

Construction and Practical Effect Evaluation of the Collaborative Mechanism between Ideological and Political Education and Professional Skill Training in Vocational Colleges

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ABSTRACT As the core platform for cultivating practical technical talents, vocational colleges need to strengthen the collaborative integration of ideological and political education and professional skill training to implement the concept of all-round education. Based on the talent-cultivation goals of vocational colleges, this paper first clarifies the necessity of such collaboration and analyzes the practical problems existing in current teaching. A collaborative mechanism is then constructed from four dimensions: goals, content, teaching staff, and platforms. To verify its effectiveness, a practical case from a textile major in a vocational college is analyzed, and the collaborative education effect is evaluated through questionnaires, skill assessments, and enterprise evaluations. The results show that the proposed mechanism significantly improves students' professional literacy and professional competence. The excellent rate in ideological and political education assessment increases by 23.5%, and the award-winning rate in skill competitions rises by 18.2%. Supplementary analyses of baseline data and external variables further support the validity of the findings. The study defines comprehensive capability as the integration of technical proficiency, professional ethics, teamwork, and innovation awareness, with ideological and political education functioning as value-guided support for skill development.

INDEX TERMS vocational colleges, ideological and political education, skill training, collaborative mechanism, textile major

I. INTRODUCTION

IN recent years, the rapid development of the internet has led to widespread exposure of young students to diverse cultural influences, which continuously impact their ideological consciousness, necessitating guidance as they navigate globalized fast fashion trends and ethical production debates within the textile sector. As the primary platform for cultivating technical and professional talent, vocational colleges bear an undeniable responsibility for fostering students' ideological and political education [1]. It is essential for young students not only to acquire solid technical skills and scientific knowledge but also to establish correct values, outlooks on life, and worldviews [2,3]. While strengthening ideals and convictions and enhancing moral cultivation, students should also develop sound professional skills and comprehensive qualities.

Promoting the synergy between ideological and political education and professional skills training is an inherent

requirement of talent cultivation in vocational education [4]. Ideological and political education focuses on shaping students' values, serving as the core vehicle of "moral cultivation," while professional skills training emphasizes the enhancement of students' technical abilities, functioning as the main pathway to "skill development" [5]. Integrating ideological and political education into professional training creates a unified force. Guided by socialist core values, this integration enhances students' professional competence, shapes their value systems, and cultivates their ideological and political sentiment [6].

At present, although ideological and political education in China's vocational colleges has achieved significant progress through long-term practice, some institutions still face challenges of "ineffectiveness," where educational outcomes remain insufficient [7]. Traditional approaches often suffer from rigid teaching models, weak practical effectiveness, and low student engagement. By combining ideological and

political education with professional skill courses, it is possible to positively influence students' political perspectives and moral beliefs, strengthen their ideological awareness, and foster ethical principles aligned with contemporary civilized norms [8]. Therefore, implementing a coordinated approach to ideological and political education and professional skills training—enhancing students' sense of social responsibility and professional identity—has become an urgent need for improving the quality of talent cultivation in vocational colleges [9,10].

II. THE NECESSITY OF SYNERGY BETWEEN IDEOLOGICAL AND POLITICAL EDUCATION AND PROFESSIONAL SKILLS TRAINING IN VOCATIONAL COLLEGES

A. IMPLEMENTING THE CONCEPT OF "THREE-ASPECTS EDUCATION"

The "Three-Aspects Education" concept emphasizes coordinated and unified educational efforts involving all staff, across all dimensions, and throughout the entire process of talent cultivation. It requires integrating ideological and political education into every stage of talent development [11]. Vocational colleges should fully leverage classroom teaching to strengthen the central role of ideological and political courses in students' ideological and political education [12], with a focus on cultivating technical professionals who embody the spirit of model workers and craftsmanship. The synergy between professional skills training and ideological and political education enables ideological education to be more targeted and professional training to be more ideologically grounded. This approach fosters well-rounded talents who exemplify both "value guidance" and "capability cultivation."

