ISSN: 1813-4890

Application of AI-Based "Case Teaching Method" in Ideological and Political Courses of Secondary Vocational Education

Jingyi Cao

School of Information Technology Engineering, Tianjin University of Technology and Education, Tianjin 300222, China.

Abstract

To address the "three dilemmas" faced by Ideological and Political Courses in secondary vocational education, this study explores the application of the AI-based "Case Teaching Method" in such courses. First, the study analyzes the existing problems in the teaching of Ideological and Political Courses in secondary vocational education. Then, it expounds on the connotation and advantages of the AI-based "Case Teaching Method". Furthermore, four application strategies are proposed: constructing a three-dimensional collaborative intelligent case resource library of "Ideological and Political Education + Major + Industry", creating a three-stage progressive immersive teaching paradigm of "Cognition - Experience - Transfer", providing personalized learning support featuring "Data-Driven - Precise Response - Dynamic Adjustment", and establishing an intelligent evaluation system of "Process & Result" for mutual promotion and efficiency enhancement. Practice shows that this teaching method can effectively improve the teaching effectiveness of the courses and students' professional literacy. However, during the promotion process, attention should be paid to issues such as technology adaptation, improvement of teachers' digital literacy, and prevention and control of ethical risks. This study provides references for the innovation of Ideological and Political Courses in secondary vocational education.

Keywords

AI, Case Teaching Method, Ideological and Political Courses in Secondary Vocational Education, Application Strategies.

1. Introduction

In recent years, the Communist Party of China (CPC) Central Committee and the State Council have attached great importance to the development of vocational education, and successively issued a series of policies and guidelines to point out the direction for the reform and development of vocational colleges. In the process of promoting the high-quality development of vocational education, the importance of ideological and political education has become increasingly prominent. It is not only the core carrier for implementing the fundamental task of "fostering virtue through education", but also an inherent requirement for improving the quality of talent cultivation in vocational education. As clearly stated in the Action Plan for Improving the Quality and Excellence of Vocational Education (2020-2023), efforts should be made to enhance the adaptability of vocational colleges, strengthen the improvement of students' comprehensive quality in vocational colleges, and especially emphasize the deepening of the reform of ideological and political education, as well as the innovation of teaching models and methods, so as to cultivate high-quality technical and skilled talents who are well-developed in moral, intellectual, physical, aesthetic and labor education [1]. However, in reality, Ideological and Political Courses in secondary vocational education are trapped in the "three dilemmas": first, the "learning dilemma" caused by the mutual interaction between students' weak cognitive foundation and the constraints of course characteristics; second, the

ISSN: 1813-4890

"teaching dilemma for teachers" resulting from the superposition of unbalanced teacher structure and hindered professional development; third, the "teaching dilemma in methodology" triggered by the mismatch between the traditional ideological and political education paradigm and the educational logic of vocational education. Against this background, the traditional teaching model can no longer meet the development needs of ideological and political education in secondary vocational education in the new era, and it has become an urgent task to explore new teaching paths that adapt to the characteristics of secondary vocational education and conform to the law of students' growth. As an emerging educational paradigm, the AI-based "Case Teaching Method" can not only transform abstract ideological and political theories into concrete vocational scenario cases, but also provide teachers with rich and accurate case resources and teaching support. Moreover, it can break the barrier between the traditional ideological and political education paradigm and the educational logic of vocational education, thus effectively addressing the "three dilemmas" faced by Ideological and Political Courses in secondary vocational education. Therefore, in-depth exploration of the application of the AI-based "Case Teaching Method" in Ideological and Political Courses in secondary vocational education is of great significance for breaking the bottleneck of traditional teaching and improving the effectiveness of ideological and political education. This study will start from the theoretical basis of the AI-based "Case Teaching Method", elaborate on its specific application paths in Ideological and Political Courses in secondary vocational education, and aim to provide a feasible reference plan for the teaching innovation of Ideological and Political Courses in secondary vocational education in the new era.

