Article

Exploring a Competition-Oriented Mechanism for Integrating Moral and Technical Education in Higher Vocational Colleges

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Abstract: In the context of higher vocational education, counselors are not only responsible for student management and psychological support but also play a pivotal role in integrating innovation and entrepreneurship education with ideological and political education (IPE). Guided by a "competition-driven" approach, this study investigates how counselors can effectively embed IPE into students' innovation and entrepreneurship practices by constructing a tripartite integration mechanism of project orientation, collaborative education, and value guidance. Using the "Pipeline Inspection Robot" project as a case study, the paper explores the counselor's educational practices in various stages, including team formation, value shaping, competition management, and achievement transformation. Findings suggest that competition-based practice provides authentic scenarios and deep engagement platforms for IPE, effectively enhancing students' sense of responsibility, teamwork spirit, and professional ideals. The paper further proposes strategies such as improving institutional support, optimizing curriculum integration, and strengthening cross-functional collaboration, offering practical insights for advancing the deep integration of ideological and political education with innovation and entrepreneurship training in vocational colleges.

Keywords: innovation and entrepreneurship; ideological and political education; competition-based education

1. Introduction

At present, China's higher vocational education is undergoing a strategic transition from "scale expansion" to "quality improvement." With the continued advancement of the new industrial revolution and the national "mass entrepreneurship and innovation" strategy, the demand for skilled technical talents has shifted from merely being "able to do" to being "able to think, innovate, and take responsibility." Against this backdrop, cultivating high-quality technical talents who possess both strong professional competencies and sound ideological and political literacy has become a central mission of vocational education [1,2].

The Action Plan for Improving the Quality of Vocational Education (2020–2023) clearly states the need to promote the integration of moral and technical education through a work-integrated learning approach, embedding ideological and political education throughout the entire talent training process [3]. Similarly, the Opinions on Deepening the Reform and Innovation of Ideological and Political Theory Courses in the New Era emphasize building an educational framework characterized by "all staff, whole process, and all-round involvement," breaking down the barriers between ideological-political education and professional education to achieve synergy and unified direction[4,5]. These policy guidelines provide both institutional support and theoretical grounding for vocational colleges to integrate ideological and political education into professional practice and innovation activities.

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In this context, counselors—often referred to as the "frontline force" of ideological and political work in colleges—are transforming from traditional student managers into multi-dimensional educators engaged throughout the student development process. Within the increasingly dynamic arena of competition-based education, counselors are no longer merely organizers or supervisors; they are evolving into mentors, planners, and value guides in students' personal and professional journeys. Counselors are now expected to support not only students' growth in technical skills and innovative capacity but also to infuse competition practices with education in ideals and beliefs, professional ethics, and social responsibility.

Especially as innovation and entrepreneurship competitions become increasingly integrated into professional curricula, practical training, and community service, these activities serve as crucial bridges linking classroom learning, engineering application, and social value. How to fully leverage counselors' educational roles in such competitions—thereby building an integrated mechanism that combines competition-based learning with ideological-political guidance—not only affects students' overall competence development but also determines the effectiveness of the "all-round education" strategy in higher vocational institutions. Therefore, a systematic exploration of how counselors can facilitate the integration of moral and technical education under the context of competition is both practically significant and theoretically valuable.

2. Challenges in Ideological and Political Education Driven by Competitions

Under the ongoing promotion of integrated talent cultivation involving "posts, courses, competitions, and certifications" in higher vocational education, competitions have become a crucial platform that highly integrates practice, teamwork, and outcome orientation, serving as an important means for colleges to improve students' comprehensive qualities [6]. However, in practice, the integration of ideological and political education (IPE) with competition activities still faces numerous practical difficulties that require urgent attention and resolution.

2.1. The Weakening of the Moral Education Function in Competition-Based Education

While the consensus on "promoting teaching and learning through competitions" has been widely embraced by institutions, some colleges or project teams tend to oversimplify competition orientation as merely "result-oriented" or "honor-oriented." This leads to an excessive emphasis on technical indicators, award levels, and commercial potential of projects, causing the educational function of competitions to become "skill-focused but neglecting morality." During preparation, students are often guided to focus on technical breakthroughs, presentation effects, and defense performance, while neglecting educational dimensions such as the social value, ethical norms, and professional responsibilities behind the projects [7]. For example, project designs may lack sustainability considerations, ignore user safety, or overlook social impacts, revealing a deficiency in moral education. Additionally, some instructors and team managers themselves lack effective methods for integrating ideological and political guidance into competitions, further weakening the effectiveness of moral education.

