

Research on the Training Model of Civil Aviation Innovative Talents under the Background of Innovation and Entrepreneurship

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Abstract

The article explores the mechanism of cultivating innovative talents in civil aviation under the background of innovation and entrepreneurship, focusing on the new model and paradigm of talent cultivation in civil aviation. Drawing on the construction experience of innovation and entrepreneurship laboratories in domestic and foreign universities, promoting the dual integration of science, education, industry, and education in the cultivation of innovative talents in innovation and entrepreneurship laboratories can solve the problems of weak teaching staff, small coverage, lack of interdisciplinary intersection, form exceeding content, and insufficient achievement transformation in talent cultivation. The article constructs a project-based (PBL) innovation and entrepreneurship teaching model, creating an innovation and entrepreneurship experimental platform for the dual integration of science, education, industry, and education in civil aviation. It proposes a new paradigm and plan for cultivating top-notch innovative talents through the dual integration of science, education, industry, and education in the future innovation and entrepreneurship laboratory.

Keywords

Innovation and entrepreneurship, Civil aviation, Talent training models, New solutions.

1. Status and Problems

The world today is experiencing unprecedented changes, with the wave of technological revolution sweeping across the world. Innovation has become the primary driving force behind technological progress and economic and social development. Innovation and entrepreneurship ability has become an important benchmark for measuring a country's comprehensive strength. The civil aviation industry is an important strategic industry for China's economic and social development. As an important source of innovation and entrepreneurship, universities serve as an important battlefield for cultivating innovative and entrepreneurial talents. Cultivating civil aviation innovative and entrepreneurial talents that adapt to the development and progress of the times has become a key strategy for building an innovative country.

Cultivating innovative talents who break through the "from 0 to 1" paradigm is not only the mission of talent cultivation in universities, but also an urgent need for industry development. The innovation and entrepreneurship education in universities has added fresh blood to economic and social development, and also injected strong impetus. Against the backdrop of high national attention, our school has established an innovation and entrepreneurship center, offered innovation and entrepreneurship courses, and organized innovation and entrepreneurship competitions, forming a strong atmosphere of innovation and entrepreneurship. This has played a good role in promoting the overall leap of our school's innovation and entrepreneurship strength. However, in the process of innovation and entrepreneurship education for college students, some problems have also been exposed.

1.1. Relatively Weak Teaching Staff For Innovation And Entrepreneurship

The teaching staff for innovation and entrepreneurship are relatively weak and have not yet formed a joint force in innovation and entrepreneurship education. Although our school has launched innovation and entrepreneurship education, a practical problem we face is the lack of professional innovation and entrepreneurship teachers. Some innovation and entrepreneurship teachers lack experience and experience in working in enterprises, and can only carry out innovation and entrepreneurship education on paper. At the same time, our school has attempted to hire some experienced entrepreneurs or management personnel who work in enterprises to serve as innovation and entrepreneurship mentors on campus. Through this approach, college students can directly obtain vivid education on innovation and entrepreneurship. However, this guidance is often conducted in the form of lectures, without forming an effective education and teaching system.

1.2. Inadequate Connection Between Theoretical And Practical Teaching In Innovation And Entrepreneurship Education

The connection between theoretical and practical teaching in innovation and entrepreneurship education is not smooth, and an organic interaction between theory and practice has not yet been formed. Our school has offered relevant innovation and entrepreneurship education courses, ensuring credit hours. Theoretical teaching has been carried out vividly, and students have also learned some innovation and entrepreneurship knowledge in the classroom. However, these knowledge often only stays at the theoretical level, lacking practical application scenarios and practical experiences. The lack of practical teaching and the lack of scenarios and platforms for innovation and entrepreneurship education among college students make it difficult for them to digest, understand, and apply innovation and entrepreneurship knowledge, transform theoretical knowledge into practical actions, and effectively enhance their practical skills and problem-solving skills.

