

# Study on the Mining and Teaching Practice of Ideological and Political Elements in Civil Aviation Courses based on the History of Civil Aviation Development

## -- Taking "Introduction to Civil Aviation" as an Example

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### Abstract

To implement the requirements of ideological and political education in courses and solve the problem of the disconnect between ideological and political education and professional knowledge in civil aviation professional courses, this paper takes "Introduction to Civil Aviation" as the research vehicle and conducts a systematic study on the mining and teaching practice of ideological and political elements in courses from the perspective of the history of civil aviation development. Through literature review, case analysis, interviews, and action research, four principles for mining ideological and political elements are clarified. Core elements are sorted out from five dimensions, including national sentiment and scientific spirit, and the integration points with the course are identified. A three-dimensional teaching practice path of "goal reconstruction - content optimization - evaluation improvement" is constructed, and the implementation effect is verified by combining teaching cases. The study shows that the curriculum ideological and political integration model based on the history of civil aviation development can effectively improve the educational effectiveness of "Introduction to Civil Aviation" teaching and provide practical reference for the construction of ideological and political education in civil aviation professional courses. However, it also has shortcomings such as limited practical samples and an imperfect evaluation system. Further research is needed to expand the scope of research and optimize resource reserves.

### Keywords

History of Civil Aviation Development; Ideological and Political Education in Curriculum; "Introduction to Civil Aviation"; Element Exploration; Teaching Practice.

## 1. Introduction

In recent years, the state has successively introduced a number of policies to promote the integration of ideological and political education into the entire process of professional talent training, emphasizing that all types of courses should move in the same direction as ideological and political courses, and construct a comprehensive, all-round education system. As a national strategic emerging industry, the civil aviation industry shoulders the important mission of ensuring the smooth operation of national transportation hubs and serving economic and social development, and its demand for compound talents with both professional and ideological and political literacy is increasingly urgent. "Introduction to Civil Aviation," as a core introductory course for civil aviation-related majors, covers core content such as the history of civil aviation development, technological foundations, and operational management. Its course attributes determine its inherent potential for ideological and political education, making it an important

vehicle for carrying out ideological and political education in curriculum [1]. From a theoretical perspective, this study can enrich the research system of ideological and political education in civil aviation professional courses, expand the educational value boundaries of the history of civil aviation development, and provide theoretical reference for the construction of ideological and political education in similar professional courses [2]. From a practical perspective, it can address the problems of insufficient integration of ideological and political elements and monotonous methods in the teaching of "Introduction to Civil Aviation", provide support for curriculum teaching reform, and help cultivate high-quality talents who meet the development needs of the civil aviation industry.

A review of domestic and international research reveals that while domestic research on the integration of ideological and political education into professional courses has established a general approach, specific studies focusing on the civil aviation field remain fragmented, often emphasizing the integration of ideological and political education into individual teaching segments, lacking a systematic exploration of the core carrier of civil aviation development history [3]. International research concentrates on the construction of educational models for aviation-related professional courses. Although there is no directly corresponding concept of ideological and political education in courses, their experience in integrating professional education with value guidance has indirect reference value [4]. Existing research has not yet formed a complete system of "excavation of development history elements - deep integration into courses - implementation in teaching practice," and its focus on the "Introduction to Civil Aviation" course is insufficient, providing a clear entry point for this research.

The core content of this study includes the excavation and classification of ideological and political elements in the history of civil aviation development, the identification of integration points with "Introduction to Civil Aviation," the design of teaching practice paths, and the verification of effectiveness [5]. It employs literature review to clarify the theoretical foundation, case analysis to focus on core chapters of the course, interviews to survey the needs of teachers and students, and action research to optimize the teaching plan. The research innovation lies in systematically excavating distinctive ideological and political elements in civil aviation from a historical perspective and constructing an integration model that fits the curriculum system. The challenge lies in balancing the professionalism and relevance of these elements, controlling the naturalness of integration, and constructing a scientific evaluation system [6]. By precisely addressing these challenges, this study can provide a practical solution for implementing ideological and political education in civil aviation professional courses, promoting the improvement of educational quality.

