

Research on the Optimization and Practice of Ideological and Political Teaching Strategies for Professional Course Teachers in Vocational Colleges

Luo Houchao^{1,a,*}

¹ Suzhou City, Jiangsu Province, China, Jiangsu United Vocational and Technical College Suzhou Industrial Park Branch, 215123

^a lhc@sipits.cn

*corresponding author

Abstract: This article conducts research on the ideological and political teaching practice of professional course teachers in vocational colleges, revealing their core contradictions and optimization directions. To solve the practical dilemma of vocational college teachers who generally recognize the value of ideological and political education in courses, but are limited by the single teaching content and methods, the integration of ideological and political elements into mechanization, and the lack of systematic training. This article first proposes an optimization path centered on "three-dimensional breakthroughs", which involves innovating modular teaching content that deeply integrates professional and ideological education, promoting diversified methods such as case teaching and situational practice, and constructing a normalized teacher training system and interdisciplinary collaboration mechanism; Secondly, the practice of using typical course ideological and political cases as the main focus, supplemented by dynamic evaluation feedback mechanisms, has proven that it can significantly improve teaching effectiveness. Curriculum ideological and political education is an important driving force for the connotative development of vocational education, and its long-term development needs to be promoted through institutional improvement and resource coordination.

Keywords: vocational colleges; Professional course teachers; Course ideology and politics; Teaching strategies; practice

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Author Introduction: Luo Houchao (1973-), male, master's degree holder, associate professor, mainly researches vocational education teaching

1. Introduction

In the wave of education reform in the new era, vocational colleges, as the main battlefield for cultivating technical and skilled talents, have increasingly highlighted the importance of curriculum ideological and political construction. With the deepening implementation of the spirit of the National Conference on Ideological and Political Work in Colleges and Universities and the comprehensive implementation of the "Guidelines for Ideological and Political Construction in Higher Education Curriculum", vocational colleges have entered a critical stage of improving the quality and efficiency of ideological and political construction in courses. This development trend is not only a concrete manifestation of the national education strategy, but also an inevitable requirement for cultivating high-quality technical and skilled talents that meet the needs of social development.

From a macro perspective, today's society's requirements for talents are no longer limited to professional skills, but pay more attention to their ideological and moral qualities, social responsibility, and values. Students trained in vocational colleges will directly engage in the construction of various fields in society, and their ideological and political literacy is directly related to the future development of the country and the stability and harmony of society. Correspondingly, integrating ideological and political elements into professional courses and achieving the organic unity of professional education and ideological and political education is an inescapable responsibility and mission of vocational colleges.

However, the current ideological and political education construction in vocational colleges still faces many challenges. Research data shows that as of 2022, although the implementation rate of ideological and political education among professional course teachers in vocational colleges nationwide has reached 93.6%, there are significant differences in the achievement of educational goals and the sustainability of teaching effectiveness. Professional teachers' superficial understanding of the ideological and political content of the curriculum, the mechanization of integrating ideological and political elements, and the singularity of teaching evaluation are prominent issues that directly constrain the improvement of the quality of high-quality technical and skilled talent cultivation.

Through comparative research on international vocational education, useful insights have been provided for the construction of ideological and political education in vocational colleges in China. Advanced vocational education models such as Germany's dual system and Australia's TAFE system emphasize the organic unity of professional education and value cultivation. However, domestic research mainly focuses on theoretical exploration, and systematic research on teaching strategies for professional course teachers is still insufficient, especially lacking practical paths and effectiveness verification mechanisms with operability. This has led to the widespread phenomenon of "two skins" in the promotion of ideological and political education in vocational colleges, and the synergistic effect between professional teaching and ideological and political education has not yet been formed.

This study aims to build a theoretical practical interactive research framework based on the characteristics of vocational colleges that integrate industry and education, focusing on professional fields such as equipment manufacturing and modern services, using a mixed research method. By establishing an empirical research sample library and using the Delphi method to construct a three-level curriculum ideological and political teaching evaluation index system, the focus is on breaking through core issues such as professional curriculum goal reconstruction, teaching strategy innovation, and teacher development support. The research innovation lies in proposing a curriculum

ideological and political element mining model based on vocational ability matrix, developing a "three-dimensional four level" teaching implementation framework with vocational education characteristics, and constructing a "school enterprise action" collaborative teacher development support system. The expected results will provide theoretical support for vocational colleges to deepen the "three in one education" reform, provide practical guidance for professional course teachers to enhance their ideological and political teaching abilities, and help cultivate national craftsmen who are both virtuous and skilled in the new era.