2. Problems Existing in the Teaching of Ideological and Political Courses in Secondary Vocational Colleges

Ideological and Political Courses are the key courses for implementing the fundamental task of "fostering virtue through education". Specifically, Ideological and Political Courses in secondary vocational education are compulsory public basic courses for students of all majors in secondary vocational schools. They not only undertake the important responsibility of guiding students to establish correct value orientations, but also need to integrate the characteristics of vocational education to cultivate students' professional ethics, craftsmanship spirit and social responsibility, thus laying a solid ideological foundation for them to become high-quality technical and skilled talents [2]. However, at present, the teaching of Ideological and Political Courses in secondary vocational education is trapped in the triple dilemmas of "difficulty in learning", "difficulty for teachers" and "difficulty in teaching", which seriously restricts the effective exertion of the function of ideological and political education.

First is the "difficulty in learning". Ideological and Political Courses feature strong theoretical, systematic, and historical nature [3], which imposes certain requirements on students' abstract thinking ability, logical analysis ability, and knowledge reserve level. They not only require students to have a solid knowledge reserve and cultural literacy, but also demand that students can connect scattered knowledge points into a "line" and weave them into a "network", while conducting in-depth interpretation in combination with historical backgrounds and practical situations. However, most students in secondary vocational education are from the group diverted after the senior high school entrance examination, and they have common problems such as "weak academic foundation, poor learning habits, limited abilities, and low interest". In addition, the traditional teaching model emphasizes theory over practice, focuses on indoctrination rather than guidance, and relies more on preaching than interaction. These factors together lead students into a learning dilemma characterized by "memorizing without understanding, analyzing without depth, applying without accuracy, and perceiving without resonance".

ISSN: 1813-4890

Second is the "difficulty for teachers". There exist structural contradictions in the team construction of Ideological and Political Course teachers in secondary vocational colleges, facing not only the practical dilemma of "insufficient quantity" but also the in-depth hidden concern of "uneven quality". From the organizational perspective, secondary vocational colleges generally have the problem of "three more and three less": there are more part-time Ideological and Political Course teachers than full-time ones, more teachers with non-normal education backgrounds than those with normal education backgrounds, and more teachers with single-discipline backgrounds than interdisciplinary and compound talents [4]. These problems have seriously affected the teaching efficiency of Ideological and Political Courses. For instance, part-time teachers frequently have the phenomenon of "rush-style teaching", resulting in insufficient depth and emotional engagement in the courses; teachers with non-normal education backgrounds generally lack teaching theories and professional skills, which greatly reduces the teaching effect; teachers with single-discipline backgrounds are limited by their knowledge structure, leading to isolated and rigid teaching content. From the individual perspective, Ideological and Political Course teachers in secondary vocational colleges generally face "three levels of obstacles": at the professional development level, due to the imperfection of mechanisms such as special training, professional title evaluation, and performance distribution, teachers are confronted with the triple dilemmas of "low professional attractiveness", "narrow professional growth path", and "high professional burnout rate". This further results in insufficient stability of the teacher team, weakened teaching innovation ability, and limited effectiveness of course-based moral education. At the teaching competence level, some teachers lack sufficient teaching competence, which is prominently reflected in the backward innovation of teaching methods, insufficient application of cutting-edge technologies, inadequate accuracy in student learning situation analysis, and weak interdisciplinary integration ability. These overlapping problems have trapped Ideological and Political Courses in a vicious cycle of "rigid classroom ecology → disconnected content supply → ineffective targeted education → broken interdisciplinary collaboration → declining teaching effectiveness". At the level of integration of teaching and research, the current reform of Ideological and Political Courses in secondary vocational colleges faces multiple obstacles: First, the lack of a teaching-research collaboration mechanism. Most teachers only regard teaching and research as a "mandatory task" for professional title review, lacking the initiative of "promoting teaching through research and driving research through teaching", which leads to a prominent phenomenon of "disconnection between teaching practice and research projects". In addition, some teachers rush to apply for homogeneous research projects to meet assessment indicators, but rarely feed back research results into classroom design, reducing teaching and research activities to a formalized process of "empty talk on paper". Second, the low conversion rate of scientific research achievements. Existing studies mostly focus on theoretical categories such as macro interpretation of national policies, in-depth analysis of philosophical theories, and theoretical innovation in education and teaching, while there is insufficient empirical research on fields such as the collaborative moral education of Ideological and Political Courses and professional courses, the empowerment of digital technologies in Ideological and Political teaching, and the exploration of interdisciplinary integration paths. A large number of research projects remain at the level of concept explanation and experience summary, failing to form practical, replicable, and promotable teaching paradigms or course resources. Third, the relatively weak teaching and research capabilities. Ideological and Political Course teachers in secondary vocational colleges generally have the dual shortcomings of shallow theoretical reserves and insufficient technical methods, making it difficult for them to carry out high-quality research projects.