## **2. Excavation of Ideological and Political Elements in Courses based on the History of Civil Aviation Development**

### **2.1. Excavation Principles**

To ensure that the exploration of ideological and political elements aligns with research objectives and teaching practice, four core principles must be followed. The first principle is professionalism: closely adhering to the professional attributes of civil aviation, the explored ideological and political elements must be deeply integrated with the teaching content of "Introduction to Civil Aviation," avoiding empty talk about ideological and political education divorced from the profession, and achieving synergy between professional knowledge transmission and value guidance. The second principle is adaptability: based on the cognitive patterns and learning characteristics of university students, and combined with the introductory nature of the course, adopting easily understandable presentation methods to avoid rigid implantation and excessive preaching, thereby improving student acceptance. The third principle is timeliness: keeping pace with the development trends of the civil aviation

industry, combining the latest practices such as the iteration of domestically produced large aircraft and the green development of civil aviation, exploring elements with contemporary appeal to enhance the timeliness of ideological and political education [7]. The fourth principle is systematic: covering the entire history of civil aviation development, exploring from multiple dimensions such as technological breakthroughs, industry governance, and major events to form a complete element system, avoiding fragmented integration that weakens the educational effect. These four principles support each other and are organically unified, providing direction for the accurate exploration of ideological and political elements.

## **2.2. Exploration Dimensions and Core Elements**

This study systematically examines the core ideological and political elements in the history of civil aviation development from five dimensions, enriching the educational resource library. The first dimension focuses on the development of the civil aviation industry from scratch to its current strength, highlighting the national integrity demonstrated by the "Two Airlines Uprising," the national responsibility reflected in the development of domestically produced large aircraft, and the dedication of civil aviation personnel in the fight against the pandemic and emergency rescue-all core materials [8]. The second dimension revolves around the iteration of civil aviation technology, from early breakthroughs in navigation technology to modern aircraft upgrades, exploring the pioneering spirit of researchers in overcoming difficulties and pursuing excellence, and conveying the concept of innovation. The third dimension, based on the civil aviation principle of "safety first, service paramount," uses typical cases from air traffic control, maintenance, and cabin crew positions to strengthen the professional ethics of meticulousness and dedication. The fourth dimension, examining the establishment and improvement of the civil aviation industry's legal system, combines practices such as energy conservation and emission reduction by civil aviation enterprises and the opening of public welfare routes to convey legal awareness and social responsibility. The fifth dimension, focusing on the international development of civil aviation, showcases the achievements of China's civil aviation in route expansion, international cooperation, and participation in global civil aviation governance, cultivating students' international perspective.

## **2.3. Analysis of the Integration Points between Ideological and Political Education Elements and the "Introduction to Civil Aviation" Course**

By combining the core chapters and knowledge points of "Introduction to Civil Aviation," precise integration points are identified to achieve a deep integration of ideological and political education with professional content. The chapter "A Brief History of Civil Aviation Development" can incorporate elements such as the Two Airlines Uprising and the construction of a strong civil aviation nation, explaining the development trajectory while conveying patriotism; the chapter "Fundamentals of Civil Aviation Technology" incorporates elements such as the development of domestically produced large aircraft and navigation technology, connecting with the cultivation of scientific spirit; the chapter "Civil Aviation Operations Management" incorporates industry regulations and public welfare routes, permeating the awareness of legal responsibility; and the chapter "Civil Aviation Safety and Service" combines job-related cases to strengthen the cultivation of professional qualities [9]. At the knowledge point level, the development story of domestically produced large aircraft is incorporated when explaining aircraft types, lessons and perseverance in the history of civil aviation safety development are combined when explaining safety management, and international cooperation achievements are incorporated when explaining route layout, allowing ideological and political elements to naturally permeate with professional knowledge points, avoiding a rigid separation.

