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# Exploration of Professional Curriculum Reform in the Context of Engineering Education Accreditation

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**Abstract:** In this paper, issues related to the reform of the flight professional curriculum are explored in depth against the background of engineering education accreditation. By elaborating on the importance and necessity of flight professional curriculum reform, a series of practical reform initiatives are proposed. The results of the study show that, in the context of engineering education certification, the reform of flight professional curriculum should adopt strategies such as an industry-oriented curriculum, increasing practical activities in teaching links, promoting the integration of multidisciplinary contents, and improving the evaluation mechanism of the curriculum system, to improve the quality of education and cultivate high-quality flight talents.

**Keywords**: engineering education accreditation; professional curriculum; reform strategies

## Introduction

With the rapid development of the aviation industry and the intensification of global competition, the requirements for flight professionals are increasing. The implementation of engineering education accreditation has provided important guidance for quality assurance in higher education. However, there are still some problems in the reform of the flight professional curriculum. Therefore, it is of great significance to explore professional curriculum reform strategies in the context of engineering education accreditation to improve the quality of flight professional education and cultivate high-quality flight talents.

## 1. Overview of Engineering Education Accreditation

Engineering education accreditation is the process of evaluating and recognizing engineering degree programs in higher education institutions. It aims to ensure that engineering degree programs meet certain quality standards and cultivate qualified and competitive engineers. Accreditation of engineering education is usually carried out by relevant national or regional agencies or authoritative organizations. The accreditation process involves a comprehensive assessment of teaching programs, faculty, laboratory facilities, academic resources, student quality, and other aspects. The accreditation process usually requires schools to submit detailed documents and reports and conduct on-site audits and assessments. The evaluation team visits the school, interviews faculty, students, and administrators, and inspects laboratories and academic facilities. The main purposes of engineering education accreditation include: ensuring the quality of education, i.e., the accrediting body ensures that the school's engineering degree program meets international and industry standards and provides high-quality education and training through rigorous assessment (Kan, 2020); to enhance the competitiveness of graduates' employment, i.e., accreditation can provide students with better employment opportunities and career prospects; and to promote continual improvement, i.e., accreditation is a dynamic process in which schools need to continuously improve and adjust the education mode, curriculum, and other aspects to adapt to the changes

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and development of the engineering field.

## 2. Exploring the Significance of Professional Curriculum Reform in the Context of Engineering Education Accreditation

### 2.1. Adapt to the technological development of the aviation industry

With the continuous breakthroughs and innovations in aviation technology, profound changes have occurred in the design, manufacture, and operation of aircraft. The traditional teaching content and training mode can hardly meet the requirements of new technology for talent training. Therefore, through targeted curriculum reform, the latest technical knowledge and application practice can be incorporated into the teaching, so that students can understand and adapt to the development trend of new technology, and be prepared for future work in the aviation industry. Meanwhile, the aviation industry is highly competitive, and constantly improving one's technical level is the key to maintaining competitiveness. Through the reform of the flight professional curriculum, students can be provided with more advanced and practical educational content, to cultivate talents with the latest technological knowledge and operational capabilities, and provide aviation enterprises with a constant flow of innovative power, to keep them at the forefront of market competition. In addition, the development of the aviation industry involves the integration of many disciplinary fields, such as aeronautical engineering, material science, electronic technology, and so on. Reforming the flight professional curriculum, can promote the cross and integration between disciplines and cultivate talents with comprehensive quality (Lilan et al., 2020). These talents can cross disciplinary boundaries and collaborate to solve the complex problems faced by the aviation industry, thus promoting the rapid development of the whole industry.

### 2.2. Enhance the employment competitiveness of students

With the continuous development of the aviation industry, the demand for talent by aviation enterprises is getting higher and higher, and there is a strong need for talents with solid professional knowledge, rich practical experience, and good comprehensive quality. Through the reform of the flight professional curriculum, students' practical ability and teamwork spirit can be strengthened and their professionalism can be improved. The aviation industry pays attention to practical ability and teamwork, which requires flight personnel to have a high sense of responsibility and a rigorous working attitude. By increasing practical training sessions and carrying out teamwork projects, students' practical ability, problem-solving ability, and teamwork ability can be cultivated (Song & Zhang, 2019), so that they can have a greater competitive advantage in the job market. At the same time, the reform of the flight professional curriculum can strengthen the comprehensive quality education of students and improve their overall development level. Aviation enterprises need not only talents with professional skills but also need them to have strong communication skills, leadership, innovation cross-cultural communication skills, and so on. By deepening and expanding the content of the curriculum and focusing on cultivating students' soft skills and comprehensive quality, it can provide a better platform for their comprehensive development and make them more competitive in the job market. In addition, the reform of the flight professional curriculum is also conducive to improving students' industry adaptability and career development potential. The aviation industry is a constantly developing and changing industry, which requires practitioners to have strong learning abilities and adaptability. Through curriculum reform and the introduction of the latest technical knowledge and industry dynamics, students' sensitivity and insight into the industry can be cultivated, enabling them to keep abreast of the industry development trends and laying a solid foundation for their career development.