Third is the "difficulty in teaching". Vocational education is employment-oriented, and its talent cultivation goal focuses on post competence and industrial adaptability. There is a structural

ISSN: 1813-4890

contradiction between this goal and the traditional ideological and political education paradigm, which emphasizes knowledge imparting and value advocacy. This contradiction is specifically manifested in the following aspects: First, the disconnection between the "universality" and "professionality" of course content. The content of traditional Ideological and Political Courses focuses on ideological transmission, and fails to fully integrate professional ethics, post norms and industry regulations required by different professional posts. Second, the imbalance between the "supply side" and "demand side" of teaching methods. At present, most Ideological and Political Courses adopt a one-way indoctrination teaching model, lacking interactive teaching methods based on professional scenarios. In addition, the application rate of digital tools is relatively low, which makes it difficult to stimulate students' learning interest and initiative. Third, the mismatch between the "result-oriented" and "process-oriented" evaluation standards. At present, the assessment of Ideological and Political Courses still focuses on paper scores, with emphasis on the degree of knowledge memory. It ignores the process-based observation of students' professional behavior cultivation and cannot effectively evaluate the internalization degree of students' professional ethics.

3. AI-Based "Case Teaching Method"

Artificial Intelligence (AI) is a cutting-edge technology field that takes data as the foundation, algorithms as the core, and computing power as the support. By simulating, extending, and expanding human intelligence, it researches and develops relevant theories, methods, and technologies [5]. In the field of education, AI is profoundly reshaping traditional teaching models and learning paradigms. It provides strong technical support for specialized areas such as personalized learning path planning, dynamic adjustment of precise teaching, and real-time response of intelligent tutoring, driving education toward a more efficient, equitable, and diverse direction. The Case Teaching Method is an instructional approach that takes scenarios created by cases as the carrier. It guides students to apply the knowledge they have learned to analyze and solve practical problems, thereby effectively realizing the transformation of theoretical knowledge into practical abilities [6]. This teaching method can effectively stimulate students' interest in classroom learning, highlight students' dominant position in the classroom, and enhance their ability to connect theory with practice. Meanwhile, the Case Teaching Method also helps cultivate students' innovative awareness and independent thinking ability. When facing complex and changeable case scenarios, students need to proactively apply interdisciplinary knowledge and adopt thinking methods such as comprehensive analysis, induction and deduction, and analogy-based transfer to explore solutions. This process can effectively exercise their divergent thinking and ability to solve problems creatively.

The AI-based "Case Teaching Method", however, is an innovative paradigm that deeply integrates artificial intelligence technology with the Case Teaching Method. It promotes the transformation and upgrading of the traditional Case Teaching Method toward personalization and intellectualization, providing students with a more intuitive, interactive, and intelligent learning experience [7]. This teaching method not only retains the core advantages of the Case Teaching Method—such as taking scenarios as the carrier and problems as the guide—but also achieves a breakthrough improvement in teaching efficiency by leveraging the technical characteristics of AI. Specifically, its innovative value is mainly reflected in the following four dimensions: First, the dynamic generation and precise adaptation of intelligent case resources. Relying on massive industry data, teaching syllabi, and students' proficiency levels, AI can intelligently generate high-quality cases that align with real professional scenarios and update them in real time. Second, the virtual reconstruction and multi-dimensional interaction of immersive case scenarios. With the help of technical tools such as virtual reality (VR), augmented reality (AR), and mixed reality (MR), AI can transform abstract industry scenarios