1.3. The Transformation Of Entrepreneurial And Entrepreneurial Achievements Is Relatively Insufficient

The innovation and entrepreneurship competition has achieved fruitful results, but the transformation of results is relatively insufficient. Against the backdrop of the country's emphasis on innovation and entrepreneurship education for college students, innovation and entrepreneurship competitions for college students have sprung up like mushrooms after rain. The enthusiasm of the organizers to organize the competitions and the enthusiasm of college students to participate in the competitions have unprecedentedly increased, and the innovation and entrepreneurship competitions have shown an unprecedented prosperity. However, after the competition, many innovative and entrepreneurial achievements are shelved, with relatively few channels for connecting them with social resources, insufficient transformation of achievements, and low efficiency.

The key to the above problems is the disconnection between the innovation chain, education chain, and industrial chain. How to make the cultivation of innovative and entrepreneurial talents in universities effective, establish an effective mechanism for cultivating innovative and entrepreneurial talents, and effectively connect the innovation chain with the industrial chain is an urgent research and practical issue for educators.

The cultivation of innovative talents embodies the concept of integrating science, education, industry and education. Currently, the innovation paradigm is accelerating its evolution towards a converged research paradigm, industry demand, and technological iteration, forcing the reshaping of teaching and research organizational forms based on "subject profession" and knowledge "transmission acquisition" as the main teaching method. Drawing on the construction experience of innovation and entrepreneurship laboratories in domestic and foreign universities, promoting the dual integration of science, education, industry, and education in the cultivation of innovative talents in innovation and entrepreneurship laboratories can solve the problems of weak teaching staff, small coverage, lack of interdisciplinary intersection, form exceeding content, and insufficient achievement transformation in talent cultivation. In the new era characterized by numbers, we will deeply analyze the theoretical and practical logic of cultivating top-notch innovative talents in innovation and entrepreneurship laboratories, explore the mechanism, model, and path of cultivating innovative talents in civil aviation, and create a "science education industry education" dual integration innovation talent training platform based on innovation and entrepreneurship laboratories. Project research is not only beneficial for cultivating students' DNA for innovation, entrepreneurship, and creation, but also provides a new paradigm and plan for cultivating top-notch innovative talents for the development of higher education in China.

2. The Reform Goals And Construction Content Of Civil Aviation Talent Cultivation

2.1. Reform Objectives

Exploring the mechanism for cultivating innovative and entrepreneurial talents in civil aviation, constructing a project-based (PBL) innovation and entrepreneurship teaching model, and creating an innovation and entrepreneurship experimental platform for the dual integration of science, education, industry, and education in civil aviation, with the aim of proposing a new paradigm and plan for cultivating top-notch innovative talents through the dual integration of science, education, industry, and education in the future innovation and entrepreneurship laboratory.

2.2. Content Of Talent Training Reform

Clarify the connotation, difficulties, and key elements of innovation and entrepreneurship education reform, construct a scientific and effective mechanism for cultivating innovation and entrepreneurship talents, stimulate students' creativity through knowledge transmission and atmosphere creation, comprehensively apply learned professional knowledge to form "works", transform works into "products" guided by market demand, turn products into "commodities" through corporate operation, and accurately connect the innovation chain, education chain, and industrial chain, Forming a chain of innovation and entrepreneurship processes based on talent cultivation - a mechanism for cultivating innovative and entrepreneurial talents in civil aviation. Taking the training mode and practice of innovative and entrepreneurial talents as the research object, we will deeply explore the coupling point between "double innovation" education and PBL teaching mode, construct a new project-based (PBL) double innovation talent training model, explore new teaching methods that force knowledge "transmission acquisition"

transformation due to industry demand and technological iteration, and reshape the teaching and research organizational form based on "subject profession".

Drawing on the construction experience of innovation and entrepreneurship laboratories in domestic and foreign universities, we will promote the dual integration of science, education, industry, and education in the cultivation of innovative talents in innovation and entrepreneurship laboratories, and solve problems such as limited coverage, lack of interdisciplinary integration, form exceeding content, and convergence of training concepts and ideas in talent cultivation. Deeply analyze the theoretical and practical logic of cultivating innovative talents in innovation and entrepreneurship laboratories, cultivate the "DNA" of students in innovation, entrepreneurship, and creation, and research and propose a new paradigm and plan for cultivating innovative talents through the integration of science, education, industry, and education in future innovation and entrepreneurship laboratories.