### 3. Design of the Ideological and Political Education Teaching Practice Path for "Introduction to Civil Aviation"

#### 3.1. Reconstruction of Teaching Objectives

The teaching objectives of "Introduction to Civil Aviation" are restructured around the three dimensions of knowledge, ability, and value, achieving an organic unity among the three and constructing a "three-in-one" teaching objective framework, as shown in Fig. 1 below:

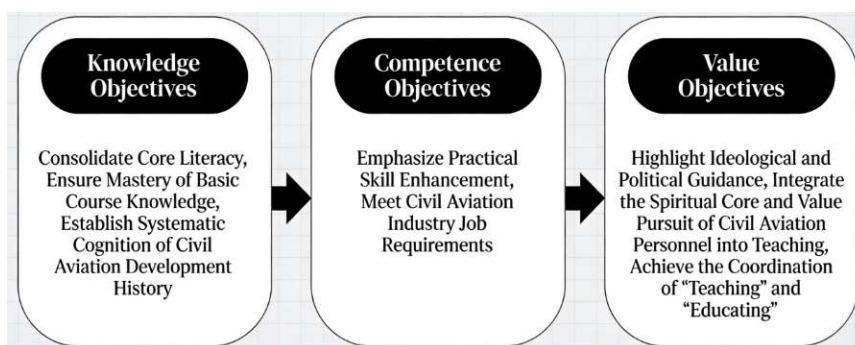


Fig.1 Reconstruction of Teaching Objectives

Among them, knowledge objectives, as the foundational dimension, focus on solidifying core competencies, requiring students not only to master the professional knowledge points stipulated in the course but also emphasizing a systematic understanding of the historical context of civil aviation development, providing a knowledge carrier for the integration of ideological and political elements; ability objectives, as the core dimension, emphasize the gradual improvement of practical skills, from professional knowledge to problem-solving, gradually adapting to the ability requirements of the civil aviation industry for multi-skilled talents; value objectives, as the guiding dimension, highlight the core role of ideological and political education, integrating the spiritual core, professional pursuit, and national responsibility of civil aviation personnel into the entire teaching process, achieving deep synergy between "teaching" and "imparting knowledge," and simultaneously advancing knowledge transmission, ability cultivation, and value guidance.

#### 3.2. Optimization of Teaching Content

Optimizing teaching content is key to effectively integrating ideological and political education into courses. It is necessary to base the curriculum on the chapter system of "Introduction to Civil Aviation", innovate the way of integrating ideological and political elements, scientifically arrange teaching content, and construct a teaching content system with a dual orientation of "knowledge + value" to ensure the integrity of professional knowledge while highlighting the guiding role of ideological and political education. Three integration methods are employed to achieve deep integration: Embedded integration naturally permeates ideological and political elements into the explanation of knowledge points, avoiding a rigid separation. For example, when explaining the iteration of civil aviation aircraft models, the arduous journey of domestically produced large aircraft from independent research and development to commercial operation is interspersed, combined with stories of researchers overcoming difficulties, conveying the spirit of innovation and the responsibility of a major power; Case-based integration adds special cases on ideological and political education, selecting typical events such as civil aviation emergency transportation support during the pandemic, the opening of public welfare routes for poverty alleviation, and the transportation of earthquake relief supplies, setting up classroom discussions and case analysis sessions to guide students to deeply reflect on the social responsibility and mission of the civil aviation industry and deepen

their value understanding; Extended integration extends extracurricular learning resources, recommending materials such as the documentary "China Civil Aviation Development History," interview videos with senior figures in the civil aviation industry, and industry development reports, guiding students to explore independently, broaden their cognitive boundaries, and achieve an organic connection between in-class teaching and extracurricular extension.

In terms of content arrangement, the proportion of ideological and political elements and professional content is rationally planned in conjunction with the course syllabus and class hour allocation. Each chapter reserves 10-15 minutes for ideological and political integration, ensuring both the teaching progress of core professional content and the effective implementation of ideological and political education. Following the chapter logic of "Development History - Technological Foundation - Operation Management - Safety Service," corresponding ideological and political elements are gradually integrated: the "Brief History of Civil Aviation Development" chapter emphasizes patriotism; the "Civil Aviation Technological Foundation" chapter focuses on instilling scientific spirit; the "Civil Aviation Operation Management" chapter strengthens awareness of legal responsibility; and the "Civil Aviation Safety and Service" chapter focuses on cultivating professional qualities, forming a clear and progressive educational framework. Simultaneously, the curriculum keeps abreast of the latest developments in the civil aviation industry, promptly supplementing it with the latest industry cases, such as the development progress of new domestically produced large aircraft models, the practice of green and low-carbon transformation in civil aviation, and the achievements in smart civil aviation construction, maintaining the timeliness and appeal of the teaching content and ensuring that ideological and political education resonates with industry development.