into tangible digital simulation environments, fully reproducing the temporal-spatial logic and operational processes in real scenarios. Through multi-modal interaction methods—including voice commands, gesture control, and data input—students can interact in real time with various elements in the virtual environment, deeply participating in the advancement of case scenarios and the process of problem-solving. Third, the intelligent planning of personalized learning paths and dynamic tutoring. AI tracks students' performance throughout the case analysis process, including their understanding of problems, the analytical methods they adopt, and the final conclusions they draw. By mining these data, it accurately identifies students' knowledge gaps and ability shortcomings, tailors subsequent learning paths for them, and automatically pushes supplementary cases, relevant theoretical interpretations, or targeted exercises. In addition, when students encounter bottlenecks in case analysis, AI can provide heuristic guidance in the form of intelligent Q&A to help them overcome thinking obstacles. Fourth, the full-process coverage and in-depth diagnosis of intelligent evaluation tools. Different from the single and static evaluation methods in traditional case teaching, AI can construct a three-dimensional evaluation system covering the entire process. This system can not only capture real-time behavioral data of students during case discussions—such as speech content, participation in discussions, and interaction frequency—and conduct a comprehensive assessment of basic indicators (e.g., knowledge mastery, discussion participation, and collaborative contribution) based on these data [8]; it can also quantitatively evaluate students' high-level thinking qualities (e.g., problem understanding, argument rigor, and decision rationality) through methods such as natural language processing (NLP), logical reasoning analysis, and behavioral data analysis. These values are interrelated and progressive, collectively forming the unique advantages of the AI-based "Case Teaching Method".

4. Application Strategies of the AI-Based "Case Teaching Method" in Ideological and Political Courses of Secondary Vocational Education

4.1. Resource Development and Integration: Construction of an Intelligent Case Resource Library with Three-Dimensional Collaboration of "Ideological and Political Education + Major + Industry"

The intelligent case resource library with the three-dimensional collaboration of "Ideological and Political Education + Major + Industry" serves as the core carrier for AI to empower ideological and political education in secondary vocational education. First, AI conducts a comprehensive analysis of three aspects: the basic situation of secondary vocational students (such as cognitive level, learning habits, and interest preferences), the training objectives of Ideological and Political Courses (including the shaping of values, the improvement of moral literacy, and the cultivation of professional spirit), and the latest developments in industry (such as directions of technological innovation, post competence requirements, and professional ethics norms). Based on the analysis results, it accurately retrieves high-quality cases that match the needs. Subsequently, teachers conduct a secondary screening of the retrieved cases according to the teaching plan of Ideological and Political Courses, the correlation with the major studied, and the actual needs of industry development, and transform these cases into high-quality teaching resources that meet teaching requirements. Then, with the assistance of AI, teachers conduct in-depth analysis and detailed organization of the selected cases, further expanding the connotation and extension of the cases, and endowing them with stronger ideological and political education functions and more effective professional education effects. Finally, an intelligent case resource library is built through AI technology to realize the intelligent labeled classification of cases (by major, theme, difficulty level, etc.), facilitating teachers to quickly retrieve and accurately use the cases. At the same time, crawler technology is used to connect with industry dynamic data, automatically updating

ISSN: 1813-4890

case details and introducing more suitable cases to ensure the professional adaptability and temporal relevance of the cases. In addition, a manual login portal for teachers is set up to encourage them to update and optimize cases in a personalized way based on teaching practice, forming a two-way update mechanism of "AI generation + manual supplementation" to continuously improve the quality and effectiveness of case resources.

For example, in the "Professional Ethics" course for the E-commerce major, AI analyzes and finds that students have a strong interest in the "live-streaming e-commerce" scenario. This field involves key ideological and political points such as "integrity in business operations" and "protection of consumers' rights and interests", while the industry has recently witnessed frequent hot events like "false advertising" and "data fraud". Based on this, AI retrieves cases such as a livestream host being penalized for exaggerating product efficacy and a new policy issued by a platform to regulate livestreaming behavior. Combined with the teaching plan, teachers select and refine the typical case of "a host conducting false advertising despite knowing the product has defects": on the one hand, they retain industry-specific practical details in the case, such as "consumer complaints" and "investigation and punishment by regulatory authorities"; on the other hand, with AI assistance, they supplement theoretical interpretations like "integrity is the lifeline of the e-commerce industry", legal content such as "provisions on false advertising in the E-commerce Law", and design critical thinking questions like "If you were a member of the host's team, how would you advise the host?". Subsequently, this case is labeled with "E-commerce Major", "Theme of Integrity in Business Operations", "Medium Difficulty" and other tags and stored in the resource library. When the industry issues a new policy on the code of conduct for livestream marketing personnel, AI automatically updates the legal basis in the case; teachers, based on the performance of students in the class during simulated livestreaming, supplement discussion points such as "how to adhere to integrity while pursuing sales volume", ensuring that the case always keeps pace with students' growth.