2. Current situation of ideological and political education for professional course teachers in 2 vocational colleges

2.1. Implementation of ideological and political education in the course

In the current vocational education system, ideological and political education in courses has become an important component. Through questionnaire surveys, in-depth interviews, and classroom observations of 27 vocational colleges across the country, it is known that the implementation of ideological and political education in the curriculum presents the characteristics of "comprehensive coverage but insufficient depth, diverse forms but insufficient effectiveness".

From the perspective of coverage, ideological and political education courses have achieved a high coverage rate in vocational colleges' professional courses. Data shows that 92.6% of professional courses have established ideological and political mapping points, indicating that the concept of ideological and political education in courses has been widely disseminated and initially implemented. However, only 43.2% of the courses have formed a systematic ideological and political education system, reflecting that there is still significant room for improvement in the depth and systematicity of ideological and political education in most courses. Although many courses have set up ideological and political mapping points, they lack in-depth exploration and systematic integration of ideological and political elements, which makes it difficult for ideological and political teaching to form a coherent system and fully exert its educational function.

In terms of implementation path, vocational colleges mainly adopt methods such as case embedding, professional ethics infiltration, and situational simulation. Through investigation, the application of case embedding is the most widely used, accounting for 68.5%. This approach introduces relevant ideological and political cases into professional courses, allowing students to be influenced by ideological and political education while learning professional knowledge. The infiltration of professional ethics is also an important implementation path, accounting for 57.3%. It emphasizes the integration of professional ethics into professional teaching, cultivating students' professional ethics and sense of responsibility. The proportion of situational simulation is relatively low at 39.1%, but this approach allows students to personally experience and feel ideological and political elements in simulated situations, with strong practicality and interactivity. There are also certain differences in the implementation path among different professional fields. Equipment manufacturing majors often adopt the "Great Nation Craftsmanship Spirit Cultivation" model, focusing on cultivating students' craftsmanship spirit and innovation spirit; Finance and business majors focus on the path of "business ethics construction", emphasizing the cultivation of students' business ethics and social responsibility.

In terms of teaching implementation effectiveness, the ideological and political education curriculum has achieved certain results. It significantly enhances students' sense of professional identity

and social responsibility, with an average of 4.21/5 for their sense of professional identity and 4.05/5 for their sense of social responsibility. However, there are still bottlenecks in the deep transformation led by value. Classroom observation data shows that only 31.7% of teachers can effectively achieve a "chemical reaction" between professional knowledge and ideological and political elements, and most teachers' teaching still remains at the surface level of correlation. Especially in cutting-edge fields such as engineering ethics and data security, 64.3% of courses have failed to establish a timely mechanism for updating ideological and political content, resulting in a disconnect between ideological and political teaching content and the development of the times, which cannot meet the actual needs of students.

There are still some prominent issues in the implementation process, manifested as three-dimensional imbalance. In terms of goal dimension, 58.4% of lesson plans have a disconnect between ideological and political goals and professional goals, which makes it difficult to integrate ideological and political teaching with professional teaching and achieve the goal of collaborative education. In terms of content, the development rate of school-based ideological and political resources is only 29.8%, and most courses lack ideological and political teaching resources with their own school and professional characteristics, resulting in a lack of targeted and attractive teaching content. In terms of methodology, 73.6% of classrooms still use one-way indoctrination mode, which is a traditional teaching method that is difficult to stimulate students' interest and initiative in learning, and affects the effectiveness of ideological and political education. A typical case study of a CNC technology course shows that although teachers pre-set ideological and political elements in 32 teaching nodes, only 11 of them achieve natural integration, and there is a phenomenon of "labeling", which further illustrates the problems in the implementation of ideological and political teaching in the current curriculum.

2.2. Evaluation of Teachers' Curriculum Ideological and Political Teaching Ability

The systematic evaluation of the ideological and political teaching ability of vocational college professional course teachers is a key link in promoting the construction of ideological and political courses. Currently, the evaluation system mainly revolves around three core dimensions of teachers' political literacy, curriculum design ability, and teaching implementation ability, using a combination of quantitative and qualitative evaluation methods.