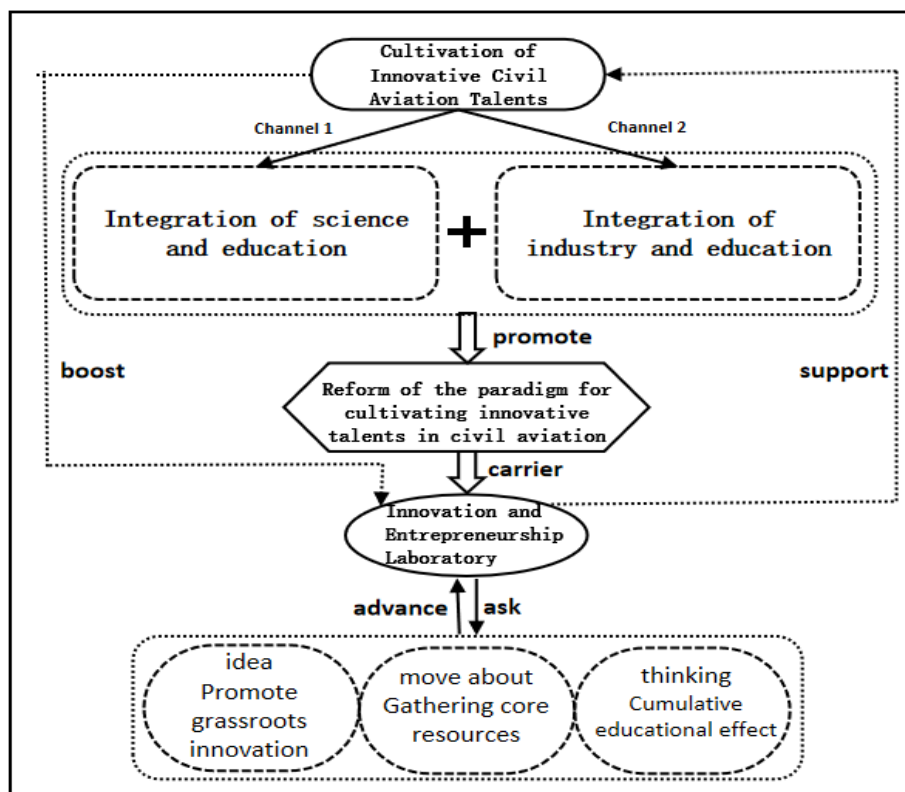


Figure 1. The Paradigm Framework for Cultivating Top Innovative Talents in the Innovation and Entrepreneurship Laboratory

The paradigm of cultivating top-notch innovative talents in the Innovation and Entrepreneurship Laboratory is highly independent in concept, promoting innovation at the bottom level, fully opening up and gathering core resources for cultivating top-notch innovative talents in action, and accommodating the cumulative effect of failure in thinking on cultivating top-notch innovative talents (Figure 1).

3. Talent Training Mechanisms, Models, And Paths Under The Background Of Innovation And Entrepreneurship

The article focuses on the new model and paradigm transformation of innovative and entrepreneurial talent cultivation, explores the mechanism of cultivating innovative and entrepreneurial talents in civil aviation, constructs a project-based (PBL) double innovation

teaching model, and creates an innovative and entrepreneurial experimental platform for the dual integration of science, education, industry, and education in civil aviation.

3.1. Building A Mechanism For Cultivating Innovative And Entrepreneurial Talents in Civil Aviation

Most innovation and entrepreneurship education in universities focuses on the innovation chain and lacks effective integration with the industrial chain. To make innovation and entrepreneurship education effective, it is necessary to connect the innovation chain and the industrial chain, and through the education chain of talent cultivation, industrialize the achievements of innovation and implement precise docking. In this process, the key is to stimulate students' innovation needs, the core is to apply professional knowledge, the key is to market-oriented innovation results, and the guarantee is a market-oriented operating mechanism. Therefore, based on the education chain of talent cultivation, students can be stimulated to be "creative" through knowledge transmission and atmosphere creation, and their learned professional knowledge can be comprehensively applied to form "works". With market demand as the guide, works can be transformed into "products", and products can be turned into "commercial products" through corporate operation, forming a precise connection between the innovation and entrepreneurship chains based on the education chain of cultivating innovative and entrepreneurial talents, And thus establish an effective mechanism for cultivating innovative and entrepreneurial talents in universities.