2.2. Lack of Institutional Support for the Role of Counselors

Although "all-staff education" has become a fundamental requirement for ideological and political work in vocational colleges, counselors' roles in innovation and entrepreneurship competitions have yet to be fully recognized and institutionalized in practice [8]. This is reflected in several aspects:

Unclear role definition: Counselors mainly undertake peripheral coordination and daily student management in most competition projects, lacking deep involvement in substantive project content.

Absence of participation mechanisms: Counselors are often marginalized in key processes such as project initiation, team formation, expert evaluation, and fund allocation, making it difficult for them to engage in whole-process education.

Insufficient incentives: Some institutions lack clear recognition of counselors' contributions to competition-based education in performance assessments and professional title evaluations, undermining their motivation and initiative.

Consequently, counselors, who should play critical roles in ideological guidance, psychological support, and value education, are relegated to "logistical support" roles, making it difficult to realize their full-chain participation in competition-based education.

2.3. Lack of Practice-Based Support in Ideological and Political Education Content

Currently, traditional ideological and political education mainly relies on concentrated lectures, thematic seminars, and political theory study, which tend to be abstract and presented in a relatively monotonous manner, lacking authentic guidance that connects with students' interests and practical contexts. Under such conditions, students often perceive ideological courses as "theoretical formalities" disconnected from real values, significantly reducing educational effectiveness.

In stark contrast, innovation and entrepreneurship competitions are closely aligned with technical applications, industry demands, and social development, serving as natural "real-world classrooms" for ideological and political education. However, many colleges have not fully explored the ideological education resources embedded in competition projects, such as patriotism, social responsibility, teamwork spirit, and professional ethics, resulting in a disconnect between "projects as projects" and "ideological education as ideological education."

Therefore, embedding ideological and political education content into competition projects in an "integrated" manner—through project guidance, scenario-based education, role modeling, and other approaches—is key to bridging the gap between abstract theory and concrete practice, and addressing the current challenges of disconnected education.

3. Exploration of the Integration Path: The "Competition—Project—Ideological and Political Education" Tripartite Mechanism

Faced with the persistent disconnect between ideological and political education and innovation and entrepreneurship practice in higher vocational colleges, there is an urgent need to construct a systematic, scenario-based, and continuous educational pathway. Based on prior practical explorations, this study proposes a tripartite integration mechanism of "competition—project—ideological and political education," aiming to achieve a shift from "skill cultivation" to "moral cultivation" through three dimensions: value introduction, process intervention, and outcome evaluation.

3.1. Establishing a Mechanism to Extract Ideological and Political Values from Competition Projects

Competition projects are not only technical training processes but also important carriers for value cultivation. Therefore, value guidance should be strengthened at the project initiation stage by deeply exploring ideological and political education elements centered on national development strategies, industry missions, and social issues. For example:

Guidance based on national strategies: Directions such as intelligent manufacturing, green low-carbon development, new energy, and new infrastructure can align with national strategies like "Building a Strong Science and Technology Nation" and "Digital China," guiding students to enhance their sense of responsibility for the times.

Focus on industry demands and social challenges: Students should be guided to address real societal needs such as aging populations, urban safety, and environmental pollution, experiencing the professional value of "technology for good" through problem-solving.

Embedding educational elements in project documentation: Sections on "social value" and "ethical considerations" should be set in project proposals, task documents, and presentation materials to encourage students to consciously reflect on the social significance and moral responsibilities underlying their designs.

Taking the "Pipeline Inspection Robot" project as an example, under counselors' guidance, students not only focused on technical issues such as detection algorithms and endurance design but also conducted research and analysis on topics like aging urban infrastructure and underground space safety, thereby enhancing public service awareness and engineering ethics thinking.