4.2. Case Presentation and Application: Building a Progressive Immersive Teaching Paradigm of "Cognition - Experience - Transfer"

The progressive immersive teaching paradigm of "Cognition - Experience - Transfer" takes AI technology as the link and constructs a complete closed loop from knowledge construction to practical transfer. In the Cognition Stage, to help students better understand relatively abstract knowledge such as philosophical theories, professional norms, and values, teachers use AI's text analysis technology to decompose abstract theoretical knowledge into specific case elements. Based on these elements, they then use AI's intelligent recommendation technology to accurately select the most representative cases from the intelligent case resource library, providing concrete "attachment points" for abstract knowledge. After that, AI's multimodal generation technology is used to present case content in multimodal forms such as text, images, and videos, further enhancing students' understanding and perception of the cases and making abstract knowledge more vivid and accessible. Next, teachers design a progressive chain of questions based on the analysis of the selected cases, guiding students to deeply understand the theoretical knowledge contained therein and achieve the leap from perceptual cognition to rational cognition. Finally, teachers organize students to conduct case discussions, encouraging them to share their insights and thoughts to promote the internalization of knowledge and the deepening of understanding. In the Experience Stage, teachers use virtual reality technology to create virtual professional scenarios related to the cases, allowing students to experience the situations and contexts in the cases immersively. Through role-playing, interactive communication, simulated operations, and other methods, students deeply participate in the advancement of case scenarios and the problem-solving process, which deepens their understanding and application of theoretical knowledge. In the Transfer Stage, based on the

ISSN: 1813-4890

performance data of students in the Cognition and Experience Stages, AI accurately identifies the knowledge points and skills they have mastered. According to this, it selects more challenging high-quality cases from the intelligent case resource library, guiding students to complete knowledge transfer and innovative application in new contexts. This realizes the leap from rigid imitation of a single case to flexible response in diverse contexts.

For example, in the "Professional Ethics" course for the Automotive Maintenance major in secondary vocational education, centered on the core theme of "integrity in service", the teaching process of the three stages presents a clear progressive logic: In the Cognition Stage, AI decomposes "integrity in service" into case elements such as "truthfully informing about faults", "reasonable pricing", and "refusing to substitute inferior parts for quality ones". It then selects a basic case from the resource library – "an automotive mechanic proactively explaining that a part can be repaired instead of directly replacing it". AI-generated animation videos are used to present key dialogues in the maintenance scenario, such as "the customer questioning the quotation" and "the mechanic showing the inspection report to explain", with supplementary interpretations of provisions related to "truthful disclosure" in the Regulations on the Administration of Motor Vehicle Maintenance. Teachers design a chain of questions: "Why did the mechanic's approach in the case win the customer's trust?" and "What short-term and long-term impacts would result from concealing the fact that the part can be repaired?" – guiding students to refine the core cognition that "integrity is the lifeline of a profession" through group discussions. In the Experience Stage, students enter a virtual automotive maintenance workshop via VR equipment and play the role of a maintenance technician to handle the case of "abnormal noise in a customer's vehicle". When the AI-simulated "customer" repeatedly emphasizes "only using original factory parts", students must decide in the virtual operation whether to truthfully inform the customer that "non-core parts can be replaced with compatible alternatives that offer better cost-effectiveness". If they choose to conceal this information, the system triggers a negative scenario of "the customer filing a complaint after discovering the truth" and pops up a reminder about "the damage to the shop's reputation caused by lack of integrity"; if they insist on truthful communication, the virtual customer provides positive feedback such as "understanding and gratitude", strengthening students' emotional identification with honest behavior. In the Transfer Stage, based on students' performance data in previous stages – such as their abilities in "pricing transparency" and "clarity in explaining faults" – AI pushes a more complex case of "used car inspection disputes": the customer conceals the vehicle's accident record and demands a "no major accidents" report. Students must comprehensively apply knowledge such as "the principle of integrity", "industry standards", and "communication skills" to respond to pressure scenarios in the virtual environment, such as "the customer implying benefits" and "threatening to file a complaint". At this point, students cannot simply apply the previous "truthful disclosure" model; instead, they must, while adhering to bottom-line principles, flexibly design response plans using AI-generated tools such as "legal provision citation templates" and "evidence preservation guidelines" – for instance, "using a third-party inspection report to confirm facts" and "explaining the legal risks of concealing accidents". Ultimately, this achieves the transfer from "integrity in single-scenario operations" to "integrity wisdom in complex scenarios", truly transforming ideological and political requirements into professional capabilities.