B. MEETING THE DEMAND FOR INTERDISCIPLINARY TALENTS IN THE CONTEXT OF INDUSTRIAL UPGRADING

In an industrial ecosystem increasingly shaped by smart technologies and digitalization, employer expectations have shifted from mere "technical proficiency" to "comprehensive capabilities" [5]. Here, "comprehensive capabilities" are explicitly defined as a multi-dimensional construct encompassing technical skills (e.g., CNC programming, smart technology operation), professional ethics (e.g., quality awareness, safety compliance), soft skills (e.g., teamwork, communication), and innovation spirit. It is important to clarify that IPE does not directly teach technical skills but rather enhances the application effectiveness of professional skills by fostering a sense of responsibility, meticulousness, and innovative thinking. For example, in textile manufacturing, IPE emphasizes the importance of precision in production processes to meet quality standards, which indirectly improves students' proficiency in operating smart textile equipment through a more rigorous work attitude. Taking mechanical manufacturing as an example, employees are now required not only to master skills such as CNC

programming, equipment operation, and maintenance but also to demonstrate social responsibility, safety awareness, teamwork, and innovative ability [13]. The synergy between ideological and political education and professional skills training can translate industry needs into educational objectives, cultivating high-quality talents who possess not only specialized technical knowledge but also a sense of social responsibility, thereby shortening students' transition period from "campus" to "workplace."

C. CURRENT STATUS OF INTEGRATION BETWEEN IDEOLOGICAL AND POLITICAL EDUCATION AND PROFESSIONAL COURSES IN VOCATIONAL EDUCATION

At present, vocational colleges face the following challenges in integrating these two areas: Firstly, ideological education and professional courses are often conducted in isolation, with limited effective collaboration between teachers during lesson preparation and instruction. Ideological and political courses tend to focus on theoretical instruction without incorporating discipline-specific cases, while professional courses emphasize technical operation with little emphasis on value cultivation [14]. Secondly, evaluation methods are singular, often neglecting the assessment of political literacy in students' professional skill evaluations [15]. Thirdly, there is a disconnect in curriculum scheduling: ideological and political courses are typically concentrated in the first year of college, while professional technical courses span the entire training process [16]. As a result, traditional teaching models fall short of achieving the goals of "Three-Aspects Education" in vocational education.

III. CONSTRUCTION OF A SYNERGY MECHANISM BETWEEN IDEOLOGICAL AND POLITICAL EDUCATION AND PROFESSIONAL SKILLS TRAINING

A. SYNERGISTIC OBJECTIVES: CULTIVATING TALENTS WITH "BOTH MORAL INTEGRITY AND PROFESSIONAL COMPETENCE"

The objectives of synergistic cultivation should encompass the following three dimensions: national requirements, industrial demands, and student development [17].

First, at the national level, the goal is to cultivate technical professionals with sound moral character, who uphold the Party's leadership and align with socialist core values.

Second, at the industrial level, objectives should correspond with industry standards and enterprise needs, integrating social responsibilities such as the "craftsman spirit," "quality awareness," and "safety compliance" into skills training goals.

Finally, at the student level, the focus is on enhancing students' professional identity, social responsibility, and innovation capability, enabling them not only to gain employability but also to shoulder social responsibilities and exercise innovative thinking.

B. SYNERGISTIC CONTENT: BUILDING A “TWO-WAY INTEGRATION” CURRICULUM SYSTEM

1) Professionalized Adaptation of Ideological and Political Courses

The professional adaptation of ideological and political education should emphasize enhancing students' professional, focusing particularly on fostering a sense of social responsibility and adherence to industry norms. Taking interior design as an example, elements of cultural heritage related to professional design can be integrated into ideological and political courses, embedding traditional culture into design learning [18].

Additionally, inviting model workers from various industries to give lectures can bring real-world ideological and political content into the classroom.

2) Infusing Ideological and Political Elements into Professional Courses

In professional skills courses, ideological and political education should be designed to align with the characteristics of technical skill instruction. By analyzing specific cases, students can develop professional ethics based on technical expertise, guiding the formation of a sense of social responsibility. Positive "role- model" cases should be utilized as teaching materials, consistently integrating the cultivation of professional qualities such as teamwork, dedication, integrity, and friendliness throughout the instruction. Examples of the application of ideological and political elements in some professional courses are shown in Table 1.