"Creativity": By teaching subject and professional courses, offering innovation and entrepreneurship courses, organizing various subject competitions, and strengthening the training of students' "double innovation" skills and methods, a good innovation and entrepreneurship atmosphere is formed on campus, and students' "double innovation" awareness is improved. Encourage college students to be market-oriented, conduct in-depth social research, and seek creative inspiration from their daily lives, factories, and fields. Combine inspiration with learned knowledge, under the guidance of teachers, select creative projects, and cultivate students' innovation ability and literacy.

"Works": Innovation and entrepreneurship teams organized by on campus and off campus mentors formed by creative proposers, transforming creativity into tangible objects. Leveraging the advantageous resources of on campus laboratories, engineering training centers, and off campus enterprises, works are created to cultivate students' hands-on and design abilities.

"Product": Through participating in various subject competitions, the "Challenge Cup" technology production competition, and the "Challenge Cup" entrepreneurship plan competition, combined with the suggestions of experts and judges, the entrepreneurial team optimizes the design of the work's functions in the off campus innovation and entrepreneurship base, produces products with practical functions, and cultivates students' engineering implementation and analysis abilities.

"Commodity": Through the PK of the "Internet plus" innovation and entrepreneurship contest, for products with market potential, a company co created by instructors and students can be established, patent application and product defect detection can be organized, and the products can be pushed into the market to create commodities that meet social needs and achieve better economic benefits. Through a two-layer equity incentive mechanism, benefits are fed back to the early stage of research and development design, cultivating students' decision-making ability, resource integration ability, and management ability.

Through the above four stages, an effective mechanism for cultivating innovative and entrepreneurial talents in the "One Innovation, Three Quality" initiative is established to

stimulate students' creativity, apply professional knowledge to form "works", transform works into "products" guided by the market, and transform products into "commodities" through corporate operations, so as to organically connect the innovation chain, education chain, and industrial chain.

3.2. Introducing Project-based Learning (PBL) And Innovating The Talent Cultivation Model For Entrepreneurship And Entrepreneurship

PBL (Project Based Learning) project-based teaching is a problem oriented teaching method that is a real-world student-centered educational approach that designs learning scenarios. PBL teaching takes the problems or unmet needs discovered during learning as the starting point, guiding students to integrate and utilize various resources to solve problems. For example, asking students to explore how to optimize the energy consumption of houses, students need to conduct thorough research during the project completion process, and achieve a combination of theoretical knowledge and practical situations.

By applying the PBL teaching model to the innovation and entrepreneurship education of college students in our university, we aim to construct a scientific and efficient teaching system for college student innovation and entrepreneurship. Teachers should play a leading role in teaching applications, mainly by creating problems related to innovation and entrepreneurship before class, and guiding students to form teams during class to explore and solve problems. In the preparation stage of teaching, students need to understand the PBL teaching model and determine the issues to participate in discussions. Teachers need to clarify course objectives and develop evaluation systems, while grouping students based on their knowledge and ability characteristics. In the teaching exploration stage, the teacher asks questions to immerse students in the context of innovation and entrepreneurship problems, division of labor and cooperation, information sharing, information processing, and determining solutions. During this process, teachers provide guidance, supervision, timely evaluation, and mobilize the enthusiasm of student teams to guide them in solving problems. Then the student team conducts a project roadshow presentation, and the teacher and other students carefully listen to the report. Finally, in the evaluation and summary stage, students are asked to conduct self-evaluation and group evaluation. Teachers provide evaluation and extension, while students improve and perfect their plans to achieve knowledge transfer.

3.3. Exploring New Paradigms And Paths For Cultivating Entrepreneurial And Entrepreneurial Talents Based On Innovation And Entrepreneurship Laboratories

Actively explore the construction and operation mechanism of innovation and entrepreneurship laboratories. The innovation and entrepreneurship laboratory's dual integration of science, education, industry, and education to cultivate top-notch innovative talents needs to be fully open in action, and multiple entities should collaborate to gather the advantageous resources for cultivating top-notch innovative talents, enhancing students' ability to integrate across boundaries and solve complex problems.

