

# Research on the Practical Path and Case Library Construction of Integrating the Spirit of Craftsmanship and The Sentiment of Serving the Country Through Technology into The Ideological and Political Education of the "Computer Network" Course

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**Abstract:** In response to the common problem in the teaching of the "Computer Network" course in application-oriented undergraduate colleges of emphasizing technology and neglecting value guidance, there are practical problems such as "two skins" of ideological and political elements, fragmented ideological and political elements, lack of exclusive teaching cases, absence of ideological and political education in practical links, and difficulty in quantifying educational evaluation. Based on the positioning of application-oriented undergraduate talent cultivation, with the spirit of craftsmanship and the sentiment of serving the country with science and technology as the dual cores, the reform of ideological and political education in the course is carried out from five dimensions: sorting out ideological and political elements, constructing a three-dimensional practical path, developing a course ideological and political case library, building a three-dimensional evaluation system of "knowledge-ability-literacy", and constructing a cross disciplinary collaborative education mechanism. Through the full process of "research preparation - resource construction - teaching practice - achievement optimization - promotion and application", the reform is implemented to construct a three-dimensional teaching path of "theoretical integration - practical strengthening - post class sublimation", develop an ideological and political case library that is suitable for course knowledge points, and improve the education evaluation mechanism. Teaching practice has shown that this reform model can achieve the integration of professional knowledge imparting, engineering ability cultivation, and value shaping, effectively solving the problem of rigid integration of ideological and political education in engineering courses. It can provide replicable practical references for the ideological and political construction of computer related courses in similar universities.

**Keywords:** Course Ideology and Politics; Computer Network; Craftsmanship Spirit; Science and Technology Serving the Country.

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## 1. Introduction

The strategy of building a strong cyber nation has put forward new requirements for the cultivation of engineering talents. Higher education institutions not only need to cultivate technical talents who master professional skills such as network protocols, networking technology, and network security, but also need to cultivate new generation engineering and technical personnel with rigorous and standardized craftsmanship spirit and a sense of independent and self-reliant science and technology to serve the country [1]. Computer Network is a core foundational course for majors in Data Science and Big Data Technology, Computer Science and Technology, and Electronic Information. The course has a wide audience and combines theoretical and practical aspects, naturally carrying opportunities for ideological and political education such as network security, network sovereignty, and domestic network technology innovation. It is an important carrier for carrying out ideological and political construction in engineering courses.

There are still many practical pain points in the ideological and political construction of the "Computer Network" course in current application-oriented undergraduate colleges: the teaching process focuses on explaining technical content such as TCP/IP protocol and routing and switching configuration, and lacks exploration of professional ethics and patriotism; Fragmentation of ideological and political content, with rigid

and labeled implantation; Lack of a dedicated ideological and political case library that adapts to the technical knowledge points of the course; Practical teaching activities such as networking training and network attack and defense focus more on operational results and less on cultivating engineering literacy; The lack of quantifiable evaluation criteria for the effectiveness of ideological and political education in courses; The long-term mechanism of collaborative education between professional course teachers and ideological and political teachers has not been fully established, which hinders the improvement of the effectiveness of ideological and political education in the curriculum [2].

This project is based on the positioning of cultivating application-oriented and composite talents in our university. With the spirit of craftsmanship (rigorous standards, excellence, responsibility, and dedication to work) and the sentiment of serving the country through science and technology (independent innovation, technological self-improvement, network sovereignty, and serving the country) as the dual cores, we will carry out the ideological and political reform of the "Computer Network" course, construct a practical path that can be implemented, build a supporting ideological and political case library, improve teaching evaluation and collaborative education mechanism, and explore the implementation mode of ideological and political courses suitable for application-oriented undergraduate

engineering majors [3].

## 2. The Implementation Foundation of Ideological and Political Education Reform in The Curriculum

As an applied undergraduate institution, our school's computer and big data majors undertake the task of cultivating talents to serve the development of regional digital economy and meet the needs of network power [4]. The accumulation in the early stage of the course provides supporting conditions for the implementation of the reform of this project.

In terms of teaching resource foundation, the "Computer Network" course has built teaching syllabus, teaching plan, practical training guide, test question bank, courseware, preliminary course ideological and political teaching plans and other teaching resources based on the Chaoxing Learning Platform. It has accumulated a large amount of online and offline teaching data, which can be used to iteratively optimize key and difficult points and ideological and political adaptation points based on teaching data. Relying on the construction of Tencent Cloud Industry College, majors can connect with industry training resources, realizing mutual empowerment between professional teaching reform and industry talent cultivation.

