

Research on the Construction and Practice of the Teaching Evaluation System of the Integration of “Post Course Competition Certificate” in Higher Vocational Physical Education Under the Guidance of Ideological and Political Goals

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ABSTRACT To address the mismatch between evaluation methods and vocational standards in higher vocational physical education, this study develops a value-guided teaching evaluation system integrating post requirements, curriculum, competitions, and certifications. First, literature analysis is used to clarify the connotation logic and evaluation dimensions of ideological and political guidance and “post-course-competition-certificate” integration. Second, the Delphi method is applied to establish a multilevel evaluation index system covering five dimensions: value shaping, post adaptation, knowledge construction, competition performance, and qualification certification. Indicator weights are determined using analytic hierarchy process. Third, specific evaluation schemes and tools are designed and implemented in higher vocational physical education courses. Finally, empirical data are collected and analyzed using the certification pass ratio equivalence method. The results show that the system operates collaboratively and stably, with a synchronous completion rate of evaluation tasks reaching 92.7%. Compared with the control class, students in the experimental class show significant improvement in professional awareness and post-related physical fitness, verifying the effectiveness of the evaluation system in promoting comprehensive vocational quality.

INDEX TERMS curriculum ideological education, teaching evaluation, post-course-competition-certificate, vocational physical education, evaluation index system

I. INTRODUCTION

AS the main position for training high-level technical talents for the industry, the reform of curriculum evaluation in higher vocational education plays an important guiding role in implementing the fundamental task of “cultivating morality and talents” and deepening the integration of production and education. This reform aims to align teaching standards with the evolving skill and professionalism demands of the industry, thereby enhancing the quality of talent development. However, the current evaluation of physical education curriculum in higher vocational colleges generally have the following problems: the target orientation is not clear and the problem of training is irrelevant: the evaluation content focuses on the sum of sports skills and physical health assessment, and does not play an effective

role in the specific requirements of physical and professional spirit: the four elements of “post, course, competition and certificate” often appear in a state of “dispersion”: there is no evaluation system taking value shaping as the core and playing a role in integrating multiple goals and achievements into curriculum teaching: the effect of curriculum education is not obvious and difficult to comprehensively promote the sustainable development of students’ comprehensive professional ability [1,2]. Therefore, it has become an urgent thing to promote the deep reform of physical education curriculum in Higher Vocational Colleges and realize its unique role in education to establish a teaching evaluation system with curriculum ideological and political education as the goal, elements coordination and clear guidance.

In recent years, academic circles have carried out exten-

sive research on the theme of “curriculum ideological and political education”, “post course competition certificate”, “teaching evaluation”, etc. Existing research focuses on the mining of factors and path exploration of ideological and political education in physical education curriculum. Its achievements provide an important basis for this study, but speaking generally, most of the existing studies focus on theoretical interpretation or single dimensional practical exploration, and can not systematically and structurally integrate the value leading role of “Ideological and political” with the four elements of “post course competition and certification”. In terms of methodology, as for the construction of evaluation system, most of the common studies use theoretical deduction or experience summary, and there are certain limitations in the objective consensus degree of index selection and the scientificity of weight determination. In order to overcome the above shortcomings, this study plans to adopt the research path of combining Delphi method with analytic hierarchy process [3,4]. Based on this, this study constructs and practices a higher vocational physical education evaluation system that adopts ideological and political goals as a value guide while organically integrating “post-course-competition-certificate” elements tailored to industry vocational standards. This system ensures that the physical education curriculum directly supports the cultivation of the professional ethics and technical agility. This research will adopt the technical route of “top-level design - factor Deconstruction - index establishment - weight assignment - tool development - practical verification”, widely apply the method of policy analysis, expert consultation, hierarchical analysis and teaching experiment, and try to construct an evaluation scheme with complete structure, clear guidance and easy operation, and establish the evaluation system by developing a set of empirical data, aiming to provide a set of systematic solutions and practical experiences to solve the practical dilemma of the evaluation of Higher Vocational Physical Education Curriculum disconnect with goal of education, and help the transformation of the paradigm of Higher Vocational Physical Education Curriculum from “knowledge and skills teaching” to “comprehensive professional quality cultivation”.

II. TOP LEVEL DESIGN AND ELEMENT DECONSTRUCTION OF FUSION EVALUATION

As shown in Figure 1, the “post course competition certificate” integrated teaching evaluation system is constructed under the guidance of Ideological and political goals, and each dimension jointly promotes the development of students’ comprehensive professional quality.