3.2. Constructing a Mechanism for Deep Counselor Involvement

As the main force of ideological and political education, counselors should no longer be limited to student management and organizational services but should be deeply embedded throughout the entire competition process, assuming educational responsibilities across the "project—process—outcome" cycle.

Counselors should be formally assigned a "dual identity" as both "Ideological and Political Mentors" and "Project Growth Advisors," undertaking the following responsibilities in competition activities:

Pre-project stage: Assist in guiding team selection, conduct value-oriented thematic class meetings, and guide students to establish correct competition motivation and team awareness;

Implementation stage: Participate in phase assessments, provide training on teamwork and professional ethics addressing technical challenges, and promptly intervene in students' psychological adjustment and emotional management;

Outcome presentation stage: Organize mock defenses and explain the social significance of projects to strengthen students' public expression, value dissemination, and social recognition;

Summary and reflection stage: Organize team "post-mortem" meetings to review growth and achievements, explore individual potential, and help students form rational career plans. Through institutional arrangements, counselors should be included in project kickoff meetings, progress reports, and outcome evaluations, integrating them into project-based educational evaluation systems to truly achieve "whole-process, all-round, and all-staff education."

3.3. Implementing a Process-Oriented Educational Evaluation Mechanism

Traditional evaluations of ideological and political education often rely on theoretical exams or phase summaries, which inadequately reflect changes in students' values, sense of responsibility, and teamwork ability during competition practices. Therefore, it is necessary to establish an evaluation mechanism combining "process participation + behavioral tracking + subjective reflection", shifting assessment from "result-oriented" to "development-oriented."

Recommended measures include: Project log system: Encourage students to regularly write "growth logs" documenting technical progress, teamwork, and ideological insights, which counselors review and provide feedback on, guiding self-awareness and reflection; Periodic interview mechanism: Conduct one-on-one or group interviews to understand students' psychological states, value judgments, and professional identities during projects, enabling dynamic guidance; Embedding value reflection in competition review and presentation: Incorporate "social significance statements" in project roadshows or final presentations, encouraging students to articulate project value from perspectives such as technology serving society, ethical risks, and team responsibility; Diversified behavioral performance evaluation: Holistically assess students' collaboration, resilience, public speaking, and professionalism, integrating counselor observations and team feedback to form a dual-feedback system emphasizing both skills and ideology.

This mechanism can promote continuous internalization of ideological and political education through practice, shifting from "being required to cultivate morality" to "actively cultivating morality," thereby realizing effective, contextualized, and personalized ideological education.

4. Practical Case Study: Ideological and Political Education Practice in the "Pipeline Inspection Robot" Project

This study selects the "Pipeline Inspection Robot" project as a representative case to demonstrate the practical path and educational effectiveness of the integrated "competition—project—ideological and political education" mechanism. Originating from the real needs of urban pipeline maintenance and public safety, the project was independently initiated by mechanical engineering students from a vocational college. It focused on core tasks such as robot chassis design, control system programming, and image recognition module development. The project has participated in multiple innovation and entrepreneurship competitions, such as the "Challenge Cup" and "Internet+," winning provincial-level awards and demonstrating both technical depth and social value.

Throughout the entire project cycle, counselors played a key role in ideological and political education, participating deeply from team formation to final project review, facilitating the natural integration of ideological elements at each stage. During the team formation phase, the counselor assisted in selecting core members, helping students clarify roles and build a technically complementary team structure. At the same time, themed class meetings were organized to cultivate students' sense of responsibility and collective identity. In the project implementation phase, the counselor conducted regular progress checks, facilitated team communication, and organized thematic discussions on technical ethics and professional spirit. These activities helped students manage pressure, resolve conflicts, and enhance resilience and professionalism.

During the project presentation phase, the counselor worked alongside academic mentors to guide students in refining their project defense and presentation materials. Particular emphasis was placed on expressing the social significance of project outcomes and whether the product delivered real service value, thereby strengthening students' sense of social responsibility and awareness of technology for public good. In the project conclusion phase, the counselor organized a post-project review meeting with the team to analyze lessons learned and achievements. Students were encouraged to extend the project into entrepreneurial incubation and were guided in planning their career development, inspiring long-term aspirations. Throughout this project, students not only demonstrated significant improvements in technical skills but also gradually developed a positive value orientation and a strong sense of social responsibility through the competition experience.