On the basis of the team, the project will establish an interdisciplinary teaching team, including ideological and political teachers from the School of Marxism and full-time teachers from the School of Computer Science. The team will all have frontline classroom teaching experience and have a foundation in curriculum and teaching research; The team regularly participates in teaching reform seminars and teaching exchange activities, providing personnel support for interdisciplinary collaborative lesson preparation and case

joint development.

At the level of institutional guarantee, the school has issued relevant documents for the construction of teaching quality engineering and the management of teaching reform project funds, providing funding and institutional guarantees for this project; The college introduces enterprise practical training and guest professor resources to support teachers' enterprise practice and promote the construction of a dual teacher team, which can ensure the integration of curriculum ideological and political reform with industry practical needs.

## 3. Overall Design of Ideological and Political Reform in the Curriculum

### 3.1. Core Objectives of Reform

The reform adheres to the fundamental task of cultivating morality and talents, targeting application-oriented undergraduate computer students, and achieves five goals: firstly, to build a three in one curriculum ideological and political system of "knowledge points, ideological and political points, and practical points", and to break the "two skins" of professional teaching and ideological and political education. Secondly, establish a dedicated ideological and political case library and supporting teaching resources for the course "Computer Networks". Thirdly, innovate the dual core driven curriculum ideological and political teaching mode to achieve the unity of knowledge imparting, ability cultivation, and value shaping. Fourthly, establish a three-dimensional evaluation system of "knowledge+ability+literacy" to achieve observable and quantifiable educational effects. Fifth, establish a replicable and promotable path for ideological and political practice in engineering courses, providing a demonstration for other engineering courses on campus and similar colleges. As shown in Fig. 1.

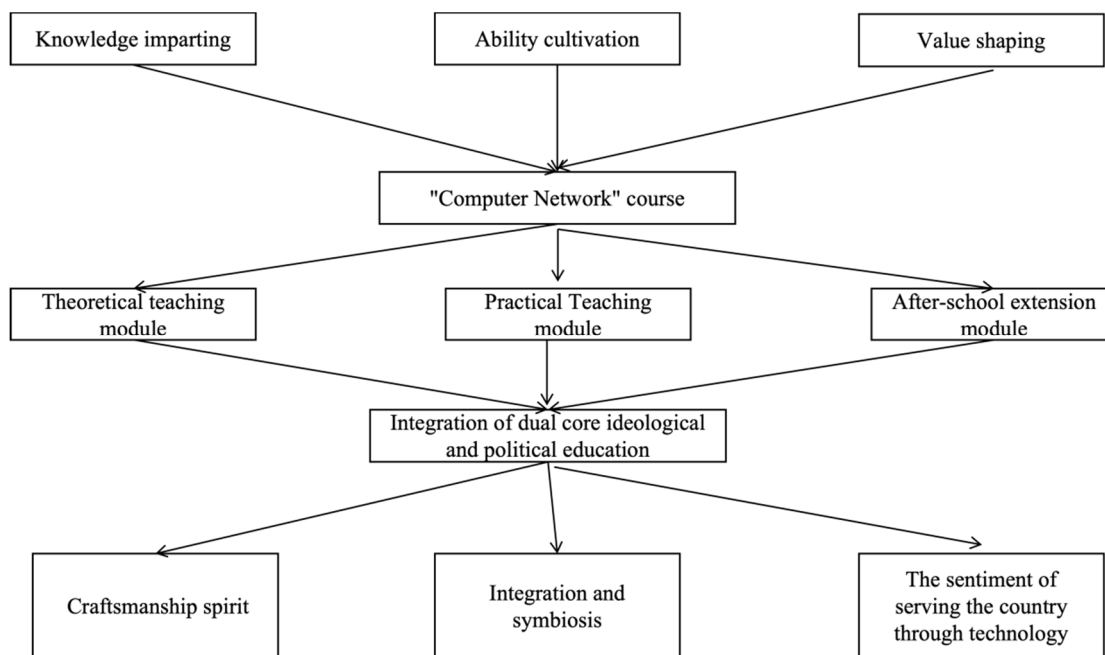


Fig 1. The logical framework diagram integrating ideological and political education into the curriculum