The most important task in building a scientific and reasonable integrated teaching evaluation system is to clarify its core values and logical position. Starting from the basic task of “cultivating morality and cultivating talents”, this paper reviews the relevant policies of national vocational education reform, curriculum-based ideological and political education and school physical education, and clarifies the

top-down design idea of this evaluation system: put forward “ideological and political goals” in the guidance position, make it the main line and soul running through the whole process of integrated elements “job, course, competition and certification”, and try to fundamentally solve the problem of “emphasizing skills but neglecting moral cultivation” in higher vocational physical education evaluation, so that the evaluation activities can play a guiding role in cultivating students’ professional spirit, collective consciousness, rule awareness and willpower from the beginning to the end, and promote the sublimation of physical education evaluation from instrumental rationality to value rationality.

Based on the four ideological and political goals, this study takes the systematization construction of connotations and relationships of the four dimensions of “job, course, competition and certification” as the main thread. Through literature analysis and in-depth interviews with enterprise experts, industry representatives and front-line teachers, the connotation of the four elements have been clarified respectively: “Job” represents the professional physical qualities and the behavior norms of work place. Evaluation should focus on the professional physical qualities and the behavior norms of work place, which are the requirements of actual jobs; “Class” focuses on the knowledge system formed by teaching and transferable motor skills, and attaches importance to the basis for students’ lifelong learning; “Competition” is comprehensive application under high-pressure situation and the manifestation of sportsmanship, which is used as a practice link to cultivate character; “Certificate” represents the qualified skill standards recognized by the industry, and serves as an important basis for the degree of students’ socialization of skills. Job, course, competition and certificate do not exist separately, but form a closed-loop logic of “setting standards based on job requirements, laying the foundation with classes, promoting practice through competitions, and verifying effectiveness with certificates”, and then improve students’ comprehensive quality. Four elements contain ideological and political goals in each link. Job requirements contain professional ethics, course teaching contains value orientation, process of competition contains manifestation of sportsmanship, and obtaining certificate contains social responsibility. The establishment of theoretical model provides basis for the development and practical application of indicator system [5,6].

III. MULTIPLE ROUNDS OF EXPERT CONSULTATION AND INITIAL ESTABLISHMENT OF THE INDICATOR SYSTEM

After the completion of top-level design and element decomposition, in order to make the evaluation indicator scientific, operable and recognized by industries, this study adopted Delphi Method for multiple rounds of expert consultation. The experts from four aspects were carefully calculated to meet the needs of evaluation system from all directions. Finally, 15 experts came from: 3 scholars in the field of vocational education and ideological and political education

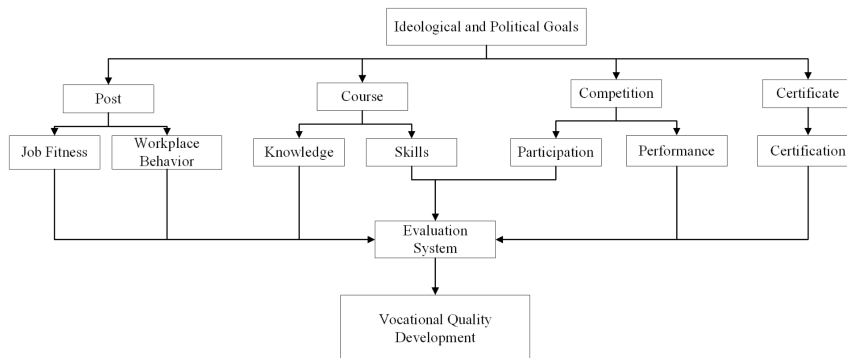


FIGURE 1. Framework Diagram of Integrated Teaching Evaluation System

research, 4 senior human resources managers and technical leaders from cooperative companies, 5 higher vocational physical education teachers with senior titles and guiding experience of provincial-level or higher competitive events, 3 heads of sports industry associations or national-level referees. The above expert structure ensures that the indicators system can absorb wisdom from academic theory, industry demand, teaching practice and industry standards from all directions and make a balanced and reasonable decision [7,8].