3.3.1. Deeply Tap Into Internal Resources Of Universities

Using the Innovation and Entrepreneurship Laboratory as a carrier and STEAM education philosophy, connecting campus education and scientific research talent cultivation resources, driving professional teaching and research laboratories, teacher-student co construction of scientific and technological innovation organizations, maker spaces, and science parks to form a "big laboratory" top-notch innovative talent cultivation pattern. Top notch innovative talent cultivation pattern in the laboratory. Change the current situation of "emphasizing scientific research and neglecting teaching" within universities, form a cross disciplinary and professional teaching chain for students, and achieve the unity of "the educational nature of

scientific research and the scientific research nature of teaching". Specifically, relying on innovation and entrepreneurship laboratories, we aim to gather "teacher+", "curriculum+", "project+", and "practice+" resources for cultivating top-notch innovative talents. Through the "big laboratory", we will guide teachers to conduct scientific research on new perspectives, methods, and ideas to students; Through student participation in project practice, cultivate their ability to actively explore, research, and hands-on skills.

3.3.2. Deeply Explore The Core Educational Resources Of Off Campus Industry Education Integration

Universities should have a "cross-border" pattern, fully gather government, enterprises, research institutes, and social core educational resources through innovation and entrepreneurship laboratories, shorten the distance between talent cultivation on campus, industrial practice, and scientific frontiers, establish a new ecosystem for cultivating top-notch innovative talents, and achieve synergistic resonance between industrial demand and student exploration.

4. Talent Cultivation Effectiveness

The above construction plan has achieved significant results and achieved rich results. Actively carrying out school government cooperation and school enterprise cooperation, and establishing close cooperative relationships with the government and enterprises. Actively developing off campus training bases, providing students with a large number of on-the-job internship positions, effectively ensuring the employment rate and professional alignment rate of this major. The teaching team has obtained multiple teaching research projects and achievements, guided students to participate in extracurricular practical activities at various levels, and won multiple national, provincial, and school level awards and honors.

Through the cultivation of practical innovation, students' basic hands-on and innovative abilities have been significantly improved. Many students have also started their own businesses, applied for patents, and took postgraduate entrance exams to continue their studies. As students participate in competitions more frequently, their award rates become higher, and their innovative abilities become stronger.

The practical teaching platform provides a venue for communication, discussion, research and development, and demonstration of innovative activities for students, as well as necessary tools and equipment, making it possible for creativity that students could only imagine in the past to be realized. In the past two years, students have won more than 10 innovation and entrepreneurship training programs, including 3 national awards.

5. Conclusion

The article constructs a project-based (PBL) innovation and entrepreneurship teaching model, creating an innovation and entrepreneurship experimental platform for the dual integration of science, education, industry, and education in civil aviation. It proposes a new paradigm and plan for the cultivation of top-notch innovative talents through the dual integration of science, education, industry, and education in the future innovation and entrepreneurship laboratory, providing high-quality civil aviation professionals for the development of civil aviation enterprises and institutions, and improving the service level of the civil aviation industry, Enhance the core competitiveness of industry development.

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2. 2023 School level Innovation and Entrepreneurship Demonstration Course: Transportation System Analysis and Intelligent Algorithms
3. Research and Practice Project on Education and Teaching Reform of Zhengzhou Institute of Aeronautics and Astronautics in 2023 (zhjysc23-01): Research on the Training Mechanism, Model, and Path of Top Innovative Talents in Civil Aviation for "One Innovation and Three Quality"
4. The second batch of undergraduate virtual simulation experiment teaching projects in Henan Province: Virtual simulation project for low-carbon and energy-saving operation decision-making of aviation enterprises
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. Research topic of the Henan Provincial Federation of Social Sciences for 2023 (SKL-2023-1167): Research on Innovation and Entrepreneurship Issues from the Perspective of Science and Education Integration
7. 2023 Zhengzhou Social Science Research Project (ZSLX2023+1531): Research on the Training Mechanism, Model, and Path of Top Innovative Talents under the Background of "Double Innovation"
8. Open Fund Support from Henan Provincial Key Laboratory of General Aviation Technology (Project Number: ZHKF-230209): Research on Key Technologies for Collaborative Intelligent Decision Making in Data Driven Aviation Operations

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