

# *Exploration and Practice of the Construction Path of the Integration of Ideological and Political Education with Engineering Courses under the Background of New Engineering*

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**Abstract:** “Curriculum-based ideological and political education” is a new approach to ideological and political work and course education in the new era. This paper proposed implementing the fundamental task of moral education, which is progressively implemented in the overall objective of talent cultivation. This includes integrating educational objectives into the design of teaching, incorporating all aspects of materials and methodology, as well as including every level of assessment. Through innovative teaching methods that integrate ideological and professional education reform, the approach aims to continuously improve the quality of professional education and increase the attractiveness of curriculum-based ideological and political education in universities. Practical application has shown that teachers must continually improve their understanding, flexibly utilize various online teaching platforms, and work together to build an ideological and political education “grand team”. This will allow the seamless integration of ideological elements into the curriculum in a subtle and stimulating way, making the curriculum-based ideological and political education approach more interesting and fulfilling.

## **1. Introduction**

In the current world, a new round of technological revolution and industrial transformation, represented by information technology, is accelerating. This has prompted continuous innovation in engineering education reform [1]. In order to adapt to socio-economic development and scientific progress, and to meet the needs for national strategy and the development of emerging industries, the Ministry of Education has organized several comprehensive universities to carry out seminars on the construction of new engineering disciplines. The “Fudan Consensus”, “Tianjin University Action”, and “Beijing Guidelines” have jointly proposed the overall development ideas of the new engineering discipline construction, marking a new stage in China’s engineering education reform. The construction of new engineering disciplines includes professional construction, platform construction, talent cultivation mode construction, management, and quality evaluation system construction,

among which the key content of talent cultivation mode construction is the construction, adjustment, and optimization of the curriculum system [2,3]. Curriculum-based ideological and political education is a new approach to ideological and political work and course education in the new era, which emphasizes the innovation of the teaching method of ideological and political courses, and aims to improve the teaching quality of ideological and political courses, and enhance their appeal in universities. Therefore, under the background of new engineering disciplines, it is necessary to carry out curriculum-based ideological and political education [4].

The curriculum-based ideological and political education in universities is a systematic project that faces practical difficulties in the implementation process. Compared to liberal arts majors, science and engineering majors have single teaching methods, awkward introduction of ideological and political cases, and insufficient educational evaluation effectiveness in the process of incorporating curriculum-political and ideological education. Therefore, this article started from the teaching reality of science and engineering majors, combined with the new trend of educational development under the background of new engineering disciplines, to integrate professional knowledge education into ideological and political education content, blending “explicit education” and “implicit education” into the teaching mode and assessment system. This will better play the role of classroom teaching in cultivating students, and provide new ideas for science and engineering majors to integrate ideological and political courses and majors in the same direction and resonance frequency [5,6].

## **2. The Necessity of Curriculum-Based Ideological and Political Education in Professional Course Development**

With the emergence of the new engineering education paradigm, there has been a pressing need to refine the current model for nurturing engineering talent. Beyond the mere cultivation of technical skills, the emphasis has been shifted towards the development of high-quality, comprehensive individuals who possess a robust sense of responsibility, innovation, and professionalism, all aligned towards serving the betterment of society [7]. The connotation-oriented development stage in Chinese higher education has witnessed the fusion of ideological and political education elements into engineering courses. This integration of ideological and political education with engineering disciplines serves as a vital channel for promoting seamless integration between the two areas, thereby facilitating the “curriculum-based ideological and political education” educational model and boosting the quality of talent cultivation in higher education, which is a prime trend in the connotation-oriented development of higher education.

## **3. Concrete Measures**

To concretely fulfill the fundamental task of nurturing individuals with ethics and morality and constructing a “Triple Full-Coverage” educational system that integrates ideological and political education throughout the curriculum, it is essential to address the issues of unclear decomposition of ideological and political education objectives, incomplete system coverage, and vague implementation links. To achieve this, the fundamental task of nurturing individuals with ethics and morality should be progressively implemented in the overall objectives of cultivating professional professionals, the teaching objectives of professional courses, and the educational objectives of individual courses. This integration should permeate the teaching design, materials, and methods, as well as all aspects of assessment. Furthermore, taking into account the different characteristics of each professional course, a comprehensive and distinctive ideological and political education environment should be created that “emphasizes the importance of every individual in the process of nurturing individuals with ethics and morality and ensures that comprehensiveness, diversity, and innovation are integrated into every course” [8].

### 3.1. Collaborative Exploration of Ideological and Political Education Objectives through Supply-Demand Coordination

The objectives of ideological and political education and professional education are not two parallel lines, but rather concentric circles that are closely intertwined and mutually responsive. Therefore, teachers can conduct industry and enterprise research to redefine the education objectives from the perspective of professional supply, based on the clarification of job competency requirements from the perspective of enterprise demand, as shown in Table 1 below:

Table 1: Exploring ideological and political education objectives through supply-demand coordination.

Demand-side objectives	Supply-side objectives	Ideological and political education objectives
Cultivate integrated and highly skilled professionals with a sense of responsibility, accountability, and teamwork capability	Train students in professional-related abilities, such as project management knowledge and the ability to operate and maintain telecommunications networks.	Foster students' sense of responsibility, accountability, and professionalism; develop their teamwork and collaboration skills.
Understand corporate culture and possess innovative spirit	In the field of information and communication engineering, students are trained to design system architectures that meet specific needs and verify their feasibility.	Enhance students' international perspective and legal awareness; cultivate students' innovative capability, creativity, and dedication to serving the overall situation.