## 3. Explore the Reform Strategy for Professional Courses under the Background of Engineering

**Education Certification**

### 3.1. Industry-oriented curriculum

The implementation of the strategy of "industry-oriented curriculum" means that in the design and content arrangement of the curriculum, based on the industrial demand in the field of aviation, the trend of industrial development, technical requirements, and practical applications are incorporated into the curriculum, to cultivate talents in line with the requirements of the aviation industry. In terms of curriculum, industry-oriented reform needs to be carried out in response to the industrial demands in the aviation field. Teachers can conduct in-depth research and co-operation with enterprises industry associations, etc., to learn about the industry's development trends, technological innovations, and changes in demand (Sun & Qu, 2022). Then, combined with this information, the curriculum of flight majors will be comprehensively evaluated and adjusted to increase the content of courses that are closely related to the development of the industry, such as emerging aviation technology, aviation safety management, aviation operation management, etc., to make the students closer to the actual work demand and improve their professional competitiveness. In terms of teaching methods, industry-oriented reform needs to focus on the combination of practical teaching and industrial internship. Teachers can provide students with more practical opportunities by organizing experimental courses, simulation training, field trips, and other forms. For example, designing flight mission training programs and conducting aviation equipment operation drills enable students to improve their skills and resilience through practical operation and simulation exercises. At the same time, it can cooperate with aviation enterprises to carry out industrial internship projects, so that students can have the opportunity to personally participate in actual aviation work and understand the operation and requirements of the industry, thus cultivating students' practical ability and innovation consciousness and improving their professionalism and adaptability.

### 3.2. Increase practical activities in teaching sessions

The aim of "increasing practical activities in the teaching process" is to improve the practical application level of students, so that they can be better adapted to the work requirements in the aviation field. In the teaching process, teachers organize various forms of practical activities to enable students to have hands-on, real-life operations and practical training (Jiang et al., 2022). For example, in the flight manipulation technology course, flight simulator experiments can be arranged so that students can conduct flight training through the simulator to enhance their flight technology and safety awareness; in the aviation maintenance technology course, students can be organized to visit the maintenance base of the airline on the ground to understand the actual operation process of aviation maintenance and cultivate their practical operation ability. When formulating the professional course plan, teachers need to arrange the practical teaching links reasonably according to the target training requirements, industry demand, course nature, and students' learning progress (Fang et al., 2022). For example, in the aircraft design course, students can be arranged to carry out the design and production of small aircraft models to learn the structure and performance of aircraft through practical operation; in the aviation materials and processing technology course, students can be organized to carry out experiments on the processing of aviation parts, so that they can personally participate in the process of material processing and understand the impact of material properties on processing. Through such course design, it can improve students' practical ability and problem-solving ability, and cultivate their innovative thinking and practical skills. Of course, teachers need to have the rich practical experience and professional knowledge, be able to arrange practical activities reasonably according to the actual situation of students and the characteristics of the discipline, and give students the necessary guidance and counseling. For example, in flight simulator experiments, teachers can guide students to

make flight plans, analyze flight data, and help them master flight techniques and flight specifications. In maintenance base visits, teachers can lead students to understand the working principles and maintenance processes of different types of aircraft and guide them to observe and think. Through teachers' guidance and direction, students can better understand the purpose and significance of practical activities and improve their practical ability and learning effect.

### 3.3. Promote the integration of multidisciplinary contents

In the context of engineering education accreditation, promoting the integration of multidisciplinary content is one of the most important initiatives in the reform of the flight professional program. This can enable students to better solve complex aeronautical engineering problems by cultivating their interdisciplinary thinking ability and comprehensive application ability. The traditional flight professional curriculum often focuses only on cultivating students' professional knowledge and skills and lacks the integration and application of other disciplines. However, in actual aeronautical engineering, knowledge from multiple subject areas is involved, such as aeronautical mechanics, materials science, electronic engineering, etc. Therefore, in curriculum design, teachers should organically combine the contents of different disciplines to form a comprehensive curriculum system (Wang & Sun, 2020). For example, in the aircraft design course, the knowledge of aeronautical mechanics, structural mechanics, fluid mechanics, and other disciplines can be integrated into the course, so that students can understand the roles and interrelationships of different disciplines in aircraft design. Through such a course design, students' understanding and application of multidisciplinary content can be strengthened and their comprehensive quality can be cultivated. Of course, in promoting the integration of multidisciplinary content, teachers also need to pay attention to the development of students' abilities. This can be achieved through interdisciplinary project practice, teamwork, and comprehensive assessment. For example, students can be organized to participate in interdisciplinary project research, so that they can play different roles in the team and use their respective professional knowledge and skills to solve complex aeronautical engineering problems, to improve their interdisciplinary thinking ability and comprehensive application ability, and cultivate them to have the ability to solve practical problems.