### 3.2. Proposed Solutions to Key Issues

In response to the pain points in teaching reality, the reform focuses on five key issues: firstly, to solve the problem of scattered exploration of ideological and political elements,

disconnection from knowledge points, and rigid implantation. The second is to solve the dilemma of lacking a course specific ideological and political case library, and frontline teachers having no suitable teaching resources available. The third is to solve the problem of the lack of craftsmanship spirit

and patriotism in practical teaching, and the emphasis on operation over literacy. The fourth is to address the shortcomings of the evaluation of the effectiveness of ideological and political education in the curriculum, which is difficult to quantify and solely based on scores. The fifth is to improve the interdisciplinary collaborative education mechanism and fill the gaps in the theoretical and professional cognition of ideological and political education teachers in professional courses.

### **3.3. Overall Implementation Strategy for the Reform**

The project is divided into four implementation stages based on problem orientation—resource construction—teaching practice—achievement optimization—promotion and application. In the first stage, research and preparation are carried out, and questionnaires and teacher discussions are conducted to sort out existing problems in the curriculum. The exploration of ideological and political elements in each chapter of the curriculum is completed, and a corresponding list of "knowledge points—ideological and political points—integration methods" is established.

The comprehensive application of literature research method, research and analysis method, case development method, teaching experiment method, data analysis method, and interdisciplinary collaboration method in the reform ensures the scientific and practical nature of the reform.

## **4. Construction of Ideological and Political Practice Path for The Course of "Craftsmanship Spirit+Technology Serving the Country"**

This project constructs a three-dimensional practical path of theoretical integration—practical strengthening—post class extension and sublimation, covering the entire teaching process of classroom teaching, experimental training, and post class expansion, without changing the overall framework of the original curriculum, making it easy for frontline teachers to implement.

### **4.1. Theoretical Teaching: Case Introduction+Problem Driven+Value Sublimation**

The theoretical classroom adopts a case-based and problem driven teaching mode. Each class introduces the spirit of craftsmanship or relevant cases of science and technology serving the country based on the knowledge points, explains the principles of network technology, and simultaneously carries out value guidance. At the end of the class, a 3-minute ideological and political summary is set up. When explaining network protocol standards, introducing the story of rigorous verification in the protocol development process conveys the spirit of craftsmanship; Explain network security IPv6. Knowledge points related to domestic network equipment, introducing cases of independent innovation in China's network technology, explaining the concept of network sovereignty and overall national security, naturally infusing patriotism into technology explanations, and avoiding the separation of ideological and political education and technology teaching [5].

### **4.2. Practical Teaching: Implanting Dual Internal Nuclear Nutrition Targets in The Practical Training Session**

The course of Computer Networks includes a large amount of practical teaching content such as networking training, network attack and defense experiments, and comprehensive project design. Strengthen the requirement of craftsmanship spirit in practical training assessment, emphasize operational norms, rigorous and meticulous troubleshooting, complete and standardized documentation, and change the current situation where students only pursue completing experimental operations. Design practical tasks with a technology oriented approach to serving the country, such as "Campus Network Network Design Based on Domestic Network Equipment" and "Key Information Infrastructure Protection Training", to guide students to understand the value of domestic network technology through hands-on practice, think about the practical significance of network technology serving national network security, and achieve the integration of knowledge and action [6,7].

### **4.3. After Class Extension and Expansion to Achieve Value Sublimation**

Based on online learning platforms, assign expansion tasks, research short articles on the development of domestic network technology, and homework on network ethics thinking; Organize a theme sharing activity on the spirit of craftsmanship, guide students to independently explore the development history of China's network technology, actively establish the connection between technology learning and national development, and extend classroom value guidance beyond the classroom.

## **5. Main Content**

### **5.1. Construction of a Case Library for Ideological and Political Education in Courses**

Cases are the core teaching resources for the implementation of ideological and political education in courses. The project focuses on developing no less than 15 typical teaching cases around the core modules of the curriculum. All cases are accompanied by knowledge point related explanations, interpretation of ideological and political connotations, classroom teaching implementation steps, and teaching evaluation points, forming a standardized resource package. The cases are divided into three categories:

The first type is the case of craftsmanship spirit, selecting cases such as iterative network protocol standards, front-line operation and maintenance of network engineers, and large-scale network troubleshooting, to convey the professional qualities of rigor, excellence, and dedication to work; The second category is cases of science and technology serving the country, selecting topics such as domestic firewall research and development, large-scale deployment of IPv6 in China, and protection of critical information infrastructure, to interpret the era connotation of the strategy of building a strong network country, network sovereignty, and technological self-reliance; The third type is the case of dual core integration, which uses the deployment of domestic network equipment and the implementation of domestic network technology projects as carriers, while reflecting the rigorous and meticulous craftsmanship spirit of project

implementation and the scientific and technological patriotism of independent innovation.