### **3.3. Improved Teaching Evaluation System**

A multi-dimensional evaluation system has been constructed, taking into account both process and results, knowledge and value, to comprehensively reflect teaching effectiveness.

#### **3.3.1. Evaluation Dimensions**

A three-dimensional evaluation system of "knowledge mastery + ability enhancement + value guidance" is established, with clear weights for each dimension to ensure comprehensiveness and relevance of the evaluation. The knowledge mastery dimension accounts for 40%, focusing on students' understanding of core professional knowledge points in "Introduction to Civil Aviation," key content in the history of civil aviation development, and industry regulations. Quantitative assessment is conducted through classroom questioning, assignment quality, and exam scores. The ability enhancement dimension accounts for 30%, focusing on the improvement of students' professional cognitive abilities, case analysis abilities, teamwork abilities, and problem-solving abilities. A comprehensive evaluation is conducted based on classroom performance, group presentations, and case analysis reports. The value guidance dimension accounts for 30%, serving as a core indicator for evaluating the effectiveness of ideological and political education. It focuses on the cultivation of students' national sentiment, professional ethics, scientific spirit, and sense of responsibility. Qualitative and quantitative assessments are conducted through classroom participation, practical performance, and answers to ideological and political essay questions, highlighting the importance of ideological and political evaluation.

#### **3.3.2. Evaluation Methods**

A combination of formative and summative assessments is adopted, with optimized weighting to achieve comprehensive evaluation of students' learning. Formative assessment accounts for 60% of the evaluation, covering four modules: classroom participation (15%), case study reports (20%), extracurricular practice (15%), and group presentations (10%). Classroom participation focuses on assessing students' understanding of the integration of ideological and political elements with professional knowledge and their active participation. Case study

reports focus on students' analytical abilities and value perception of ideological and political cases. Extracurricular practice is evaluated based on visits to the Civil Aviation Museum and participation in industry lectures. Group presentations emphasize students' teamwork and knowledge application abilities. Summative assessment accounts for 40%, centered on the final exam. The exam structure is optimized, adding essay questions related to ideological and political education in addition to professional knowledge questions. This guides students to analyze the intrinsic connection between ideological and political elements and professional learning through cases from the history of civil aviation development, assessing their value judgments and depth of understanding. Meanwhile, a multi-faceted evaluation mechanism was introduced, constructing a three-dimensional evaluation system of "teacher evaluation + student peer evaluation + industry mentor feedback." Teacher evaluation accounted for 60%, responsible for assessing overall teaching effectiveness and student performance; student peer evaluation accounted for 20%, enhancing objectivity through group and class-wide assessments; and industry mentor feedback accounted for 20%, focusing on students' professional qualities and sense of responsibility in accordance with the actual needs of civil aviation positions, making the evaluation more aligned with industry talent development standards and improving its scientific rigor and practicality.

