolidate the theoretical knowledge learned in class, broaden students' horizons, and harness students' technical capabilities but also enable students truly experience the professional characteristics and the charm of the industry in the organic process of integrating theory with practice. Moreover, the accumulation and precipitation of enhancing practical ability and enriching practical experience lay a solid foundation for grasping excellent professional abilities and business skills in the future.

3.2 Practical Teaching Expansion For Enhancing the Depth and Breadth

New situations, such as interactive exchanges and project cooperation with Chinese and international institutes, offer new opportunities and platforms for specialty development and student cultivation. Thus, it is essential to reinforce the breadth and depth of practical teaching to expand the horizon to the international field, and learn and introduce advanced theoretical knowledge, technical processes, and practical teaching systems from the world. Then, we should aim at localized adjustment, enhancement, and application to the advanced, scientific, and systematic teaching mode learned from the world, thereby improving the mode and method of practical education in China. Moreover, we must proactively establish and strengthen comprehensive exchanges and cooperation with international enterprises, and nurture excellent professional talents with international competitiveness in the process of intensifying the college-enterprise cooperation.

CONCLUSION

Strengthening the construction of the aeronautics and astronautics specialty in the new era warrants grasping

the pulse of the times, focusing on the specialty characteristics, facing the industry needs, and executing professional construction, transformation, and remodeling with clear objectives, focus, and levels. Hence, we should ultimately make the specialty larger, more exclusive, and more robust in the process of service-oriented and employment-oriented college-enterprise cooperation to enable the specialty to keep pace with the industrial development, conform to the international industry standards, and nurture highly qualified and talented talents.

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