The consultation process strictly followed the anonymity, iteration, and feedback principles of the Delphi Method. The first round of consultation involved an open-ended questionnaire, inviting the expert group to freely list specific and observable evaluation points around five pre-set dimensions, including “value shaping (ideological and political education).” After being summarized and organized by the research team, an initial indicator pool containing 48 items was formed. The transition from the initial 48 indicators to the final 32 was achieved through a structured, two-stage screening process in the second Delphi round to ensure objectivity and consensus. First, quantitative criteria were applied: indicators with a mean importance rating below 4.0 or a coefficient of variation (CV) above 0.25 were removed, eliminating 9 items for lacking consensus. Subsequently, a qualitative synthesis was conducted on the remaining 39 indicators, merging 7 items with conceptual overlap into 3 broader ones and removing 3 more due to poor operationalizability or weak alignment with industry standards. This transparent, criteria-driven approach ensured the final set was both highly valued by experts and effectively measurable within the vocational physical education context. Finally, a high degree of consensus was reached, and an evaluation system containing 5 primary dimensions, 10 secondary dimensions and 32 tertiary indicators was established. This system concretizes the ideological and political goals into behavioral indicators such as “complying with the safety regulations of the simulated post”, realizing the key transformation from theoretical conception to measurement tool [9].

IV. DETERMINING THE WEIGHTS OF EVALUATION INDICATORS AND DEVELOPING EVALUATION TOOLS

After initially forming an evaluation system including five levels and thirty-two indicators, the next step to make the evaluation system scientific and rational in actual teaching evaluation was to determine the weights of indicators at each level and developed a feasible evaluation tool accorded with indicators and easy to be operated; This study systematically finished this conversion by widely applying Analytic Hierarchy Process (AHP) and several kinds of educational measurement tool development method. As shown in Figure 3, the system operates through five steps: goal guidance, dimension setting, tool application, data processing, and feedback improvement. This flow makes the evaluation procedure clearer and more operable in teaching practice.

The determination of weights directly affects the guidance of evaluation and the credibility of evaluation results. We used AHP to finish this work. First, based on the designed structure of “goal layer (comprehensive evaluation) – criterion layer (five primary dimensions) – indicator layer (thirty-two specific indicators, i.e., the final tertiary indicators confirmed by the Delphi method),” we developed a special judgment matrix questionnaire and asked experts to finish the designed judgment according to the structure. That is, based on each element in the same level, experts used Satie scale to compared the relative importance to the goal of next higher level one by one. For example, at the criterion layer, experts should finish the compared judgment of the relative importance of “value shaping (ideological and political education)” to “job adaptation (job),” and others, finished all compared judgment. This method also transferred the qualitative experience-based judgment made by experts into compared data that can be used for quantitative analysis.

After finishing the questionnaire collection of all experts, we used the developed analytic hierarchy process (AHP) software Yaahp to input all judgment matrix of experts and calculate and check the consistency of each expert. For the matrix that did not passed the consistency test, we communicated with the corresponding expert and asked him/her to review it clearly to make sure the clear judgment logic. Then, the software used geometric mean method to synthesized the judgment matrix of all valid experts.

Finally, the software calculated the composite weight of all indicators at different levels. Its core framework and composite weight are shown in Table 1.

TABLE 1. Example of the “Job, Course, Competition, and Certification” Integrated Teaching Evaluation Index System and Weights

Primary Indicator (Weight)	Secondary Indicator	Tertiary Observation Points	Weight
A. Value Formation (0.30)	A1. Professionalism	Adherence to rules, teamwork, responsibility	0.12
	A2. Willpower	Overcoming difficulties, striving for progress	0.1
	A3. Sports Morality	Fair competition, respect for opponents and referees	0.08
B. Job Adaptation (0.25)	B1. Physical Fitness	Meeting professional physical fitness test standards	0.15
	B2. Occupational Safety	Mastery of occupational injury prevention and recovery methods	0.1
C. Knowledge & Skills (0.25)	C1. Sports Theory	Understanding of health knowledge and project rules	0.1
	C2. Sports Skills	Achievement level in skill assessment	0.15
D. Competition Performance (0.10)	D1. Competition Participation	Participation in school-level or higher sports competitions	0.04
	D2. Competition Results	Winning competition awards (points assigned by level)	0.06
E. Certification Acquisition (0.10)	E1. Professional Skills Certificate	Acquisition of “1+X” sports-related vocational skills certificate	0.1

Note: The tertiary indicators listed in this table are representative examples. The complete AHP calculation encompassed all 32 final tertiary indicators established in Section 3.

The weighting results show that the weight of “value shaping (ideological and political)” is assigned with the largest value, which reflects that the core principle of the system is ideological and political education; at the same time, the weights of “job adaptation” and “certificate connection” are also significantly larger than the pure skill indicators that dominate in the traditional evaluation, which reflects that the evaluation orientation is clear, that is, evaluation is oriented to professional ability, and assessment is oriented to industry standard. The final weight set provides the accurate mathematical basis for the subsequent quantitative comprehensive evaluation [10].