## **4. Teaching Practice Cases and Effect Analysis**

### **4.1. Design and Implementation of Teaching Practice Cases**

This study selected 86 students from two classes of civil aviation transportation majors at a university in 2025 as the subjects of the practical application. The experimental class (120 students) used an optimized teaching plan, while the control class (60 students) used a traditional teaching plan. The practical application period was one semester (16 weeks, 4 class hours per week). The case studies focused on two main topics: "Patriotic Sentiments in the History of Civil Aviation Development" and "The Formation and Adherence of Civil Aviation Safety Culture," integrated with the chapters "A Brief History of Civil Aviation Development" and "Civil Aviation Safety and Service" in the textbook \*Introduction to Civil Aviation\*. During implementation, the "Patriotic Sentiments" topic incorporated cases of the Two Airlines Uprising and the development of domestically produced large aircraft, using case-based teaching to organize classroom discussions and guide students to analyze the connection between civil aviation development and the fate of the nation. The "Safety Culture" topic simulated air traffic control scenarios, incorporating typical events in the history of civil aviation safety development, using scenario-based teaching to allow students to participate in safety decision-making simulations and strengthen their professional qualities. Simultaneously, relevant documentary clips and industry cases were shared online, and offline activities included visits to the local civil aviation museum and lectures by senior figures from civil aviation enterprises, achieving a fusion of online and offline learning and extending the practical application. The entire teaching process, teacher-student interactions, and details of integrating ideological and political elements were recorded, allowing for timely adjustments to the teaching pace and methods.

### **4.2. Teaching Effectiveness Survey and Analysis**

#### **4.2.1. Survey Methods**

After the practice, an effectiveness survey was conducted using questionnaires and interviews. The questionnaire survey targeted 120 students from two classes, distributing 120 questionnaires and collecting 120 valid responses, achieving a 100% response rate. The questionnaire focused on dimensions such as acceptance of ideological and political education integration, knowledge mastery, and improvement in ideological and political literacy,

designing 20 questions and using a 5-point Likert scale (1-very dissatisfied, 5-very satisfied). Interviews were conducted with 2 students from the experimental class, 2 instructors, an Ideological and Political Theory teacher, and 2 mentors from the civil aviation industry. Semi-structured interviews were conducted focusing on the rationality of the teaching plan, the effectiveness of ideological and political education integration, and existing problems, collecting feedback.

**4.2.2. Results Analysis**

The survey data showed that the experimental class performed better than the control class in all dimensions, as shown in Table 1 below. As shown in the table, the experimental class scored highest in the dimension of ideological and political literacy improvement, exceeding the control class by 1.02 points. This indicates that the curriculum-based ideological and political education integration model based on the history of civil aviation development has a significant effect on guiding students' values. The experimental class also scored higher by 0.78 and 0.85 points in the dimensions of knowledge mastery and ability improvement, respectively, confirming that the integration of ideological and political education with professional knowledge can promote students' understanding and application of professional knowledge.

**Table 1. Scoring Results**

evaluation Dimensions	Average score of experimental class	average score of the control class	Score difference	Satisfaction rate of the experimental class (4-5 points)	Satisfaction rate of the control group (4-5 points)
Knowledge acquisition	4.23	3.45	0.78	86.05%	62.79%
Ability enhancement	4.18	3.33	0.85	83.72%	58.14%
Ideological and political literacy improvement	4.41	3.39	1.02	90.70%	56.98%
Overall teaching effectiveness	4.27	3.38	0.89	87.21%	60.47%

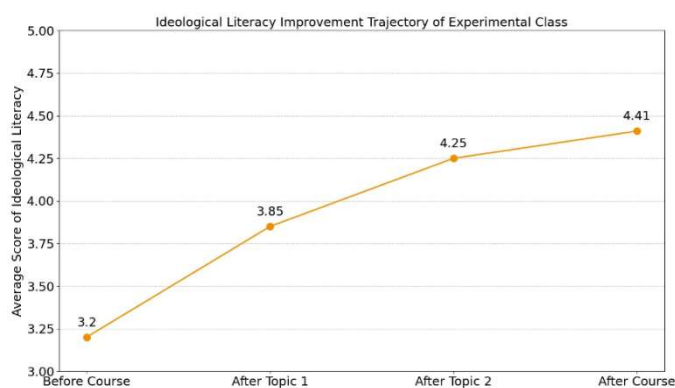


**Fig. 2 Trends in Scores Across Dimensions for the Experimental and Control Classes**

Fig. 2 shows the score trends of the experimental class and the control class across various dimensions. The horizontal axis represents the evaluation dimensions (corresponding to knowledge mastery, ability improvement, ideological and political literacy improvement, and overall teaching effectiveness, respectively, from 1 to 4), and the vertical axis represents the average score. As the figure shows, the experimental class achieved high scores across all

dimensions, with the most significant advantage in the ideological and political literacy improvement dimension. The control class had relatively balanced scores across all dimensions, but the overall score was lower. This indicates that the optimized teaching plan can comprehensively improve teaching effectiveness, especially in ideological and political education.