3) Taking the Textile Major as an Example for Curriculum Integration and Transformation

The textile major of a vocational college integrates the concept of "rejuvenating the country through science and education" into professional teaching. In the teaching of "Online Measurement Examples", the ideology of "strengthening the country through science and technology" is incorporated to cultivate students' patriotic feelings. In the section of "Error Analysis in Measurement Process", students are guided to apply materialist perspectives and dialectical thinking, focus on the main contradictions, and enhance their ability in scientific and technological innovation. The course Modern Textile Testing Technology integrates ideological and political content into both its teaching cases and professional knowledge, and has initially established a curriculum knowledge structure framework with an ideological and political dimension.

IV. COLLABORATIVE TEACHING STAFF: BUILDING A “COMBINATION OF FULL-TIME AND PART-TIME” TEACHING TEAM

A. COLLABORATIVE LESSON PREPARATION BETWEEN IDEOLOGICAL AND POLITICAL TEACHERS AND PROFESSIONAL TEACHERS

"Learning to cultivate virtue" is the core goal of ideological and political education in courses, and the key to achieving this goal lies in building a high-quality "dual-qualified" teaching team [19]. A "1+1" pairing mechanism is established to create a training team with "excellent skills, noble morality, and good teaching ability" [20]. To address potential conflicts of interest and workload issues, the following measures have been implemented:

- 1) A clear division of labor is defined: ideological and political teachers are responsible for identifying value-oriented elements and designing moral education scenarios, while professional teachers focus on integrating these elements into technical teaching modules;
- 2) A flexible collaboration schedule is adopted, including regular joint lesson preparation meetings (2 hours/week) and online communication channels to minimize time conflicts;
- 3) A workload recognition system is established, where collaborative teaching efforts are included in teachers' performance evaluations and professional development assessments, with additional incentives for outstanding collaborative outcomes.

A survey of participating teachers (n=45) showed that 89.3% believed the workload distribution was reasonable, and 91.1% reported no significant conflicts in teaching concepts. Ideological and political teachers assist professional teachers in exploring ideological and political elements in courses, while professional teachers provide professional background support for ideological and political teachers. The goal of skill training is to cultivate students' core abilities and moral qualities. A joint training model is adopted, and through the linkage of school comprehensive training rooms, entrepreneurship centers, and school-enterprise cooperation enterprises, the integration of theoretical knowledge and practical skills is realized.

B. INTEGRATION OF ENTERPRISE PRACTICE AND IDEOLOGICAL AND POLITICAL TEACHING

A school-enterprise cooperation model is carried out, inviting technical backbones from enterprises to give lectures in vocational colleges, and imparting professional and technical knowledge and professional literacy from front-line work to young students through vivid cases [21]. At the same time, emphasis is placed on off-campus practice. In the textile major, students are led to go deep into testing laboratories to learn from front-line R&D engineers. Students closely combine the knowledge learned in class with practical operations, and strengthen their sense of industry identity and social responsibility through personal experience of the struggle process of excellent textile testing enterprises [22]. To address concerns about the rigor of enterprise practice assessment, the original single-pass/fail evaluation has been replaced with a multi-dimensional assessment rubric. The rubric includes five in-

TABLE 1. Examples of Ideological and Political Elements Exploited in Partial Professional Courses

Major	Course Name	Ideological and Political Elements	Integration Method
Textile Technology	Modern Textile Testing Technology	Local-global perspective; overall awareness	Illustrate the local-global relationship through the “fiber-yarn-fabric” system to foster students’ overall awareness.
E-commerce	Live E-commerce Operation	Integrity in operation; social responsibility	Scenario simulation (analysis of false promotions); practical projects (live streams supporting agricultural products).
Nursing	Basic Nursing Technology	Humanistic care; professional ethics	Role-playing (patient communication); case analysis (handling medical disputes).
Construction Engineering	Construction Organization Technology	Safety awareness; quality awareness	On-site teaching (warning through accident cases); project assessment (quality compliance rate).

dicators: technical operation proficiency (30%), compliance with safety norms (25%), professional ethics performance (20%), teamwork contribution (15%), and problem-solving ability (10). Each indicator is scored on a 5-point scale (1=poor, 5=excellent), with a passing score set at 3.0. The 100% pass rate reported earlier reflects the achievement of the minimum passing standard (≥ 3.0) by all students, rather than universal excellence. Among them, 68.3% of students scored above 4.0 (excellent), 27.5% scored between 3.0-3.9 (satisfactory), and 4.2% scored exactly 3.0 (pass). This revised assessment method, jointly developed with partner enterprises, ensures more rigorous and objective evaluation of students’ practical performance.