After determining the weights, the development of evaluation tools intends to turn these abstract indicators into concrete data that can be collected, recorded, and evaluated. We designed a variety of evaluation tools for different indicators. For ideological and political education and professional quality indicators, such as “teamwork” and “fighting spirit,” this paper uses the Likert five-point scoring system and develops a reverse question to control reliability. For behavioral indicators or skill indicators that can be observed and measured, such as “specific job physical fitness standards” and “sports skill specifications,” this paper clarifies the objective description of each performance level to reduce the discrepancy between evaluators. For outcome-based indicators, such as “competition results” and “certificate acquisition,” awards from competitions at different levels and certificates of different types and levels are converted into cumulative and comparable points according to certain rules. Finally, all the output data from all tools are integrated according to the pre-determined weights of indicators using our designed comprehensive evaluation calculation formula, and thus, we get a “Comprehensive Evaluation Report” for each student. This completes the whole loop from indicators to tools and from data to conclusions. To make the implementation path of the system clearer, the operational procedure from indicator allocation to tool application, data

integration, and feedback generation is illustrated in Figure 2.

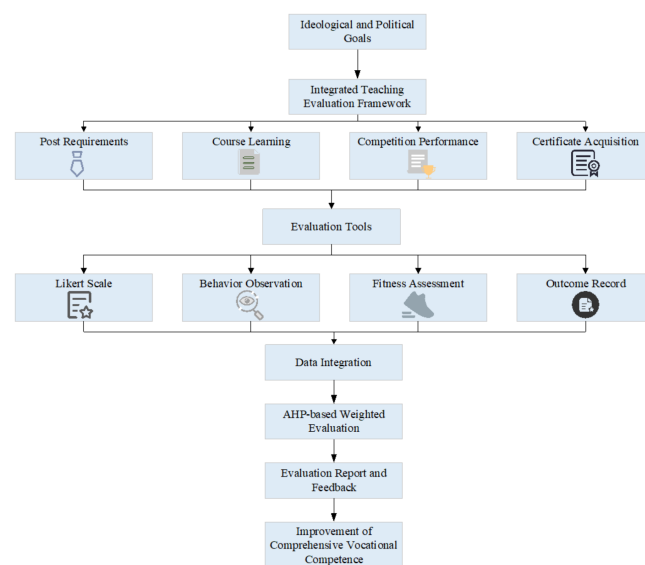


FIGURE 2. Operation flowchart of comprehensive teaching evaluation system under ideological and political guidance

V. ANALYSIS AND COMPREHENSIVE VERIFICATION OF PRACTICAL RESULTS

A. RESEARCH DESIGN AND PARTICIPANTS

To ensure the statistical rigor of the comparative analysis, a quasi-experimental design with a control group was implemented across two pilot higher vocational colleges specializing in programs: College A (a provincial-level demonstrative college) and College B (an industry-focused technical college). The experimental and control groups were formed from parallel classes within the same grade and major (e.g., Modern Technology) to control for institutional and professional backgrounds. A total of 124 students participated in the full-year (2023-2024 academic year) study: the experimental group ($n = 63$, distributed across two classes) received instruction under the new integrated evaluation system, while the control group ($n = 61$, distributed across two classes) followed the traditional physical education curriculum and evaluation methods. Baseline equivalence between the groups was confirmed prior to the intervention through an independent samples t-test on key pre-existing variables. No statistically significant differences ($p > 0.05$) were found in demographic profiles (mean age: 18.5 ± 0.7 years; gender ratio: 72% male), initial physical fitness test scores, or prior academic performance in physical education, establishing a comparable starting point for assessing the intervention's effect.

B. SYSTEM OPERATION EVALUATION AND STABILITY ANALYSIS

To verify the scientific rationality and feasibility of the implemented integrated evaluation system, this study also conducted in-depth monitoring of the operation effect of

the integrated evaluation system in the two pilot schools during the entire teaching period in the 2023-2024 academic year. The evaluation was not directed at the hardware technical parameters, but at the coordination, consistency, and acceptability of the evaluation system. The evaluation contents, methods, and evaluation results of key data are displayed in Table 2 below.