After the project concluded, the counseling team conducted a questionnaire survey and in-depth interviews with the participating students. The results revealed that over 80% of students stated they realized the importance of teamwork and social responsibility during the competition and believed that the experience enhanced their communication, problem-solving, and professional judgment skills. Approximately 40% of students expressed entrepreneurial intentions or applied to participate in higher-level national competitions as a result of the project. Some technical outputs from the project were also accepted by the campus innovation and entrepreneurship incubation platform, submitted for patents, and received angel-round pitch recommendations—demonstrating the potential transformation of a "student competition project" into a real-world technological product.

This case fully illustrates that under the competition-driven model, if counselors engage in a full-process, embedded manner and combine ideological education with real-world problem-solving, it not only improves students' ideological and political literacy but also fosters their professional identity and sense of social responsibility. It provides

valuable practical reference for vocational colleges aiming to achieve the educational goal of integrating moral and technical development.

5. Recommendations

In response to the current challenges facing ideological and political education (IPE) under the competition-driven model, and based on practical experience from the Pipeline Inspection Robot project, this paper proposes the following strategies to promote high-quality integration of "competition-driven moral education" in vocational colleges.

5.1. Improve the Institutional Mechanism for Counselor Participatio

At present, the responsibilities of counselors in competition-based education remain ambiguous, resulting in limited involvement and minimal impact. To enhance educational effectiveness, institutions should establish a sound support system, clarifying counselors' roles and responsibilities throughout the competition lifecycle—especially in project review, team management, ideological guidance, and formative assessment. It is recommended that colleges formally introduce a "Project Ideological and Political Mentor" system, assigning counselors as dedicated mentors to track students' developmental progress and ideological shifts, ensuring effective value-oriented guidance and deep integration of technical and moral education.

5.2. Strengthen Ideological Elements in Project Design

For IPE to be meaningfully embedded in competition-based education, competition tasks must be designed with clear ideological orientations. During the project planning phase, humanistic and civic values should be explicitly integrated—aligned with national strategies, industry trends, and social responsibilities. Embedding identifiable and assessable educational goals will encourage students to cultivate a stronger sense of mission and professional aspiration alongside technical advancement. For example, in projects centered on smart manufacturing, green energy, or rural revitalization, students should be guided to focus on social pain points and livelihood issues, enabling technology to reflect greater social care and ethical responsibility. This approach helps avoid a narrow pursuit of skills or results.

5.3. Build a Multi-Party Collaborative Education Team

High-quality education requires effective coordination mechanisms. It is recommended that vocational colleges establish a tripartite collaboration system involving counselors, professional instructors, and industry mentors—forming an integrated educational community that balances ideological and professional goals. Counselors lead value-oriented guidance and team cohesion; faculty provide technical mentorship and academic support; industry mentors contribute real-world perspectives and application scenarios. This synergy fosters students' integrated development of both skills and values. Meanwhile, cross-training should be enhanced to equip counselors and teachers with interdisciplinary capabilities, enabling the formation of a team that is well-versed in both ideological education and practical project mentoring.

6. Conclusion

Innovation and entrepreneurship competitions are not only platforms for showcasing technical ability but also important arenas for ideological and political education. As vocational education shifts toward high-quality development, the concept of cultivating talent with "moral integrity and technical expertise" imposes new expectations on counselors. They must take proactive roles throughout the planning, guidance, and reflection phases—serving as "guides for values" and embedding ideological education into every aspect of student growth.

This paper proposes a "Competition—Project—IPE" trinity integration model, which—from institutional construction, pathway design, to practical engagement—offers actionable strategies to organically integrate ideological education into professional practice. This model effectively addresses the current disconnect between technical training and value cultivation in innovation and entrepreneurship education.

Looking forward, vocational colleges should further deepen collaborative mechanisms, promote the integration of "Post, Course, Competition, Certificate" with the "Three All-round Education" system, and continuously improve the relevance and penetration of ideological education. These efforts will provide a solid foundation for cultivating high-quality technical talent with strong social responsibility, innovative spirit, and professional ethics.

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