

Research on the Integration Path and Practice of Philosophical Thinking in Higher Vocational Ideological and Political Education

Chun'e Ji

School of Marxism, Anyang Vocational and Technical College, Anyang 455000, Henan, China

Corresponding author: Chun'e Ji (e-mail: jichunyouxiang@163.com)

ABSTRACT This paper addresses problems in ideological and political education in higher vocational colleges, including abstract theoretical content and weak connection with professional practice. It proposes a “three-dimensional progressive” integration path that embeds philosophical thinking into the teaching process. Taking the characteristics of different majors into account, course content is reconstructed through modular design; the teaching process is reorganized through contextualized tasks, problem creation, and scenario construction; and the evaluation system is transformed into a diversified system combining process evaluation, work evaluation, and developmental evaluation. Experimental research in two higher vocational colleges shows that this path significantly improves students’ critical thinking disposition. The experimental group achieves a mean gain of 43.1 points on the CTDI-CV, increasing from 258.3 to 301.4, and significantly outperforms the control group. The effect size reaches Cohen’s $d = 1.32$. The path also improves learning experience, with teaching satisfaction reaching 4.4 out of 5, and promotes consistency between value identification and behavioral intention.

INDEX TERMS higher vocational education, ideological education, philosophical thinking, critical thinking, teaching evaluation

I. INTRODUCTION

At present, ideological and political education in higher vocational colleges faces practical challenges, including abstract teaching methods and a detachment from the technical ethics and craftsmanship required in intelligent weaving and high-precision machinery operations[1,2]. This disconnect weakens the effectiveness of value guidance by failing to ground ideological principles within the rigorous professional standards and innovative spirit of the modern industry. The traditional ideological and political education model focuses on knowledge communication, which is hard to give full play to responding to the development needs of vocational college students, so as to cause the situation that the accessibility and relevance of courses are needed to be improved[3]. Under this background, exploring the feasible ways to systematically integrate philosophical thinking into ideological and political education has become an important breakthrough in enhancing the ideological, theoretical and practical level of courses, and has practical significance in promoting the reform and innovation of ideological and political education in higher vocational colleges and implementing the fundamental task of cultivating morality and talent.

Existing research mainly focuses on exploring the intrinsic connection between philosophical thinking and ideological and political education, or discusses the importance of thinking cultivation from a macro perspective. Yanyue explored the path and practice of ideological and political curriculum reform in higher vocational colleges from the perspective of industry-university integration, aiming to improve students’ ideological and political quality, moral character and comprehensive ability through curriculum reform [4]. Qi et al. proposed a mixed teaching model of ideological and political education based on deep learning, aiming to integrate online and offline teaching with students as the center, and serve the teaching of public courses in colleges and universities and the cultivation of teachers’ values [5]. Gan and Bai reinterpreted the theoretical legacy of Karl Marx, aiming to promote the development of the philosophical and theoretical foundation in STEAM education, and called on the academic community to attach importance to positioning STEAM education as an emerging interdisciplinary field [6]. In order to promote the innovation of ideological and political courses, it is necessary to combine educational development norms and diverse methods, and use cutting-edge technologies for evaluation. To this

end, Zhang et al. proposed a teaching quality analysis model based on deep learning [7]. With the popularization of the "online and offline" mixed teaching model in colleges and universities, Wu explored the integration and application of this model in ideological and political teaching, and put forward reform suggestions on teaching methods and evaluation system, in order to provide reference for the current education system [8]. Kerruish proposed an inclusive framework called "prosthetic critical thinking" that integrates skills training and teaching practice in response to the challenges of commodification, Eurocentrism and digitalization faced by critical thinking in higher education [9]. Yun et al. proposed an innovative platform for ideological and political education based on deep learning, which aims to integrate multi-dimensional educational concepts to cope with external factors such as policies and trade and optimize the allocation of teaching resources [10]. Existing research methods are mainly based on theoretical explanation and experience summary, lacking long-term tracking and mixed research design, making it difficult to fully reveal the dynamic process and lasting impact of philosophical thinking in teaching. To this end, this study adopts a systematic research method of "path construction - practice verification - effect tracking", and strives to break through the limitations of existing research in practice transformation and evidence support by designing a "three-dimensional progressive" integration framework, conducting controlled teaching experiments and mixed assessments. This study aims to construct an integration path of philosophical thinking in higher vocational ideological and political education and conduct practice verification. By integrating literature review, case analysis, and quasi-experimental design, a three-pronged implementation framework of "content reconstruction—methodological innovation—evaluation reform" is proposed. A semester-long teaching intervention is conducted, and the impact of this approach on students' critical thinking, learning experience, and value-based behavioral intentions is systematically evaluated through quantitative assessment, qualitative observation, and follow-up surveys. This aims to provide a replicable and verifiable practical solution for improving the quality and efficiency of ideological and political education in higher vocational colleges, specifically by aligning value guidance with the rigorous craftsmanship and technical innovations of intelligent weaving and high-precision machinery.