4.3. Personalized Assistance and Support: Provision of Trinitarian Personalized Learning Support Featuring "Data-Driven - Precise Response - Dynamic Adjustment"

The trinitarian personalized learning support system of "Data-Driven - Precise Response - Dynamic Adjustment" implements the educational concept of "teaching students in accordance with their aptitude" through the in-depth involvement of AI technology. In the Data-Driven

ISSN: 1813-4890

Phase, AI collects multi-dimensional and full-time student behavior data, including classroom interaction records, homework completion status, case analysis performance, and in-class test scores. Subsequently, AI analyzes and mines these data; through data cleaning, integration, and modeling, it generates a three-dimensional learning profile that includes elements such as "knowledge weaknesses" and "ability strengths". In the Precise Response Phase, AI provides targeted support services for students based on the previously created learning profiles. For example, to address weaknesses in theoretical knowledge, AI offers gradient learning resources and progressive tutoring; to tackle shortcomings in practical skills, it provides targeted training tasks and personalized improvement suggestions. In addition, AI can also serve as a "learning assistant" to provide students with all-weather accompanying learning support, truly realizing a learning experience where "questions are answered anytime and confusions are resolved instantly". In the Dynamic Adjustment Phase, AI conducts regular review and analysis of students' learning data on a weekly basis. Based on students' new learning progress and emerging learning needs, it updates the original improvement plans and pushes adapted teaching resources. Teachers then flexibly adjust teaching content and strategies according to these suggestions and feedback, ensuring that learning support is always synchronized with students' development status.

For example, in the study of the "Professional Ethics" course by a student majoring in Logistics in a secondary vocational college, AI identified through data collection that: the student achieved high quality in homework related to "goods delivery timeliness" cases (with an accuracy rate of 85%), but scored only 60% in the analysis of "goods integrity and customer communication" cases; the number of interactive speeches on "integrity in delivery" in class was less than half of the class average; and the error rate in "customer rights protection" related questions in in-class tests reached 40%. After data analysis and modeling, AI generated a learning profile including elements such as "knowledge weakness: customer rights protection theory" and "ability strength: cognition of timeliness management". In the Precise Response Phase, AI first pushed a short video case of "a courier truthfully informing customers of goods damage and taking the initiative to settle claims", accompanied by graphic interpretations of "customer rights protection clauses" to help the student consolidate theoretical foundations. Then, it designed a training task in a "virtual delivery scenario", allowing the student to simulate handling the situation of "discovering goods damage during sign-off"; AI provided real-time "communication script suggestions" (e.g., "Hello, we apologize for this situation. We will immediately arrange a replacement for you and cover the shipping cost"). Meanwhile, AI interacted with the student in the role of a "learning assistant": when the student asked, "What if the customer makes an excessive demand?", AI instantly pushed cases on "the distinction between reasonable claims and excessive claims" along with relevant legal interpretations. In the Dynamic Adjustment Phase, the first-week review showed that the student (referred to as Zhang) had improved his mastery of theoretical knowledge (the accuracy rate of related tests rose to 75%), but still had the problem of "avoiding customer emotional comfort" in virtual scenarios. AI immediately updated the plan: it added "role-playing cases for customer complaint handling" and increased the frequency of interactive discussions. Based on AI's feedback, the teacher also specifically organized a group debate on "how to balance enterprise costs and customer rights" in class, assigning the student as the group leader to urge him to take the initiative to express his views. Data from the second week showed that the student's score in communication response in new cases rose to 80%, and the number of in-class speeches also increased significantly. Accordingly, AI and the teacher adjusted their support strategies to "pushing more complex cases of multi-customer conflicts", promoting the continuous advancement of the student's abilities.