The case library takes into account both theoretical classroom and practical teaching scenarios, as well as cutting-edge technologies. It integrates cutting-edge technology cases such as 5G, SDN, NFV, and IoT networks to ensure that teaching content keeps up with industry development. Case resources can be flexibly tailored and adjusted according to different professional teaching needs, with strong reusability [8,9].

## **5.2. Construction of a Three-Dimensional Evaluation System For "Knowledge-Ability-Literacy"**

Breaking the traditional "score only" evaluation system based on final exams in courses, a three-dimensional comprehensive evaluation system is established, incorporating the spirit of craftsmanship and the desire to serve the country through science and technology into quantifiable assessment indicators. The total evaluation score is composed of 40% knowledge dimension, 30% ability dimension, and 30% literacy dimension.

**Knowledge dimension:** Assessing the mastery of basic knowledge in the field of networking, incorporating ideological and political oriented questions that combine network security and network sovereignty into the test paper, and examining students' understanding of the national strategy behind technology;

**Ability dimension:** Evaluate network configuration, troubleshooting, and team collaboration, with a focus on assessing the standardization of practical training operations and the rigor of documentation. Score the craftsmanship spirit demonstrated by students in the practical process in a process oriented manner.

**Literacy dimension:** By collecting data through multiple channels such as classroom performance, extracurricular assignments, practical training reports, and anonymous survey questionnaires, evaluate students' rigorous and dedicated professional consciousness, responsibility for serving the country through science and technology, and network ethics literacy, and achieve observable effects on ideological and political education in the curriculum.

## **5.3. Construction of Interdisciplinary Collaborative Education Mechanism**

Course ideological and political education cannot rely on professional course teachers to work alone. The project establishes an interdisciplinary collaborative team working mechanism consisting of computer science teachers and ideological and political teachers from the School of Marxism. Regularly carry out collaborative lesson preparation, case studies, and classroom observations, with ideological and political teachers participating in the review of the ideological and political content of cases, and professional teachers ensuring the accuracy of case technology, complementing each other in both directions. On the one hand, it helps professional course teachers grasp the connotation of ideological and political theory, avoiding deviations in ideological and political interpretation; On the other hand, it helps ideological and political teachers understand the technical content of engineering courses and overcome cross disciplinary knowledge barriers. At the same time, establish a teaching reflection system, regularly review the effectiveness of classroom practice by the team, iterate and optimize case

studies, teaching design, and evaluation indicators, and form a long-term guarantee for collaborative education [9,10].

## **5.4. Reform Characteristics and Innovation**

Firstly, the ideological and political core focuses precisely on the characteristics of engineering disciplines. This reform does not use generalized ideological and political themes, but firmly grasps the dual core of craftsmanship spirit and the sentiment of serving the country through science and technology. It deeply integrates with the technical scene of online courses, achieving depth in technology and warmth in ideological and political education, effectively avoiding label based ideological and political education.

Secondly, the three-dimensional practical path has strong operability. Constructing a complete process path for theoretical practice after class does not require restructuring the curriculum system. Frontline teachers can directly draw on and use it, reducing the threshold for implementing ideological and political education in the curriculum.

Thirdly, develop a course specific case resource package. All cases are bound to course knowledge points, accompanied by teaching plans and evaluation points. Standardized resources are easy to promote and reuse within the school and even similar institutions.

Fourth, innovate interdisciplinary collaborative education models. Establish a regular joint development mechanism between professional course teachers and ideological and political education teachers, and improve the pattern of curriculum ideological and political education and the collaborative education of ideological and political courses.

Fifth, achieve quantitative evaluation of ideological and political education. The three-dimensional evaluation system incorporates literacy goals into formal assessments, solving the problem of "not receiving high praise and being unable to evaluate" ideological and political courses.

Sixth, the teaching content should keep up with the forefront of the industry, integrate new generation network technology into case studies, and balance the practicality and timeliness of talent cultivation.