### 3.2. Improving Ideological and Political Teaching Design and Integrating It into the Beautiful Chapter of Curriculum Education

In the process of curriculum teaching design, an approach that centers on teaching content as the “focus” and integrates ideological and political elements as the “thread” will effectively mobilize the educational resources embedded within various professional courses from the standpoint of ideological and political education. Guided by ideological and political courses, this approach will provide theoretical support and regulatory guidance for implementing ideological and political education in professional courses. In turn, professional courses will become a crucial foundation for supporting the implementation of ideological and political courses. The integration of ideological and political education into the curriculum and professional knowledge entails a fusion that aligns with both the school’s history and the specialty orientation. School history, alumni stories, characteristic cases, and industry-recognized successes can be explored to identify unique and distinctive ideological and political symbols to become a treasure of curriculum material and a pristine source of active learning, fully revealing the characteristics of the education being delivered. Teachers can further penetrate professional courses to discover a wealth of ideologically-driven knowledge. They can establish mechanisms such as mutual observation and collective lesson preparation to complement ideological and political teaching advantages and raise teaching resources collectively.

### 3.3. Applying Digital Thinking to Make Informed Decisions on Teaching Materials and Methods

In the teaching process, it is necessary to use digital technology to construct a virtual platform, create a realistic working environment, select rich ideological and political materials, innovate teaching methods and teaching formats, and enable students to experience the joy of learning their

profession in “experience-oriented” and “immersive-style” classrooms, thereby enhancing the quality of ideological and political education in professional courses. Therefore, it is necessary for professional course teachers to possess a digital mindset, accumulate digital ideological and political materials, enrich classroom teaching content, innovate teaching methods, and make full use of digital technology to empower ideological and political education. Second, professional course teachers need to always follow the core concept of “capturing hearts with content”, always attaching importance to prioritizing ideology and advocating “content is king”, and using digital thinking to innovate teaching methods and formats. However, they should avoid using digital thinking to override everything, leading to formalism, and should grasp the auxiliary needs of digital technology, and avoid confusing teaching priorities. This is the key to improving the quality of professional course teaching. Third, teachers innovate their teaching philosophy through the incorporate of new media technology, implement ideological and political education in a forms that is highly accepted by students, such as using advanced teaching tools such as “Treernity” and “China MOOC” to enrich dialogue and communication between teachers and students, building an ideological and political education system with a wider range of influence, and cleverly blending the “explicit layer” of professional course knowledge with the “implicit layer” of ideological and political elements, To achieve a beautiful chapter in curriculum education.

### **3.4. Innovating Assessment and Evaluation to Draw a Vibrant Picture of Curriculum-Based Character Education**

Assessment and evaluation are effective means to evaluate the effectiveness of curriculum-based ideological and political education and play an important role in the education system. In the process of professional education, comprehensive evaluation can be carried out from five aspects: ideological identity, cultural identity, vocational competency identity, teamwork identity, and dedication spirit identity, which highlights the humanistic and diverse nature of evaluation and better mobilizes the enthusiasm of professional teachers in collaborative education. Firstly, optimizing the evaluation content requires breaking through the limitations of the traditional quantitative evaluation model mainly led by teachers and including the students' cognitive, emotional, and value preferences within the scope of evaluation. Practice-based evaluation can encourage self-evaluation and mutual evaluation among students. Secondly, attention should be paid to the consistency between objective and quantitative evaluation and subjective validity verification. The combination of result evaluation, process evaluation, and dynamic evaluation can achieve comprehensive evaluation. Finally, the implementation of evaluation work requires necessary supervision and guarantee. A corresponding monitoring and guarantee mechanism is essential. A comprehensive system of regulations and rules should be established, following the concept and goal of collaborative education. This includes corresponding implementation methods and the establishment of a comprehensive monitoring mechanism to ensure the effectiveness of the inspection.

## **4. Reflection on Implementation Effect**

In the implementation of educational reform, the use of digital learning platforms can provide invaluable data and feedback regarding student evaluation of curriculum-based ideological and political education. However, in order to better promote the development of such educational systems, it is necessary to reflect upon the following three aspects:

Firstly, “the educator must be educated first”. Teachers must constantly strive to improve their own cognitive and intellectual capacities, integrating traditional cultural and ideological elements into their educational philosophy, thus imbuing curriculum-based ideological and political education with greater profundity and warmth.

Secondly, it is important to leverage information technology to transform teaching methods. Teachers must creatively utilize online teaching platforms to dynamically integrate course content with national development and global change, infusing curriculum-based ideological and political education with a sense of excitement and vivacity.

Thirdly, effective collaboration across disciplines, professions, and platforms can significantly enhance the quality and efficiency of curriculum-based ideological and political education. By breaking down disciplinary barriers, gathering excellent teaching resources, and engaging in cross-disciplinary cooperation between academic, industry, and governmental sectors, a cohesive team can be established to effectively explore material that resonates with and engages students, continually updating curriculum-based ideological and political content, and transforming academic resources into educational assets, thereby enriching and enhancing curriculum-based ideological and political education.

## 5. Conclusion

The integration of curriculum-based ideological and political education into professional curriculum instruction not only equips students with professional knowledge, but also instills in them essential vocational competencies such as dedication, innovation, and teamwork, thereby achieving the organic unity of knowledge transmission, comprehensive skills development, and moral education. In this way, the fundamental mission of cultivating students' virtues is effectively realized, truly fulfilling the goal of "holistic" education [9].

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