II. MODULAR RESTRUCTURING INTEGRATING CONTENT

Its modular restructuring adopts a design logic of "guidance thinking methods—professional problem entry—value issue sublimation". That is, we choose philosophical thinking methods with high correlation to the goals of ideological and political education, such as dialectical thinking, systems thinking, critical thinking and logical thinking, as the "spirit" of core modules; carry out detailed research on real professional ethical dilemmas, technological and

social impacts, or contradictions in the development of industries faced by all kinds of professional subjects (equipment manufacturing, electronic information, finance and commerce, medicine and health, etc.) as the "flesh" of modules; and take philosophical thinking as an analytical method to let students naturally engage in in-depth analysis of professional issues by using philosophical thinking as a lubricant, thereby rationally understanding issues related to value, such as professional ethics, engineering ethics and social responsibility, so that value guidance becomes "like salt dissolving in water".

For equipment manufacturing majors, a module titled "Systems Thinking in Engineering Ethics" was developed. Using intelligent weaving and high-precision machinery as a contextual backdrop, students analyze the complex interactions among technical feasibility, production efficiency, environmental impact, and workforce safety within a fully automated production line. Finance and business major constructs a module on "Market Laws and Dialectical Analysis". Taking the analytical method of "contradiction analysis" and the perspective of "development" in dialectical thinking as the starting point, it guides students to analyze multiple contradictory relationships existing in multiple hot economic phenomena (such as efficiency and fairness, innovation and regulation), rationally view the boundaries of actions in the market and the necessity of government intervention, and further understand the ethics of socialist market economy.

III. CONTEXTUALIZED RECONSTRUCTION OF THE TEACHING PROCESS

To activate the modularly reconstructed teaching content and foster students' active engagement and deep thinking, this study systematically redesigned the classroom teaching process as follows: First, develop teaching scenarios with high realism and professional relevance. We discard simple examples and build complex scenarios close to professional practice that contain value conflicts. For instance, in the module of "Systems Thinking in Engineering Ethics", in addition to introducing the concept of responsibility, the lesson no longer merely sets up a simple scenario for students to appreciate. Instead, we provide students with a real event-based case study: suppose you are a young engineer working on a cross-river bridge project and it is in the critical construction phase when you confront with minor anomalies in technical data, huge pressure to finish the project sooner (i.e., to shorten the construction period in compliance with government plans) and serious concerns from the environmental group regarding the construction's impact on nearby wetlands. That is, students are put into a pressure system where they have to balance technical safety, political correctness, economic benefits and environmental protection in their minds. It is a real "battlefield" for students to use systems thinking.

Second, based on the realistic scenario, conduct structured and critical discussion about key issues. Teacher extracts a

sequence of progressively difficult questions according to the main contradiction in the scenario. For example, based on the above scenario, we can ask the following questions in sequence: What might a “minor technical anomaly” mean in systems engineering? When there is a conflict between economic benefits, administrative instructions and social responsibility in the short term, what priority should we give to which in decision-making? What necessary steps and considerations should an responsible engineering decision-making process include? Discussion is not free-form but requires students to use philosophical thinking tools of the relevant modules (e.g., holism and relevance principles in systems thinking) for structured analysis and to defend/argue for different positions. The teacher acts as a facilitator of critical inquiry, prompting students to examine the logical rigor and value premises of their arguments through targeted questioning, counterargumentation, and modeling. To ensure consistency and mitigate instructor bias, all participating teachers underwent a 12-hour training workshop prior to the intervention. The training covered: (a) the theoretical foundations of philosophical thinking and its application to vocational contexts, (b) structured protocols for facilitating Socratic-style discussions, and (c) calibration exercises using video-recorded classroom segments, with inter-rater agreement on facilitation techniques reaching 85% (Cohen’s $\kappa=0.82$). During the intervention, two trained observers independently coded 20% of randomly selected classroom sessions to monitor fidelity; deviations were minimal, and regular debriefing sessions were held to maintain procedural consistency.