TABLE 2. Core Evaluation Data of the Operational Effectiveness of the Integrated Teaching Evaluation System

Evaluation Dimension	Key Indicator	Calculation Method/Description	Average Value for the Period
System Coordination	Task Synchronization Completion Rate	Proportion of "Post-Training-Competition-Certification" evaluation tasks completed synchronously within the same teaching module	0.927
Data Consistency	Multi-Agent Evaluation Correlation Coefficient	Consistency coefficient of data between teacher evaluations and student self-evaluations on common indicators	0.81
Execution Timeliness	Average Feedback Delay	Average time from evaluation completion to student receiving feedback	2.1 days
Implementation Acceptance	Teacher and Student Satisfaction	Degree of approval for evaluation processes and tools (average score on a 5-minute scale)	4.35 points

Table 2 shows that the integrated evaluation system demonstrated good coordination and stability during operation. The “synchronous completion rate of evaluation tasks” reached 92.7%, proving that the elements of “job training, coursework, competition, and certification” were effectively integrated into the teaching process rather than separated from each other. The “correlation coefficient of multi-subject evaluation” was 0.81, indicating high consistency among data from different evaluation sources and unified standards within the system. The “average delay of evaluation feedback” was controlled at 2.1 days, ensuring the timely incentive and regulatory effects of the evaluation. The high average satisfaction rate of 4.35 among teachers and students further confirms the system’s operability and acceptability from a subjective perspective. This efficient feedback loop was made operationally feasible through a streamlined, technology-supported process designed to minimize administrative burden. Key measures included:

- (1) Utilizing a dedicated digital platform for real-time submission of student self-assessments and teacher evaluations.
- (2) Automating data aggregation for objective metrics (e.g., fitness scores, certificate records) by linking institutional databases.
- (3) Embedding assessment tasks into specific teaching modules to distribute the workload across the semester.
- (4) Automating the calculation of final composite scores based on predefined weights.

This structured approach ensured that the comprehensive evaluation remained manageable within regular teaching duties.

C. COMPARISON OF EDUCATIONAL EFFECTS AND VERIFICATION OF INTEGRATION VALUE

To verify the true effectiveness of the system, we compared the indicators of the main outputs of the experimental class (using integrated evaluation) and control class (using traditional evaluation of physical education) after one year of the

implementation of the experiment. The comparison is made with regard to the main outputs that should be achieved by “ideological and political goal guidance” and “integration of job training, courses, competitions, and certifications.” The results of the comparison are presented in the data shown in Figure 3 below.

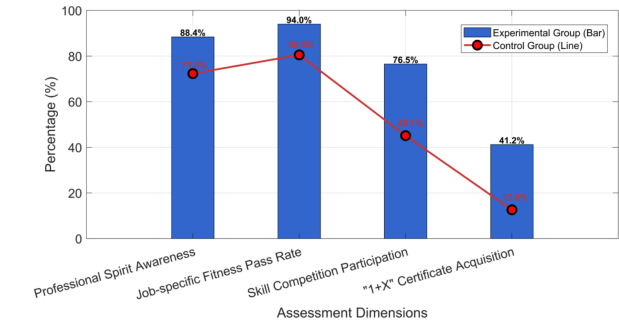


FIGURE 3. Comparison of the effectiveness of core educational indicators between the experimental class and the control class

Comprehensive comparative data shows that the “Integrated Teaching Evaluation System of ‘Job-Oriented Learning, Course-Based Learning, Competition-Based Learning, and Certification’ Guided by Ideological and Political Goals” constructed and implemented by this institute has achieved significant educational effectiveness. The experimental class comprehensively and significantly outperformed the control class in four core indicators: professional spirit awareness, job physical fitness qualification rate, skills competition participation rate, and “1+X” certificate acquisition rate. The “1+X” certificates pursued in this study are not generic but are specifically aligned with the Vocational Skill Level Standards for the Industry issued by the Ministry of Human Resources and Social Security. Certificates such as “Physical Fitness and Safety Management for Positions” were co-developed with leading enterprises in our cooperative consortium, ensuring their curriculum and assessment directly address the physical and safety competency profiles valued by employers. This design-time alignment provides a strong *prima facie* case for their labor market relevance. The “1+X” certificate acquisition rate saw the most outstanding improvement, increasing by a remarkable 227%. This result verifies that the system can effectively address the long-standing core dilemma in higher vocational physical education courses: the superficiality of ideological and political goals and the disconnect between job-oriented learning, course-based learning, competition-based learning, and certification. By taking value shaping as the guiding principle and systematically incorporating job requirements, course teaching, competition results, and certificate standards into the same evaluation framework, this system successfully drives a shift in teaching paradigms. It enables the synergistic development of students’ professional qualities, physical fitness, practical abilities, and employment competitiveness, achieving a paradigm shift from “single

skill evaluation” to “comprehensive educational evaluation.” This provides a feasible key path and practical model for the deep integration of higher vocational physical education courses into the talent cultivation system.