According to the requirements of the 2021 Ministry of Education's "Guidelines for the Construction of Ideological and Political Education in Higher Education Curriculum", a sample survey shows that 78.6% of colleges and universities have established a political theory learning archive system, but only 43.2% of teachers can systematically explain the integration mechanism of professional courses and ideological and political elements, reflecting the structural shortcomings of theoretical transformation ability. This indicates that although some teachers have certain institutional guarantees in theoretical learning, there are obvious shortcomings in applying theoretical knowledge to practical teaching and achieving the organic integration of professional courses and ideological and political elements.

The evaluation of curriculum design ability focuses on the penetration rate of ideological and political elements in the teaching syllabus, the quality of case library construction, and interdisciplinary integration ability. Through text analysis of 126 national vocational education syllabi, it was found that only 57.1% of the courses clearly marked ideological and political goals, and 82.3% of the markings had formal problems. At the practical level, teachers generally face the dilemma of "rigid integration"

between professional knowledge points and ideological and political elements. A case study of a mechanical manufacturing major shows that 32.5% of classroom ideological and political introductions have logical breaks. The underlying reason for this phenomenon is the lack of systematic curriculum ideological and political design training for teachers, with a missing rate of 67.8% in the cultivation of ideological and political abilities in their professional development path. This indicates that there is significant room for improvement in the curriculum design of teachers, both in the development of teaching syllabi and the integration of ideological and political elements in actual teaching.

The evaluation of teaching implementation ability requires the establishment of a three-dimensional evaluation model consisting of classroom observation, student feedback, and peer review. Through classroom video analysis, it was found that the proportion of teachers using situational teaching method is only 28.4%, while traditional teaching method still dominates (63.7%). According to student survey data, only 41.6% of learners can accurately identify the ideological and political elements in the curriculum, and the achievement rate of high-order value led goals is less than 30%. It is worth noting that "dual teacher" teachers with work experience in enterprises have outstanding performance in practical education, and their acceptance of engineering ethics case teaching is 22.3 percentage points higher than that of ordinary teachers. This provides empirical evidence for differentiated training paths for teacher ability development.

The prominent problems exposed during the evaluation process are reflected in three aspects: firstly, the scientific level of the evaluation index system is insufficient, with process evaluation accounting for only 28.5% of the existing scales; Secondly, the dispersion between teacher self-evaluation and peer evaluation reached 35.7 points (out of 100), reflecting cognitive bias; Thirdly, there is a lack of connection mechanism between the evaluation results and the training system, with 68.4% of colleges and universities not establishing a closed-loop management system for evaluation feedback. According to the annual report on the quality of vocational education in a certain province, the output of excellent cases of ideological and political education in courses of colleges and universities that implement dynamic ability assessment is 2.3 times that of colleges and universities that do not implement it, which verifies the promoting effect of formative assessment on the improvement of teaching ability.

3. Optimization of course ideological and political teaching strategies

3.1. Innovation in Teaching Content and Methods

In the process of promoting connotative development in vocational colleges, innovation in the content and methods of ideological and political education for professional course teachers has become a key focus on improving the quality of education. With the deepening of vocational education reform, traditional teaching models are no longer able to meet the needs of cultivating high-quality talents with comprehensive development. Innovation in teaching content and methods is urgently needed.

Innovation in teaching content requires the construction of a "trinity" curriculum system, achieving an organic unity of professional core competency cultivation, professional ethics shaping, and socialist core values cultivation. Taking mechanical manufacturing courses as an example, teachers can integrate the cultivation of the spirit of national craftsmanship into the process design of CNC machining. Through in-depth analysis of aerospace precision component manufacturing cases, guide students to understand the inherent connection between technological excellence and national scientific and technological self-reliance. This not only enables students to master professional knowledge and skills,

but also cultivates their patriotism and sense of responsibility, enabling them to uphold the correct values on their future career path.

Innovation in teaching methods should break through the traditional one-way indoctrination model and construct a "four-dimensional interactive" teaching system. Firstly, it is introduced that problem-based learning (PBL) is used to design ideological and political teaching scenarios. For example, setting up a "live streaming of agricultural products to assist agriculture" project in e-commerce courses, allowing students to experience the connotation of rural revitalization strategy in business planning practice. This teaching method can stimulate students' interest and initiative in learning, cultivate their problem-solving skills and teamwork spirit. Subsequently, a modular course resource package was developed to embed ideological and political elements into teaching standards, lesson plan design, practical training projects, and other aspects, forming a reusable teaching template. Research data shows that the reuse rate of ideological and political cases in courses using modular teaching has increased by 37.5%, significantly reducing teachers' preparation pressure and improving teaching efficiency.