ISSN: 1813-4890

4.4. Intelligent Evaluation and Feedback: Establishment of an Intelligent Evaluation System for Mutual Improvement of "Process & Outcome"

The intelligent evaluation system for the mutual improvement of "Process & Outcome" is based on behavioral data throughout the learning process and takes the quality performance of phased achievements as the criterion. It realizes the mutual improvement of formative evaluation and summative evaluation through AI technology. Among them, formative evaluation focuses on the dynamic capture of learning trajectories. Through real-time collection via intelligent terminals, multi-modal data fusion analysis, and dynamic generation of personalized feedback, it achieves multi-dimensional, full-process, and refined recording and evaluation of students' case-based learning. First, AI uses various intelligent terminals (such as mobile phones, tablets, etc.) to real-time capture multi-dimensional data of students, including their analytical thinking and viewpoint expression in case interpretation, operation trajectories and decision-making choices in virtual scenarios, and interaction frequency and task contribution in group cooperation. Then, AI uses its own data processing technology and semantic analysis technology to conduct fusion analysis on the collected multi-modal data. Finally, a personalized learning diagnosis report is dynamically generated and fed back to students in a timely manner, helping them clearly understand the advantages and shortcomings of their own learning, and providing students with targeted learning suggestions and improvement measures. Summative evaluation focuses on the comprehensive consideration of learning effects, with the output achievements of students after case-based learning as the core evaluation object. The specific evaluation contents include: the completeness of case analysis reports, the quality of completing virtual scenario tasks, and the problem-solving effect in transfer practice. Based on preset evaluation dimensions and weights, AI automatically scores the achievements and compares them with the average level of students in the same major and at the same level, clarifying the students' relative advantages and shortcomings. Finally, the conclusions obtained from these two evaluation methods are integrated into a comprehensive evaluation report through cross-validation, correlation analysis, comparative analysis, and other methods, providing students with more comprehensive and accurate evaluation feedback.

For example, in the "Professional Ethics" course for the Hotel Management major in secondary vocational education, when teaching revolves around the case of "protecting customers' rights and interests in hotel services", the dual-integrated intelligent evaluation system of "Process + Outcome" plays a crucial role. In the formative evaluation phase, AI records students' learning status via tablet terminals. For instance, regarding students' interpretation of the case "protecting customers' rights and interests in hotel services", this includes data such as the number of clauses related to consumer rights protection from the Tourism Law that they annotated, and their thinking processes for solving problems like "how to balance hotel interests and customers' rights". In the VR-based virtual hotel front desk scenario, AI captures students' operation trajectories when handling customer complaints—such as whether they listened to customers' demands patiently and whether they proposed reasonable solutions in a timely manner. Subsequently, AI conducts fusion analysis on the collected data and generates a personalized learning diagnosis report. A sample report reads: "Your awareness of customers' rights and interests scores 80 points, and your executive ability to solve service problems scores 72 points. Therefore, you have a clear understanding of the importance of protecting customers' rights and interests, but your executive ability needs improvement when practically addressing service issues. It is recommended that you participate in more simulated training for handling service disputes in virtual scenarios." In the summative evaluation phase, the core evaluation object is the "hotel customer service rights protection plan" submitted by students. AI scores the plans based on preset weights: 30% for correctly citing ideological and political theories such as "customer-centricity" and "integrity in service"; 40% for designing standards for protecting customers' rights throughout the entire "check-in - service - check-out" process

in line with hotel management positions; and 30% for proposing innovative measures such as an "intelligent guest room hygiene monitoring system". If a student's plan scores 85 points in the "professional scenario adaptability" dimension (meaning the designed customer rights protection standards align with the actual operation of hotels) but only 58 points in "innovative thinking" (indicating a lack of innovation awareness), the system will note: "The practical plan is in line with reality, but innovation awareness needs to be strengthened", and display a comparison: "Professional scenario adaptability is 9% higher than the average of the same major, while innovative thinking is 8% lower than the average". Finally, the results of the two evaluation methods are comprehensively analyzed to draw a final conclusion. For example, the record of "low executive ability in solving service problems" in formative evaluation and the detailed score deduction in "professional scenario adaptability" in summative evaluation mutually confirm that the student has shortcomings in transforming theories into practical operations. Such conclusions are not only more convincing but also more instructive.