Third, facilitate externalization of results and transfer of reflection, i.e., “integrated practice”. We require students to produce written results in the discussion, e.g., a decision memorandum, an ethical assessment report or a draft public statement. This is not only a review of thinking process but also a necessary training for externalizing and systematizing internal thinking. More importantly, we require students to engage in “metacognition” reflection, i.e., review and evaluate which thinking methods they used in the whole analysis process throughout, which cognitive pitfalls they have fallen into and what cognitive updates they have gained finally. By designing a new case that is similar to the original situation but with different background information, requiring students to transfer the practiced thinking patterns to another problem domain, we make them eventually make a leap from “learning a case” to “mastering a way of thinking”.

IV. DIVERSIFIED TRANSFORMATION OF THE EVALUATION SYSTEM

To truly leverage the guiding and diagnostic role of evaluation and promote a shift in teaching from a “knowledge-centered” to a “thinking and value-centered” approach, this study systematically designed a diversified transformation of the curriculum evaluation system. To this end, this study implemented a diversified transformation of the evaluation

system (as shown in Table 1).

TABLE 1. Composition and Quantitative Indicators of the Diversified Evaluation System

Assessment Type	Tool / Artifact	Core Dimensions	Weight	Key Metrics (Simplified)
Process Performance	Observation Rubric, Discussion Logs	Engagement, Method Application	30%	Issue identification, systemic thinking, counterargument
Artifact Evaluation	Ethical Analysis Report, Policy Memo	Depth of Analysis, Solution Innovation	40%	Analytical comprehensiveness, logical coherence, value consistency
Developmental Value-added	Pre-/Post-test (CTDI-CV), Learning Portfolio	Progress in Thinking, Cognitive Growth	30%	Score improvement, reflection depth, metacognitive awareness

The key point of this transition is to move from a single outcome-level evaluation to a comprehensive evaluation covering multiple aspects of “process performance” evaluation, “thinking-based works” evaluation, and “developmental value-added” evaluation. These three assessment types were administered independently, with each yielding a numerical score. The final course grade was calculated as a weighted composite: 30% from process performance, 40% from artifact evaluation, and 30% from developmental value-added assessment. No minimum threshold was imposed for individual components, ensuring that strengths in one area could compensate for weaknesses in another, consistent with the formative orientation of the evaluation system.

That is, we built a whole-process evaluation system including three parts:

1) Process performance evaluation during the whole teaching process. In terms of classroom discussion and debate, we developed a “Classroom Thinking Performance Observation Scale” that not only recorded the number of students who participated in statements but also evaluated thinking characteristics reflected in the statements, including: whether the students could find out the main contradictions of a problem (systematicness and dialectical thinking); whether the students discussed various levels of system impacts brought about by alternative decisions (systematicness); whether the argumentation logic was rigorous and whether they could reflect on the weaknesses of their own arguments (critical thinking). Both teachers and trained student observers recorded and scored these statements to make thinking activities observable and quantifiable evaluation objects;

2) Output of thought process evaluation. In terms of students’ practical assignments after learning relevant modules, we evaluated mainly their ethics decision-making report, project feasibility analysis, and short essay commenting on public policy. Evaluation criteria were not only specified in terms of format and word count but also focused on the depth of philosophical thinking and innovativeness in solving problems. For example, in evaluating an “Engineering Ethics Decision-Making Report,” in addition to checking whether it analyzed multi-dimensional factors including technology, environment, and society (systems thinking);

whether it weighed the advantages and disadvantages of different solutions and indicated the basis of value selection (dialectical thinking); and whether the chain of argumentation was complete and could stand scrutiny (logic and critical thinking), we evaluated the completeness of argumentation chains. Through evaluation of these works, thinking processes that were implicit became finely assessable statements;

3) Evaluation of developmental value-added in individual growth. To weaken the influence of differences in initial knowledge levels of students, we developed standardized evaluation tools including the "Critical Thinking Disposition Scale" (CTDI-CV) and implemented pre- and post-tests at the beginning and end of the semester. In addition to checking the absolute final score, we not only focused on each student's growth in different aspects of critical thinking (curiosity, analytical skills, cognitive maturity, etc.) but also encouraged students to develop their personal learning portfolios including log of reflections, outline of discussions, and draft projects at different stages. At the end of the semester, by reviewing and comparing, students could visually see the process of their changing thinking habits and cognitive levels. This method of evaluation aimed to encourage each student to compare himself/herself with his/her own past self and gain satisfaction from his/her growth.