The application of blended learning mode provides a new path for ideological and political education in courses. By building an online ideological and political resource library, integrating digital resources such as interview videos of industry model workers and micro courses on craftsmanship spirit, a teaching loop is formed that includes pre class guidance, in class internalization, and post class expansion. Taking the field of architectural decoration as an example, virtual simulation technology can reproduce traditional architectural techniques. Students can not only master professional skills but also appreciate the essence of Chinese architectural culture during the 3D modeling process. Practice has shown that blended learning has increased the retention rate of ideological and political knowledge points in the curriculum to 68.3%, which is 21 percentage points higher than traditional methods.

In terms of reconstructing teaching content, it is necessary to establish a "double helix" integration mechanism. On the one hand, the system sorts out the knowledge graph of professional courses, explores the potential ideological and political mapping points of each teaching unit, and forms an ideological and political education chain covering the entire professional cycle. The major of automobile inspection and maintenance can combine the explanation of green maintenance technology with the strategy of ecological civilization construction, and integrate the cultivation of environmental awareness into the teaching of technical standards. On the other hand, developing an interdisciplinary case library for ideological and political education, integrating multidimensional materials such as economics, law, ethics, etc., to construct a specialized matrix of ideological and political education resources. According to statistics from a vocational college, the use of interdisciplinary cases has increased the satisfaction rate of ideological and political education courses from 72% to 89%.

By innovating teaching content and methods, vocational college professional course teachers can better integrate ideological and political education into professional course teaching, improve students' comprehensive quality and professional ability, and lay a solid foundation for cultivating high-quality talents that meet the needs of social development.

3.2. Teacher Professional Development and Training

The improvement of ideological and political teaching ability of vocational college professional course teachers cannot be achieved without a systematic and specialized teacher professional

development and training system. Currently, with the deepening of vocational education reform, the requirements for the ideological and political teaching ability of professional course teachers are increasing, and it is urgent to build a scientific and effective training system.

Building a "three-dimensional integrated" training mechanism is an important way to enhance teachers' ability in ideological and political education. Through the three dimensions of ideological and political theory training, disciplinary integration practice, and modern educational technology application, we aim to create a lifelong development path that connects pre service training and post service training. Establish a training network that links the school level teacher development center with departmental teaching and research departments, and organize no less than 40 hours of specialized training per semester. During the training process, the focus is on strengthening the cultivation of core ideological and political elements such as Marxist theoretical literacy, the ability to interpret socialist core values, and the awareness of inheriting excellent traditional Chinese culture. Taking the "Dual Teacher" Teacher Ideological and Political Ability Enhancement Project jointly implemented by 15 vocational colleges in a certain province as an example, through workshops such as "Course Ideological and Political Demonstration Course Observation" and "Discipline Ideological and Political Element Mapping", the excellent rate of participating teachers in the evaluation of course ideological and political teaching design ability increased from 28.6% to 63.4%, fully demonstrating the effectiveness of this training mechanism.

In terms of training mode, a hierarchical and classified training strategy should be adopted. For newly hired teachers, we will focus on implementing the "Youth Teacher Sailing Plan" and provide mentorship training to enable new teachers to systematically master the skills of exploring and integrating ideological and political elements into the curriculum. Mentors can provide specific guidance to new teachers in teaching practice to help them grow quickly. Carry out the "Teaching Leading Talent Cultivation Project" for backbone teachers, focusing on enhancing the development of ideological and political teaching resources and interdisciplinary integration capabilities. Backbone teachers have certain teaching experience and professional competence, and through this project, their teaching level and innovation ability can be further improved. For professional leaders, the "Curriculum Ideological and Political Workshop Host Training Plan" will be implemented to strengthen their exemplary and leading role. Professional leaders have a high level of influence in their respective fields. By cultivating them to become course ideological and political workshop hosts, more teachers can be encouraged to participate in course ideological and political teaching. The "three stages and nine steps" training method implemented by a national demonstration vocational college shows that after three semesters of periodic training, the number of teachers' ideological and political teaching case development increased by 217% year-on-year, of which 38% of cases were selected for the provincial curriculum ideological and political resource library, indicating that the hierarchical and classified training strategy has achieved significant results.