5. Conclusion

This study systematically explores the application of the AI-based "Case Teaching Method" in Ideological and Political Courses of secondary vocational education. The research indicates that the threefold dilemmas of "difficulty in learning", "difficulty for teachers", and "difficulty in teaching" in these courses can be effectively resolved by: constructing an intelligent case resource library with three-dimensional collaboration of "Ideological and Political Education + Major + Industry"; developing a progressive immersive teaching paradigm of "Cognition - Experience - Transfer"; providing trinitarian personalized learning support characterized by "Data-Driven, Precise Response, and Dynamic Adjustment"; and establishing an intelligent evaluation system for the mutual enhancement of "Process & Outcome".This teaching method not only improves the teaching effectiveness of Ideological and Political Courses but also enhances students' professional literacy and comprehensive abilities. Moreover, it provides a practical and feasible path for the innovative development of ideological and political education in secondary vocational education. However, in the process of popularizing and optimizing this teaching method, the following challenges still require attention: first, the sustainability of the in-depth integration of technology and education, which demands further optimization of the adaptability between AI algorithms and teaching objectives; second, the constraints imposed by teachers' digital literacy, which necessitates strengthening the construction of interdisciplinary teaching and research teams and providing training on AI tool application; third, the prevention and control of ethical risks, which requires establishing safety boundaries for case data and a guidance mechanism for values. Therefore, in the future, it is necessary to continuously optimize the adaptability of AI algorithms, improve teachers' digital literacy, and refine the ethical risk prevention and control mechanism, so as to promote the widespread application and continuous improvement of this teaching method.

References

[1] Information on https://www.gov.cn/zhengce/zhengceku/2020-09/29/content_5548106.htm

[2] Xu Yanling: An Analysis on the Construction Strategy of "Integration of Three Elements and Combination of Theory with Practice" in Secondary Vocational Ideological and Political Courses — Taking Philosophy and Life Teaching as an Example, Hua Zhang, Vol. (2024) No. 12, p. 153-155. (In Chinese)

[3] Gao Qiannan, Wu Chengyuan: The Application of Case Teaching Method in the Teaching of Ideological and Political Courses in Higher Vocational Colleges—Taking "Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics" as an

Example,Journal of Yan'an Vocational and Technical College,Vol.39(2025)No.3,p.30-33+44. (In Chinese)

[4] Zhao Han: Regional Research and Reflection on the Integrated Training of Ideological and Political Course Teachers in Primary, Secondary and Tertiary Schools,Journal of China Basic Education,Vol.(2023)No.5,p.58-61. (In Chinese)

[5] Yuan Zuoye: Artificial Intelligence in the Educational Field: Concepts, Crises and Responses—Academic Inquiries and Theoretical Reflections from an International Perspective, Comparative Education Review, Vol.47(2025)No.6, p.51-61. (In Chinese)

[6] Mou Hui, Hao Zhuofan, Chen Jing: A Comparative Study of Case Teaching Methods between China and the United States, Journal of Management Case Studies and Reviews, Vol.14(2021)No.4, p.457-463. (In Chinese)

[7] Ren Xiangjun: Application of AI-based "Case Teaching Method" in the Teaching of Culinary Nutrition and Sanitation, Journal of China Multimedia and Network Teaching (Mid-term), Vol.(2025)No.3, p.74-78. (In Chinese)

[8] Guo Haihong, Zhang Fangning, Zhu Yuqin, et al.: Research on the Effectiveness Evaluation of AI-Enabled Curriculum Ideology and Politics in Agricultural Universities, Modern Business Trade Industry, Vol.(2025)No.17, p.35-37. (In Chinese)