Fig. 3 shows the trajectory of improvement in the ideological and political literacy of students in the experimental class. The horizontal axis represents the teaching stages (1-4 correspond to before class, end of Topic 1, end of Topic 2, and after class, respectively), and the vertical axis represents the average score of ideological and political literacy. As shown in the figure, students' ideological and political literacy gradually improved as teaching progressed, with the most significant improvement after the completion of the thematic teaching. It remained at a high level after class, indicating that the integration of ideological and political elements has a sustained educational effect, consistent with students' cognitive patterns and the process of literacy formation.



**Fig. 3** Trajectory of Improvement in Ideological and Political Literacy of Experimental Class Students

Interview results showed that over 80% of the experimental class students believed that the integration of ideological and political elements enhanced their learning interest and deepened their understanding of the mission of the civil aviation industry; instructors stated that the integration was natural, did not affect the progress of professional teaching, and significantly improved student participation in class; industry mentors believed that the experimental class students' professional qualities and sense of responsibility were superior to those of the control class, and were more aligned with job requirements. However, the survey also found issues such as the less-than-smooth integration of ideological and political elements into some knowledge points and the potential for further improvement in the participation of industry mentors in the evaluation system.

### 4.3. Suggestions for Optimizing Teaching Practice

In response to the problems identified in practice, three optimization suggestions are proposed. Regarding the connection between teaching and learning, a "Handbook for Connecting Ideological and Political Elements with Professional Knowledge Points" will be compiled to clarify the timing and expression of each knowledge point, avoiding abrupt transitions. Teacher training will also be strengthened to improve teachers' ability to integrate ideological and political education. Regarding the evaluation system, the weight of industry mentor evaluations will be increased to 30%, evaluation indicators will be refined, and evaluation standards will be designed based on actual job requirements to improve the relevance of evaluations. Online evaluation tools will be introduced to simplify the evaluation process and improve efficiency. Regarding resource reserves, a resource database on the history of civil aviation development

and ideological and political education will be established, supplemented with the latest industry cases, interview videos of predecessors, and other materials, and the resource content will be updated regularly. Micro-lessons and virtual simulation resources adapted to the courses will be developed to enrich teaching methods and further enhance the appeal of ideological and political education.

## 5. Conclusion

This study systematically explored the elements of ideological and political education in the history of civil aviation development, clarifying that they encompass five core dimensions: national sentiment, scientific spirit, professional ethics, legal responsibility, and international perspective. These elements can be precisely linked to the knowledge points of each chapter of "Introduction to Civil Aviation," possessing significant educational value. By constructing a teaching practice path of "goal reconstruction - content optimization - evaluation improvement," and combining it with thematic case studies, the study verified that this model can effectively improve the teaching effect of "Introduction to Civil Aviation." It not only strengthens students' mastery of professional knowledge and enhances their abilities but also significantly cultivates their ideological and political literacy, addressing the disconnect between ideological and political education and professional studies. This study has certain limitations: the practical case studies only cover one major at one university, resulting in a limited sample size and coverage; the scientific validity and operability of the ideological and political education effectiveness evaluation system still need optimization, and the quantitative evaluation indicators need further refinement; the timeliness and richness of the ideological and political education resource database are insufficient, making it difficult to fully adapt to the rapidly developing needs of the industry. Further research can expand the scope of practice by conducting cross-institutional and cross-disciplinary comparative studies to enhance the universality of the findings; incorporate the latest developments in the civil aviation industry, adding distinctive ideological and political elements such as green and smart civil aviation; develop digital ideological and political resources and build an online resource-sharing platform; explore pathways for integrating ideological and political education into curriculum-based education and civil aviation professional qualification certification, embedding ideological and political literacy requirements into job entry standards to further enhance the effectiveness of education and deliver more versatile talents for the construction of a strong civil aviation nation.

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