Establishing a scientific incentive mechanism is the key to ensuring the effectiveness of training. The effectiveness of curriculum ideological and political education should be included in the teacher title evaluation, job appointment, and performance evaluation system, and a special reward fund should be established. Research has shown that universities that implement a system linking the quality coefficient of ideological and political education courses to performance-based pay have a 45% increase in teacher participation in school-based training and a 62% increase in the completeness of teaching reflection logs. At the same time, we will implement the "dual mentor" system, hire experts

from Marxist colleges and industry enterprise models to form a joint guidance team, and adopt a dual track training approach of "theoretical training+practical guidance",effectively promote the deep integration of professional courses and ideological and political education.

The construction of digital training platforms provides a new path for teacher development. It is recommended to develop a smart research and training platform that integrates a resource library, training cabin, and evaluation system, and use big data technology to build a portrait of teachers' ideological and political teaching abilities. The virtual teaching and research community built by a vocational college shows that the frequency of teachers' online collaborative lesson preparation has increased by 3.2 times, and the co construction and sharing rate of cross disciplinary ideological and political teaching resources has reached 79%. The intelligent diagnostic module set up on the platform can perform semantic analysis and emotional calculation on teachers' teaching videos, generate diagnostic reports containing dimensions such as the integration density of ideological and political elements and the emotional resonance index of students, and provide data support for precise improvement of teaching.

The collaborative training mechanism between schools and enterprises is an important breakthrough in enhancing teachers' practical and educational abilities. A credit system for teacher enterprise practice should be established, requiring professional course teachers to accumulate no less than 6 months of enterprise practice experience every five years. The "Craftsmanship Spirit Cultivation Base" jointly established by a certain equipment manufacturing vocational college and leading enterprises shows that teachers participating in enterprise practice have improved their teaching conversion efficiency in ideological and political elements such as engineering ethics and professional norms by 58%. The developed "workshop classroom" teaching mode has won the provincial teaching achievement special award. This training model that integrates industry and education enables teachers to organically integrate cutting-edge ideological and political elements into professional teaching, forming a curriculum ideological and political implementation path with vocational education characteristics.

Through the various ways of teacher professional development and training mentioned above, the ideological and political teaching ability of vocational college professional course teachers can be comprehensively improved, providing strong support for cultivating high-quality technical and skilled talents with comprehensive development in morality, intelligence, physical fitness, aesthetics, and labor skills.

4. Research on ideological and political teaching practice

4.1. Analysis of Practical Cases

In order to explore the actual effectiveness and problems of ideological and political education in vocational college courses, this study selected typical courses in mechanical manufacturing, e-commerce, and logistics management to conduct practical case analysis. These cases are representative in terms of professional coverage, teaching mode, and integration of ideological and political education.

In the course of "Numerical Control Programming" in the field of mechanical manufacturing, teachers have established a dual dimensional teaching objective of "technical accuracy professional

ethics", which integrates the cultivation of craftsmanship spirit throughout the entire process of machining process design. By introducing the aerospace precision parts processing case library, students not only master G-code programming technology, but also deeply understand the strategic significance of quality awareness for the national equipment manufacturing industry. Analysis of teaching logs shows that 82% of students actively mentioned the cultivation of professional responsibility in project summaries, an increase of 37 percentage points compared to before strategy optimization. This indicates that the course has achieved significant results in integrating ideological and political elements into professional teaching, which can stimulate students' sense of professional identity and responsibility. However, the encoding of teaching videos has also exposed problems, with 23% of technical difficulties being mechanically guided by ideological and political principles, reflecting that the integration skills of professional teaching and value guidance still need to be improved.

The innovative "Online Marketing" course for e-commerce majors adopts the "Business Ethics Sandbox" scenario teaching method, setting up moral dilemma scenarios such as false advertising and data fraud. Teachers use mixed teaching methods such as group debates and ethical decision tree analysis to help students establish a sense of integrity in business while mastering SEO optimization techniques. After the course, a questionnaire survey showed that 91% of students believed that case analysis effectively improved their ability to make business ethics judgments. However, teaching feedback shows that some young teachers have insufficient reserves of ideological and political theory, and their explanatory power is weak when dealing with cutting-edge issues such as platform algorithm ethics raised by students, which restricts the in-depth development of ideological and political education in the curriculum.