### 3.4. Improve the evaluation mechanism of the curriculum system

"Improving the evaluation mechanism of the curriculum system" is one of the strategies for reforming the flight professional curriculum in the context of engineering education certification. Through an effective evaluation mechanism, the quality and effect of the curriculum can be assessed comprehensively and objectively, providing powerful support for further improving the teaching level and optimizing the curriculum design. First of all, improving the evaluation mechanism of the curriculum system needs to clarify the evaluation content. The evaluation content should include the achievement of course objectives, the appropriateness of teaching content and methods, and the effect of students' ability cultivation. By clarifying the evaluation content, teachers can comprehensively understand the quality and effect of the course and provide a basis for improving and optimizing the course. Secondly, improving the evaluation mechanism of the curriculum system requires choosing appropriate evaluation methods. Evaluation methods should make comprehensive use of qualitative and quantitative methods, including questionnaire surveys, assessment of students' work, teaching observation, and tracking of graduates' employment. Specifically, questionnaires can be used to collect students' feedback on the course to understand their evaluation of the course content, teaching methods, and learning outcomes; students' assignments and project reports can be evaluated to test the effect of their competence cultivation; teaching observation can be carried out to understand the teaching level and teaching effectiveness of

teachers; and graduates' employment can be tracked to assess the impact of the course on their employment competitiveness of the program. By choosing appropriate evaluation methods, the quality and effect of the courses can be assessed objectively and accurately to provide a reference for further improving and upgrading the teaching quality of the courses (Li et al., 2023). Finally, improving the evaluation mechanism of the curriculum system needs to focus on the evaluation effect. The results of the evaluation should be fed back to the relevant teachers and management departments promptly, and a comprehensive analysis and summary should be carried out to form a perfect evaluation report. The evaluation report should make clear the problems and deficiencies of the course and put forward corresponding improvement measures and suggestions. At the same time, the evaluation results should also be used as a basis for continuous improvement, guiding teachers to improve the quality of teaching and optimize course design. In addition, the evaluation results can also provide a reference for students to choose courses, helping them to better understand the content and effectiveness of the courses and make informed decisions on course selection. By focusing on the evaluation results, the in-depth reform of the curriculum can be promoted, and the teaching quality and influence of the flight professional courses can be continuously improved.

## Summary

In summary, in the context of engineering education accreditation, the reform of the flight professional curriculum is imperative. This paper puts forward the reform strategies from four aspects, namely, industry-oriented curriculum, increasing practical activities in teaching links, promoting the integration of multidisciplinary content, and improving the evaluation mechanism of the curriculum system, which can better meet the development needs of the aviation industry while improving the comprehensive quality of students. Of course, to ensure the smooth implementation of these reform strategies, it is also necessary to actively cooperate with the aviation industry enterprises, jointly promote the development of the entire industry, and contribute to the prosperity of the aviation industry.

## Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

## References

Kan, H. (2020). Exploration of practice teaching reform under the background of engineering education professional accreditation. *Chinese and Foreign Entrepreneurs, 2020*(08), 208.

Lilan, H., Pan, N., & Qian, J. (2020). Reform of teaching mode of civil aviation flight skills courses. *Science and Education Guide (Upper Ten), 2020*(22), 107–108.

Song, X., & Zhang, S. (2019). Exploration of the reform of aeronautical chart teaching in flight technology. *Science and Technology Wind, 2019*(13), 31.

Sun, N., & Qu, H. (2022). Object-oriented programming course reform and practice in the context of professional certification of engineering education. *University Education, 2022*(06), 56–59.

Jiang, Y., Liu, H., & Liu, J. (2022). Reform and construction of professional core curriculum under the background of engineering education accreditation. *China University Teaching, 2022*(12), 37–40.

Fang, J., Li, X., & Li, C, et al. (2022). Exploration of professional curriculum reform in the context of engineering education accreditation. *Technology and Innovation, 2022*(16).

Wang, R., & Sun, G. (2020). Exploring the reform of software engineering program under the background of engineering education certification. *Technology and Innovation, 2021*(14), 145–146.

Li, L., Jia, D., & Wang, G. (2023). On the exploration of curriculum system reform in the context of professional certification of engineering education--Take guilin aerospace institute of

technology's aircraft power engineering as an example. *Modern Vocational Education, 2023*(21), 109–112.

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