VI. CONCLUSION

This study established an integrated teaching evaluation system for vocational college physical education courses that aligns ideological and political goals with the “post-course-competition-certificate” model tailored to industry standards, verifying its effectiveness in enhancing both professional physical fitness and craftsmanship through teaching practice. Theoretical analysis clarifies the integration path for ideological and political elements into vocational skill development, and practice establishes an operable and quantifiable evaluation system and methods. The results of practice demonstrate that the implementation of this system can effectively improve students’ professional identity, on-the-job physical fitness, and vocational skills certificate pass rate. This study is currently being piloted in some majors of vocational colleges, and its long-term effects and cross-major validity need to be further verified. This study will broaden the verification range by integrating specific vocational scenarios and explore dynamic feedback mechanisms within this system to provide robust support for the reform of physical education in colleges serving the industry. By aligning continuous improvement with the evolving technical demands of production, the framework ensures a more targeted development of vocational physical literacy and teaching quality.

AUTHOR CONTRIBUTIONS

Xiuhong Han designed, collected and analyzed the data, and drafted the manuscript. Xiuhong Han conducted the study, critically revised the manuscript for important intellectual content, and gave final approval of the version to be published. Xiuhong Han 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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REFERENCES

- [1] D. Kang and B. Zhang, “The feasibility of practical vocational education in higher education institutions,” *International Journal of Emerging Technologies in Learning (IJET)*, vol. 17, no. 14, pp. 94-108, 2022, doi: 10.3991/ijet.v17i14.32811.
- [2] C. Cai and P. Huang, “Theoretical Research and Practical Application of Ideological and Political Education Construction of Physical Education Curriculum,” *Frontiers in Sport Research*, vol. 3, no. 1, pp. 10-14, 2021, doi: 10.25236/FSR.2021.030103.
- [3] Jie Wang, “Research on the innovation of physical education curriculum system in higher vocational colleges based on the characteristics of vocational physical fitness,” *Advances in Physical Sciences*, vol. 11, no. 02, pp. 303-307, 2023, doi: 10.12677/aps.2023.112044.
- [4] C. Hu, “Evaluation of physical education classes in colleges and universities using machine learning,” *Soft Computing*, vol. 26, no. 20, pp. 10765-10773, 2022, doi: 10.1007/s00500-022-06983-3.
- [5] M. Xie, “Design of a physical education training system based on an intelligent vision,” *Computer Applications in Engineering Education*, vol. 29, no. 3, pp. 590-602, 2021, doi: 10.1002/cae.22259.
- [6] I. Demchenko, B. Maksymchuk, V. Bilan, et al., “Training future physical education teachers for professional activities under the conditions of inclusive education,” *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, vol. 12, no. 3, pp. 191-213, 2021, doi: 10.18662/brain/12.3/227.
- [7] C. Yanyue, “Research on the Ideological and Political Reform of Curriculum in Vocational Colleges from the Perspective of Integration of Industry and Education,” *education*, vol. 6, no. 24, pp. 148-155, 2023, doi: 10.25236/FER.2023.062424.
- [8] Li Wei, “Research on Teaching Effectiveness of Higher Vocational Physical Education Courses from the Perspective of Ecosystem-Taking Ningxia Vocational and Technical College of Industry and Commerce as an Example,” *Contemporary Sports Science and Technology*, vol. 14, no. 2, pp. 37-40, 2024, doi: 10.16655/j.cnki.2095-2813.2024.02.010.
- [9] S. Guo, “Research on the practical research on the teaching reform of electronic information majors in vocational and technical education under the background of the integration of “post-course competition certificates,”” *Educational and Humanities*, vol. 1, no. 2, pp. 45-53, 2025, doi: 10.63313/EH.9011.
- [10] Zhang Hongyun, Wei Chunsheng, Li Fenghua, et al., “Case teaching practice study on integrating the spirit of Chinese sports into the ideological and political education of higher vocational physical education courses,” *Journal of Beijing Institute of Technology*, vol. 24, no. 1, pp. 90-94, 2025, doi: 10.3969/j.issn.1671-6558.2025.01.019.