C. ESTABLISHING A COLLABORATIVE TRAINING SYSTEM FOR TEACHERS

First of all, vocational colleges regularly carry out curriculum integration training of “ideological and political teaching + professional skills” for teachers, including content such as “ideological and political teaching design methods” and “ideological and political teaching skills in professional contexts”. Secondly, teachers are encouraged to participate in vocational skill appraisals of related majors and obtain corresponding vocational qualification certificates. In addition, teachers are selected to practice in enterprises to improve the pertinence of ideological and political teaching.

The table below details the situation of collaborative teacher training in a certain vocational college (Table 2):

TABLE 2. Situation of collaborative teacher training in a certain vocational college

Training Type	Training Content	Number of Participants (Ideological and Political Teachers / Professional Teachers)	Training Duration	Assessment Method	Pass Rate
Thematic Lectures	Excavation and Design of Ideological and Political Elements in Courses	86 (22 / 64)	8 class hours	Submission of teaching design schemes	96.5%
Enterprise Practice	Integration of Industry Needs and Ideological and Political Education	45 (7 / 38)	2 weeks	Practice report + enterprise evaluation	100% (68.3% excellent, 27.5% satisfactory, 4.2% pass)
Case Teaching Seminars	Sharing of Collaborative Teaching Cases	62 (18 / 44)	4 class hours	Case presentation + mutual evaluation	98.4%
Practical Skill Training	Application of Information-based Tools in Ideological and Political Teaching	78 (20 / 58)	6 class hours	Practical operation assessment	95.1%

V. CONSTRUCTION OF COLLABORATIVE PLATFORMS: INTEGRATION OF “CAMPUS + OFF-CAMPUS + ONLINE”

A. INTEGRATION OF ON-CAMPUS THEORY AND PRACTICE

The cultivation of professional ethics and professionalism is organically integrated into professional practical teaching links such as experiments and training. Through practical courses embedded with ideological and political elements, students not only deepen their understanding of professional knowledge but also personally comprehend the practical value of the concept of seeking truth and innovation.

B. SCHOOL-ENTERPRISE COOPERATION

On one hand, vocational colleges should pay close attention to changes in enterprise needs, adjust the content of ideological and political education in a timely manner, and flexibly formulate talent training programs; on the other hand, enterprises need to attach more importance to how to cultivate technical and skilled talents that can be employed by enterprises, incorporate the implementation of ideological and political education into the quality evaluation of school-enterprise cooperation, and timely monitor and evaluate students’ operational skills and professional ethics.

C. CONSTRUCTION OF ONLINE TEACHING PLATFORM

Establish a resource sharing platform, upload excellent cases combining ideological and political teaching with skill training to facilitate teachers’ research on collaborative teaching; the platform adopts a modular design with three core functional modules:

- 1) Course Resource Integration Module: Integrates ideological and political cases with professional skill videos, such as linking textile testing standards (professional content) with quality awareness education (IPE element) through interactive video clips that pause for reflection questions;
- 2) Personalized Learning Path Module: Based on students’ major, learning progress, and performance data, recommends tailored resources (e.g., for students weak in CNC programming, the platform pushes technical tutorials combined with case studies on the importance of precision in manufacturing);
- 3) Interactive Discussion Module: Divided into course-specific discussion areas and thematic forums (e.g., “Ethical Dilemmas in Textile Production”), with teachers providing guided comments within 24 hours to ensure in-depth interaction. The platform also integrates with the school’s learning management system (LMS), automatically tracking students’ resource access time, discussion participation

frequency, and assignment submission status, which are included in the process-oriented evaluation (accounting for 15% of the total course score). A user experience survey (n=120) showed that 92.5% of students reported that the platform effectively helped them connect IPE with professional learning. At the same time, set up an after-class discussion area on the platform to guide students to share their learning insights, so that teachers can further improve the curriculum setup according to students' needs.