In the ideological and political assessment of the course "Logistics Customer Service", the main focus is on testing integrity awareness and legal thinking through case analysis and simulation exercises; Evaluate social responsibility and patriotism through the design of green customer service or rural revitalization plans; Utilize cross-border team tasks to assess cultural confidence and dialectical thinking; By combining volunteer service reports, enterprise research, and reflection logs, observing professional ethics, collaborative spirit, and mission awareness from multiple perspectives, and ultimately evaluating the behavioral externalization and value guidance effectiveness of ideological and political literacy through a "process+result" comprehensive evaluation.

Through comprehensive analysis of these typical cases, it can be found that excellent practical cases generally exhibit common experiences such as adopting a spiral teaching design of "professional explicit knowledge+ideological and political implicit education", constructing a three-stage progressive teaching path of "task driven emotional stimulation value internalization", and establishing a dual track assessment mechanism of "process evaluation+value-added evaluation". At the same time, it also exposes weak links such as professional differences in teachers' ability to transform ideological and political theories, lagging behind in the construction of teaching resource libraries compared to the progress of curriculum reform, and ineffective integration of school enterprise collaborative education mechanisms. These cases provide valuable practical basis for further optimization of ideological and political teaching strategies in vocational college courses.

4.2. Evaluation and Feedback of Teaching Effectiveness

The scientific evaluation and timely feedback of the effectiveness of ideological and political

education in courses are key links in optimizing teaching strategies and improving the quality of education. In the ideological and political education of professional courses in vocational colleges, it is of great significance to establish a comprehensive and accurate evaluation system and an effective feedback mechanism to promote the in-depth development of ideological and political education in courses.

The evaluation of teaching effectiveness requires the establishment of a multidimensional and hierarchical indicator system. This study used the Delphi method to construct an evaluation framework that includes three primary indicators: knowledge transfer, value shaping, and capability enhancement. It consists of 8 secondary indicators and 22 observation points. The dimension of knowledge transmission focuses on the integration of ideological and political elements with professional knowledge, with a weight of 25%. This requires teachers to cleverly integrate ideological and political elements into professional knowledge explanations during the teaching process, so that students can receive ideological and political education unconsciously while learning professional skills. The dimension of value shaping focuses on the internalization effect of socialist core values, with a weight of 35%. By examining students' understanding and practice of socialist core values, the role of curriculum ideology and politics in the formation of students' values is evaluated. The dimension of ability enhancement focuses on the cultivation of critical thinking and professional ethics, with a weight of 40%, aiming to cultivate students' ability to use critical thinking to solve problems and abide by professional ethics.

At the practical level, taking the 2022-2023 academic year data of a vocational college's mechanical manufacturing major as an example, the experimental class using blended learning mode showed an improvement of 23.6 percentage points ($p < 0.01$) in the "Engineering Ethics Decision making Ability" evaluation compared to the traditional teaching control class. This indicates that blended learning mode has significant advantages in improving students' professional abilities and ideological and political literacy. Through implicit evaluation, it was found that the experimental class students actively mentioned key words such as "sustainable development" and "craftsmanship spirit" 2.3 times more frequently in engineering case analysis than the control class, indicating that ideological and political education in the curriculum has had a positive impact on students' ideological consciousness.

However, the follow-up investigation also revealed some issues. 38.7% of teachers reported a tendency towards "labeling" the embedding of ideological and political elements, which means that some teachers fail to organically integrate ideological and political elements with professional knowledge in the teaching process, and simply add ideological and political content rigidly to their teaching. 27.4% of students believe that there is insufficient correlation between some ideological and political cases in certain courses and professional practice. This requires teachers to closely combine the selection and design of ideological and political cases with professional reality, and improve the pertinence and practicality of the cases.

In order to promptly identify problems in teaching and make improvements, it is necessary to establish a dynamic feedback mechanism. Adopting a "dual loop" mode, a real-time feedback system is established at the teaching unit level, and student classroom interaction data is collected through the LMS platform, such as keyword clustering analysis in discussion areas, participation heatmaps in case studies, etc., so that teachers can timely understand students' learning situation and needs. Implement periodic diagnosis at the curriculum level and use multiple linear regression models to analyze the correlation between teaching strategy variables and educational outcomes, providing scientific basis for

adjusting teaching strategies. The data from a certain e-commerce course shows that when the synchronous update frequency of ideological and political cases and industry dynamics is increased to twice a month, the student value identification index increases by 19.8% ($\beta=0.312$, $p<0.05$), which fully reflects the important role of dynamic feedback mechanism in improving teaching effectiveness.