V. VERIFICATION OF THE EFFECT OF INTEGRATING PHILOSOPHICAL THINKING INTO PRACTICE

A. EXPERIMENTAL SETUP

This study employed a quasi-experimental design with a mixed-method approach to systematically evaluate the effectiveness of integrating philosophical thinking into ideological and political education. A non-equivalent control group pretest-posttest design was used. In a natural classroom setting, two parallel classes with comparable academic backgrounds and professional training were selected from a vocational college. They were randomly assigned to an experimental group, which received the new teaching approach, and a control group, which followed traditional instruction. The intervention spanned one semester. The independent variable was the implementation of the philosophical thinking integration approach, while the dependent variables encompassed three dimensions: students' critical thinking disposition, course satisfaction, and value judgments and behavioral intentions in simulated scenarios. The procedure strictly followed pretest, intervention, and posttest phases. For data collection and analysis, quantitative and qualitative methods were triangulated. Quantitatively, the Chinese version of the Critical Thinking Disposition Scale and a self-developed satisfaction questionnaire were administered, with independent and paired samples t-tests used to examine between- and within-group differences. Qualitatively, systematic thematic coding and textual analysis were

applied to classroom observations, student written work,

and interview transcripts to objectively assess the practical effects of the integrated approach from multiple perspectives.

B. QUANTITATIVE EXPERIMENT ON CRITICAL THINKING DEVELOPMENT BASED ON A CONTROL GROUP

This experiment uses quasi-experimental method, randomly chooses two parallel classes of the same major in a vocational college, and then uses experimental group ($n=45$) and control group ($n=48$). The experimental group uses one-semester philosophy-integrated ideological and political education program, and the control group continues the traditional teaching mode. Use Chinese version of Critical Thinking Tendency Scale before and after teaching program. This study was approved by the Ethics Committee of Anyang Vocational and Technical College, and was performed in accordance with the principles of the Declaration of Helsinki. All eligible participants signed an informed consent form. The experimental effect is quantitatively analyzed by comparison of changing situation of two classes in seven dimensions and total score.

Figure 1 shows that systematically integrating philosophical thinking into vocational college ideological and political education courses significantly improves students' critical thinking disposition. The experimental group ($n=45$) showed a significant improvement, with mean total scores increasing from 258.3 ($SD = 18.5$) at pretest to 301.4 ($SD = 15.2$) at posttest, a gain of 43.1 points (+12.3%). In comparison, the control group ($n=48$) improved from 260.1 ($SD = 17.9$) to 277.6 ($SD = 16.8$), a gain of 17.5 points (+6.7%). The difference in gains was statistically significant (25.6 points, $t(91) = 8.34$, $p < 0.001$), with a large effect size (Cohen's $d=1.32$). The most pronounced gain was observed in the "critical thinking confidence" subscale (+10.3 points, $d=1.25$). The results indicate that this integration path effectively promotes the substantial development of students' thinking qualities, providing empirical evidence for the reform of vocational college ideological and political education.

C. HYBRID ASSESSMENT EXPERIMENT OF COURSE TEACHING QUALITY AND LEARNING EXPERIENCE

This experiment adopted a hybrid research method to evaluate the subjective performance of students in the experimental group who participated in the integration of philosophical thinking in teaching. We developed a five-point questionnaire to evaluate the students' subjective performance in five aspects: content critical thinking and practical relevance. At the same time, we adopted classroom observation and text analysis methods to qualitatively evaluate the depth of interaction with students and the quality of reflection report and degree of shift in thinking pattern of some students. This method attempts to acquire the first-hand data of course implementation effect from subjective and objective aspects.

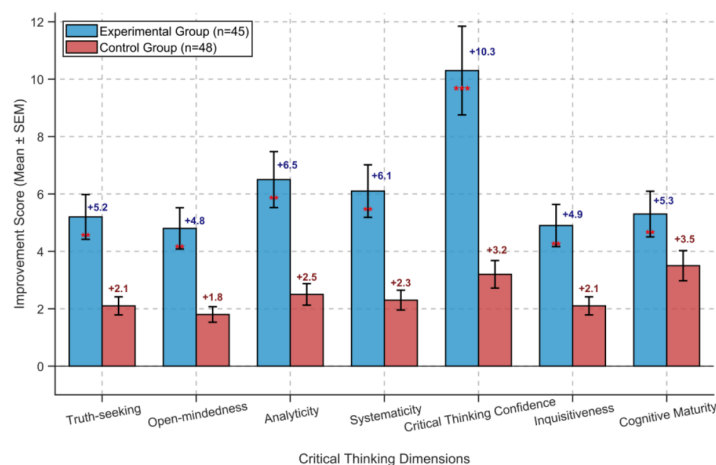


FIGURE 1. Quantitative Comparison of Critical Thinking Development Based on Control Group