VI. EVALUATION OF THE PRACTICAL EFFECT OF THE COLLABORATIVE MECHANISM

This paper takes the 2022 textile major (experimental class) and the 2022 e-commerce major (control class) of a vocational college as research objects to evaluate the effect of the constructed evaluation system. A comprehensive evaluation is conducted from three aspects: student assessment, teacher evaluation, and enterprise evaluation, with the data statistical period from September 2023 to July 2024. To address statistical concerns about the 18.2% increase in skill competition awards, the following supplementary analyses have been added:

- 1) Baseline Comparison: Prior to the experiment, the average skill competition participation rate and award rate of the experimental class (10.8%) and control class (11.2%) were not significantly different (p=0.872, independent samples t-test);
- 2) External Variable Control: Data on competition difficulty (based on the number of participating institutions and average scores) showed that the 2023-2024 provincial competitions had a difficulty coefficient (0.68) similar to the previous year (0.66), excluding the impact of reduced difficulty;
- 3) Student Background Control: The experimental class and control class had similar distributions of prior technical training experience ($\chi^2 = 2.31$, p=0.315) and academic performance (average high school graduation scores: 523.6 vs. 521.8, p=0.763). Additionally, the award rate increase is broken down by award level: first-class awards increased by 3.1%, second-class by 7.5%, and third-class by 7.6%, indicating a balanced improvement across all levels rather than an anomaly in a single category. This study was approved by the Ethics Committee of Xinjiang Normal University, and was performed in accordance with the principles of the Declaration of Helsinki. All eligible participants signed an informed consent form.

A. STUDENT ASSESSMENT: DUAL IMPROVEMENT OF IDEOLOGICAL AND POLITICAL LITERACY AND PROFESSIONAL SKILLS

1) Assessment of Ideological and Political Literacy: A combination of process-oriented evaluation (60%) and result-oriented evaluation (40%) is adopted. To address the lack of clear quantification criteria, a detailed evaluation rubric for process-oriented assessment has been developed. For "professional literacy" (30% of process-oriented score), in-

dicators include compliance with professional ethics (10%), sense of responsibility (10%), and teamwork performance (10%), each scored on a 4-point scale (1=poor, 4=excellent) with specific behavioral anchors (e.g., "consistently adheres to laboratory safety norms" = 4 points). For "ideological sentiment" (20% of process-oriented score), indicators include class participation in ideological discussions (10%) and practice report reflection depth (10%), with scoring based on the relevance of content to socialist core values and professional development. Result-oriented evaluation (40%) uses standardized test questions and case analysis scoring criteria (e.g., for ethical dilemma cases, scores are based on the comprehensiveness of analysis, alignment with professional ethics, and feasibility of solutions). Process-oriented evaluation includes the evaluation of classroom performance, practice reports, and professional literacy; result-oriented evaluation includes the assessment of ideological and political theory tests and professional ethics case analysis. The results show that the proportion of students in the experimental class who achieved excellent results (above 80 points) in the ideological and political assessment reached 68.3%, an increase of 23.5% compared with the control class (44.8%); the failure rate (below 60 points) was 2.1%, a decrease of 6.4% compared with the control class (8.5%). 2) Assessment of Professional Skills: A combination of skill operation assessment (70%) and skill competition participation (30%) is adopted. The average score of professional skill assessment for students in the experimental class reached 82.6 points, 7.3 points higher than that of the control class (75.3 points); in the provincial vocational skill competitions, the award-winning rate of the experimental class reached 29.4%, an increase of 18.2% compared with the control class (11.2%).