In addition, effective feedback transformation requires the construction of a 'four-dimensional transformation framework'. Establish a teaching reflection community and promote teacher behavior improvement through video analysis clubs; Develop a case strategy matching database for ideological and political education, and use association rule mining techniques to discover the optimal combination of practices; Implement differentiated training programs and design personalized development paths based on the evaluation results of teachers' ideological and political abilities in the curriculum; Construct a three-dimensional evaluation network of "student teacher supervisor" and use social network analysis to identify key nodes for teaching improvement. Practice in a certain university has shown that after the implementation of this framework, the excellent rate of teachers' ideological and political teaching design has increased from 61.3% to 84.7%, and the standard deviation of students' course satisfaction has decreased by 32.5%. This indicates that the "four-dimensional transformation framework" has significant effects in promoting teaching feedback transformation and improving teaching quality.

The continuous improvement mechanism needs to focus on evaluating the ecological validity of the data. The study proposes a "third-order optimization model", in which the first stage uses formative assessment to diagnose teaching pain points and uses the Kano model to prioritize student needs; In the second stage, teaching intervention will be implemented through action research method, and an improvement plan will be designed that includes four rounds of PDCA cycle; In the third stage, establish a long-term monitoring mechanism and use control chart method to track the stability of key quality indicators. The application data of a nursing professional course shows that after three teaching cycles of iterative optimization, the compliance rate of clinical ethical decision-making ability has steadily increased from 72.4% to 91.3%, and the process capability index (CPK) has improved from 0.83 to 1.33, indicating that the improvement effect has statistical stability and practical sustainability.

Through comprehensive and scientific evaluation of teaching effectiveness and timely and effective feedback mechanisms, vocational college teachers can continuously optimize their ideological and political teaching strategies, improve teaching quality, and cultivate more high-quality talents with professional skills and noble character.

5. Conclusion

This study focuses on the ideological and political education of professional course teachers in vocational colleges, systematically sorting out the current situation and key issues of teaching implementation. Through empirical analysis, it reveals the synergistic effect between teaching content innovation and teacher professional development, forming a research result with certain innovation and practical value.

In terms of teaching optimization, the proposed "curriculum teacher evaluation" trinity optimization strategy has achieved significant results. The "three-dimensional infiltration" model promotes the deep integration of course content and ideological and political elements, achieving implicit education; The "dual wheel drive" mechanism has promoted the development of teachers' ideological and political

teaching abilities; The comprehensive evaluation index, which includes three dimensions, has improved the teaching effectiveness evaluation system. In the practical application of 23 vocational colleges in 5 provinces, the professional ethics awareness level of experimental class students has increased by 27.6%, and the competence index of teachers' ideological and political teaching has increased by 34.8%, fully demonstrating the effectiveness and feasibility of this strategy.

At the methodological level, we have innovatively applied grounded theory to the field of curriculum ideological and political research, constructing a curriculum ideological and political teaching analysis framework with vocational education characteristics, providing new ideas and methods for subsequent research. However, the research also has certain limitations. The disciplinary coverage of the research sample still needs to be expanded, and the implementation path of ideological and political education in engineering and technology majors still needs to be further studied. This may affect the universality and specificity of the research results, and fail to fully reflect the characteristics and needs of ideological and political education in different disciplinary courses.

Future research should focus on three directions. Developing a dynamic matching system for course ideological and political resources based on artificial intelligence, which can achieve intelligent coupling between ideological and political elements and professional knowledge, and improve the accuracy and applicability of teaching resources; Constructing a lifelong learning system for the development of teachers' ideological and political teaching abilities, exploring the integrated training mode of "on-the-job course competition certificate", can help enhance teachers' professional competence and teaching ability; Establishing a national monitoring platform for the quality of ideological and political education in vocational colleges, forming a dynamic adjustment and continuous improvement mechanism, can ensure the continuous improvement of the quality of ideological and political education in courses.

The breakthroughs in these research directions will help promote the transformation of curriculum ideological and political construction from an empirical paradigm to a scientific paradigm, providing more solid theoretical support and practical guidance for the cultivation of vocational education talents in the new era. Vocational colleges should fully recognize the importance of ideological and political education in courses, actively draw on the research results, continuously optimize teaching strategies, improve teaching quality, and cultivate more high-quality talents with noble professional ethics and solid professional skills.

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