## **6. Reform Effectiveness and Reflection**

Through teaching practice, the reform of this topic has achieved results in multiple aspects. From a teaching perspective, ideological and political elements are organically integrated with professional teaching, and students' classroom participation is increased. Most students can understand the national strategic significance behind network technology. In practical training, students' operational norms and engineering document quality are improved, and their sense of patriotism and network security responsibility is strengthened. At the teacher level, the ability of professional course teachers participating in the project to design ideological and political education courses has been improved, and the interdisciplinary collaborative teaching and research model provides reference for the ideological and political construction of other courses in the college. Project output includes case library resources, educational reform research reports, teaching papers, and other tangible achievements.

At the same time, in the practice of reform, it has also been found that there are areas that need to be continuously optimized: firstly, the teaching time of some case classes needs to be further streamlined and adapted according to the class hours; Secondly, although the evaluation of literacy has been quantified, there is still a certain subjectivity in the

collection of subjective attitude indicators among students. Further optimization of questionnaires and process recording tools can be carried out in the future; Thirdly, the case library can continue to expand real engineering cases on the front line of enterprises, further meeting the talent needs of the industry.

## 7. Summary

In response to the demand for talent cultivation in the era of a strong cyber nation, the application-oriented undergraduate course "Computer Networks" has launched a course ideological and political reform with the dual core of craftsmanship spirit and technology serving the country. Through systematic exploration of ideological and political elements, three-dimensional teaching practice path, exclusive case library construction, three-dimensional comprehensive evaluation system, and interdisciplinary collaborative education mechanism, the complete loop from teaching design, resource construction, classroom implementation to effect evaluation has been opened up, effectively solving the practical problem of "two skins" of ideological and political education in engineering courses.

The construction of ideological and political education in engineering courses is a continuous iterative process, and it is necessary to continuously update case resources, optimize teaching design in combination with the development of network technology, and integrate value shaping throughout the entire process of talent cultivation, cultivating more applied network engineering talents who understand technology, have literacy, and have national responsibilities. The practical path and resource construction experience formed by this project can provide reference for the ideological and political construction of similar engineering courses.

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## References

- [1] Wang, S. (2026). Construction of a multi-dimensional integrated teaching system for curriculum ideological and political education in computer networks. In 2026 International Conference on Distance Education and Learning (ICDEL) (pp. 1–6). Hangzhou, China.
- [2] Huang, M., Peng, S., & Yuan, H. (2025). Exploration and practice of deep learning classroom teaching of "computer network" course based on the integration of specialization and innovation. In 2025 5th Asia Conference on Information Engineering (ACIE) (pp. 154–158). Phuket, Thailand.
- [3] Zhang, Y. (2026). Reform on the course of data communication and computer network based on blended learning. In 2026 International Conference on Distance Education and Learning (ICDEL) (pp. 362–366). Hangzhou, China.
- [4] Li, X. Y., & Wang, X. L. (2026). The ideological and political reform of computer network courses under the strategy of building a strong cyber nation. *Journal of Science and Technology in Normal Universities*, 46(4), 91–95.
- [5] Liu, S. S. (2025). Teaching reform practice of computer network technology major in higher vocational education under the concept of course ideology and politics: Taking the course of "LAN switching technology" as an example. *Journal of Hunan Industrial Vocational and Technical College*, 25(3), 122–126.
- [6] Zhou, H. Y., Wang, H. X., Zhang, Q. R., et al. (2023). Exploration and practice of ideological and political education in computer network courses. *Computer and Information Technology*, 31(6), 121–124.
- [7] Chang, X. H., Li, G. X., Luo, X., et al. (2025). Exploration of task driven "one line, two chains" ideological and political education in computer basic courses. *Computer Education*, (7), 27–33.
- [8] Wang, J. J., Du, H. H., Cui, X. B., et al. (2025). Exploration of computer network ideological and political education. *Computer Education*, (10), 163–167.
- [9] Yu, C. M., & Yu, C. J. (2023). Classroom teaching design integrating ideological and political education into curriculum based on BOPPPS teaching model. *Computer and Telecommunications*, (11), 57–60, 64.
- [10] Cai, X. Y. (2025). Exploration of multidimensional paths for ideological and political construction of computer network technology courses in higher vocational education from the perspective of "hardware". *Journal of Xiangyang Vocational and Technical College*, 24(4), 64–67, 119.