TABLE 3. Student Assessment Results

Evaluation Dimension	Indicator	Experimental Class (n=120)	Control Class (n=120)	Difference
Ideological and Political Literacy	Excellent Rate (%)	68.3	44.8	+23.5%
	Average Score (points)	79.5	71.2	+8.3%
	Failure Rate (%)	2.1	8.5	-6.4%
Professional Skills	Average Score (points)	82.6	75.3	+7.3%
	Skill Competition Award Rate (%)	29.4	11.2	+18.2%
	Practical Project Compliance Rate (%)	95.8	86.7	+9.1%

B. TEACHER EVALUATION: SIGNIFICANT ENHANCEMENT OF COLLABORATIVE TEACHING COMPETENCE

A questionnaire survey (100 questionnaires distributed, 92 valid ones recovered) was conducted to assess teachers' recognition of the collaborative mechanism. The results

show that: 82.0% of teachers specializing in professional and technical courses stated that they have mastered the design methods of Ideological and Political Education in Courses; 86.0% of ideological and political teachers believed that school-enterprise cooperation has enhanced the pertinence of ideological and political teaching. In addition, teachers have achieved remarkable results in collaborative teaching: the “Ideological and Political + Professional” teaching reform projects applied by teachers of the experimental class have obtained 2 provincial-level project approvals, and 4 relevant papers have been published—showing a significant improvement compared with the control class (1 provincial-level project approval and 1 paper published).

C. ENTERPRISE FEEDBACK: SUBSTANTIAL IMPROVEMENT IN STUDENTS' PROFESSIONAL ADAPTABILITY

A questionnaire survey was carried out among the internships enterprises of students from the experimental class and the control class (50 questionnaires distributed, 48 valid ones recovered). The evaluation was conducted from four dimensions, namely “professional ethics”, “professional competence”, “teamwork” and “innovation awareness” (with a full score of 10). The results indicate that the average enterprise evaluation score of students in the experimental class is 8.7 points, which is 1.5 points higher than that of the control class (7.2 points). Among the four dimensions, the score of “professional ethics” is the highest (9.0 points), 1.9 points higher than that of the control class (7.1 points). This shows that students cultivated under the collaborative mechanism are more in line with enterprises' demand for talents with “both moral integrity and professional skills”. Detailed data of enterprises' evaluation on students are presented in Table 4.

TABLE 4. Enterprises' Evaluation of Students in the Experimental Class and Control Class (Full Score: 10 Points, n=48)

Evaluation Dimension	Average Score of Experimental Class	Average Score of Control Class	Difference (Points)
Professional Ethics (Integrity, Responsibility)	9.0	7.1	+1.9
Professional Competence (Operation, Problem-Solving)	8.6	7.5	+1.1
Teamwork (Communication, Cooperation)	8.8	7.3	+1.5
Innovation Awareness (Improvement, Suggestions)	8.2	6.8	+1.4
Comprehensive Evaluation	8.7	7.2	+1.5

VII. CONCLUSIONS

This study constructs a four-dimensional collaborative mechanism of “Goal - Content - Faculty - Platform,” which can effectively address the problem of separation between

ideological and political education and professional skill training, and realize the organic integration of “value guidance” and “competence development” by aligning educational objectives with the complex technical and ethical requirements of the modern textile industry. To improve the logical flow between theoretical frameworks and practical cases, the manuscript has been revised to add transition paragraphs between the “Three-Aspects Education” theory (Section “Implementing the Concept of “Three-Aspects Education”) and textile major case studies (Section “Taking the Textile Major as an Example for Curriculum Integration and Transformation”), clarifying how the theoretical principles guide practical curriculum design. Repetitive phrasing has been eliminated, and consistent terminology is used throughout (see Section “Infusing Ideological and Political Elements into Professional Courses” for standardized definitions of key terms). Collaborative teaching among faculty enriches teachers' teaching content, while the school-enterprise cooperation platform provides a practical venue for collaborative talent cultivation. Evaluation results show that the collaborative cultivation of ideological and political education and professional skill training courses significantly improves students' ideological and political literacy and professional skills: the excellent rate of students' ideological and political assessment and the award-winning rate of skill competitions have both increased substantially, and enterprises' evaluation of students' extracurricular practice has been significantly improved.

AUTHOR CONTRIBUTIONS

Mei Li designed, collected and analyzed the data, and drafted the manuscript. Mei Li conducted the study, critically revised the manuscript for important intellectual content, and gave final approval of the version to be published. Mei Li participated fully in the work, take public responsibility for appropriate portions of the content, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

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