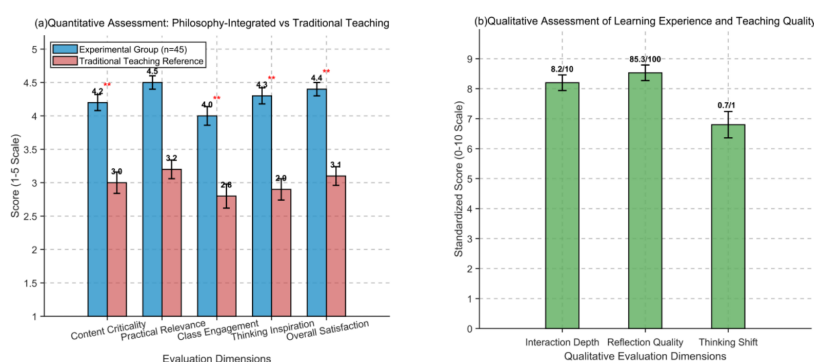


FIGURE 2. Hybrid Assessment of Course Teaching Quality and Learning Experience

The quantitative assessment (Figure 2a) shows that the experimental group scored significantly higher than the traditional teaching reference across all five dimensions: content critical thinking (4.2), practical relevance (4.5), classroom participation (4.0), thinking inspiration (4.3), and overall satisfaction (4.4) ($p < 0.01$). The qualitative assessment (Figure 2b) shows classroom interaction depth at 8.2 (1–10 scale), reflection report quality at 85.3 (0–100 scale), and a thinking shift index of 0.68 (0–1 scale). The latter was derived from three coded interview dimensions (explicit awareness, contradiction identification, self-reported change)

with inter-rater reliability ($\kappa = 0.81$) and a threshold of 0.5 for meaningful shift. Together, the quantitative and qualitative data confirm that this teaching model effectively promotes teaching effectiveness and deep student participation.

D. LONGITUDINAL STUDY ON VALUE PERCEPTION AND BEHAVIORAL INTENTIONS

This experiment adopted a longitudinal study design. Follow up interviews with students in experimental group were carried out 1–3 months after the end of the course. Based on situational simulation test, semi-structured interview and

behavioral intention questionnaire, the students' reasons for value judgment and behavioral choice under ethical dilemma were collected, and then the influence of philosophical thinking teaching effect on value perception and behavioral decision was analyzed.

TABLE 2. Tracking Survey and Evaluation of Value Perception and Behavioral Intention

Scenario Dimension	Value Recognition Rate (%)	Rational Decision-Making Tendency (%)	Behavioral Intention Strength (Mean/5 points)
Professional Integrity Dilemma	88.9	84.4	4.2
Team vs. Individual Interest Conflict	82.2	77.8	4.0
Social Responsibility Cognition	91.1	86.7	4.3
Rule Compliance vs. Innovation Balance	75.6	71.1	3.8
Public Interest Priority Judgment	86.7	82.2	4.1
Sustainable Development Values	80.0	75.6	3.9
Overall Mean	84.1	79.6	4.0

In Table 2, three months after the course ended, the

experimental group students achieved an average value identification rate of 84.1% and a rational decision-making tendency of 79.6% in the six professional ethics scenarios, with a mean behavioral intention strength of 4.0 points (out of 5). Cognition and behavioral intentions showed a significant positive correlation ($r=0.72$). The results indicate that integrating philosophical thinking into teaching has a lasting impact on the internalization of students' value cognition and the guidance of their behavioral intentions, especially in the dimensions of professional integrity (88.9% recognition) and social responsibility (91.1% recognition).

VI. CONCLUSION

This study proves that the 'three-dimensional progressive' integration mode improves the effectiveness of ideological and political education by embedding core values into the technical rigor and craftsmanship required for intelligent weaving and high-precision machinery operations. The experimental results demonstrate that the "three-dimensional progressive" integration mode significantly enhances students' critical thinking disposition, with a large effect size ($d = 1.32$). The experimental group achieved a mean gain of 43.1 points (+12.3%) on the CTDI-CV, substantially outperforming the control group's 17.5-point (+6.7%) gain ($p<0.001$). The path also optimized the learning experience and demonstrated sustained impact on value identification and behavioral intention. The research still has some deficiencies, such as small sample and a short follow-up time. Future research will involve cross-school and cross-professional verification to explore the deep integration of ideological education with vocational ability evaluation systems specifically designed for intelligent weaving and high-precision machinery operations. This approach achieves systematic innovation in vocational education by aligning value guidance with the technical rigor and craftsmanship standards required to empower the next generation of engineering professionals.

AUTHOR CONTRIBUTIONS

Chun'e Ji designed, collected and analyzed the data, and drafted the manuscript. Chun'e Ji conducted the study, critically revised the manuscript for important intellectual content, and gave final approval of the version to be published. Chun'e Ji 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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