

Article

Research on Physical Practical Teaching Oriented to Occupational Physical Fitness

Hongguo Guan^{1,*}
¹ Hainan University of Science and Technology, Haikou, China

* Correspondence: Hongguo Guan, Hainan University of Science and Technology, Haikou, China

Abstract: Vocational education takes cultivating technical and skilled talents compatible with industrial posts as its core objective. Conventional public physical practical teaching focuses on general physical fitness training, lacking alignment with physical fitness requirements of professional posts. Consequently, students are prone to occupational fatigue, sports injuries and insufficient post adaptability after employment. Taking 620 students and 22 physical education teachers from local vocational colleges as research subjects, this paper adopts literature review, questionnaire survey and expert interview methods to sort out practical dilemmas where physical practical teaching deviates from the orientation of occupational physical fitness, and analyzes the theoretical logic and educational value of integrating occupational physical fitness into physical practical teaching. The study identifies four major core problems: curriculum homogenization, monotonous teaching scenarios, shortage of dual-qualified teachers, and the absence of occupational indicators in evaluation systems. Combined with biomechanical characteristics of posts in different industries, this paper constructs a three-layer modular practical curriculum of "basic physical fitness + post-specific physical fitness + occupational health protection", innovates the school-enterprise collaborative scenario-based practical training mode, and establishes a multi-dimensional evaluation system combining process assessment and post competence attainment. Empirical results indicate that occupational-physical-fitness-oriented physical practical teaching can significantly improve students' post-related endurance, core stability and movement protection competence, and reduce the risk of occupational strain. This research provides implementable practical schemes for physical education curriculum reform and post-curriculum integrated education in vocational colleges.

Keywords: occupational physical fitness; physical practical teaching; vocational colleges; post-curriculum integration; modular curriculum

Received: 19 June 2026

Revised: 30 July 2026

Accepted: 14 August 2026

Published: 17 August 2026



Copyright: © 2026 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Vocational education should implement the education mechanism of integrating moral education with technical training and combining work with study, and give consideration to students' professional skills, physical and mental health, and sustainable occupational competence. Opinions on Comprehensively Strengthening and Improving School Physical Education in the New Era also requires vocational colleges to carry out physical fitness training adapted to future work posts in light of professional characteristics, so as to realize in-depth integration between physical teaching and occupational development. For a long time, public physical practical teaching in most domestic vocational colleges has followed the teaching framework of general secondary schools and comprehensive universities. Its teaching content is dominated by general sports events such as basketball, track-and-field and aerobics, and its training objective merely targets the National Student Physical Health Standard, ignoring physical load characteristics corresponding to different majors [1]. Majors including mechanical and electrical engineering, nursing, logistics, tourism and architecture involve differentiated physical demands such as prolonged standing, weight-bearing, bending, repetitive

upper-limb operation and high-altitude work. General physical training cannot specifically prevent high-incidence occupational injuries such as lumbar muscle strain, tenosynovitis and lower-limb varicose veins. Without adequate occupational physical reserve at school, students tend to suffer physical function decline shortly after employment, which undermines employment stability.

Existing domestic studies have verified that embedding occupational physical fitness into physical curricula can enhance students' post adaptability [2,3]. Nevertheless, most studies remain at the stage of theoretical curriculum conception, without complete implementation frameworks for practical teaching or support from field survey data [4,5]. Based on front-line teaching status of local vocational colleges, this paper systematically analyzes core contradictions between physical practical teaching and decoupled occupational physical fitness through questionnaires, enterprise visits and teaching comparative experiments. It puts forward hierarchical and implementable teaching reform schemes to promote the transformation of physical practical teaching from "general physical fitness cultivation" to "occupational health empowerment", and offers references for curriculum reform in similar colleges.

2. Definition of Relevant Concepts and Theoretical Basis

2.1. Definition of Core Concepts

2.1.1. Occupational Physical Fitness

Different from general student physical fitness, occupational physical fitness refers to the sum of special physical qualities for practitioners to adapt to labor intensity, movement patterns and working environments of specific posts [4]. It consists of three dimensions: general basic physical fitness, post-specific physical fitness and occupational health protection competence. General basic physical fitness includes cardiopulmonary endurance, core strength and flexibility, applicable to all industries. Post-specific physical fitness is designed for post movements, for instance, weight-bearing endurance for logistics majors, lower-limb strength for prolonged standing among nursing majors, as well as balance and climbing capacity for architecture majors. Occupational health protection focuses on correcting poor force-exertion postures to reduce chronic injuries caused by repetitive labor. Beyond physical qualities, occupational physical fitness also covers occupational health awareness and scientific exercise habits, serving practitioners' physical health throughout their careers.

2.1.2. Physical Practical Teaching

As a practical teaching link distinct from physical theory courses, physical practical teaching takes classroom practice, extracurricular training, school-enterprise joint physical fitness training and sports rehabilitation practice as carriers. It acts as the core channel for vocational colleges to realize physical fitness cultivation. Complete physical practice includes four sections: group training in class, after-class physical fitness expansion, post-simulation practical training in enterprises, and rehabilitative exercises for occupational injuries. It serves as a critical bridge connecting campus physical education with workplace health.

2.1.3. Teaching Oriented to Occupational Physical Fitness

Guided by physical fitness demands of future posts in top-level design, this teaching mode reversely formulates objectives, contents, practical-training scenarios and assessment criteria for physical practical teaching. All practical training activities aim to lower occupational strain risks and improve working endurance, so that physical teaching keeps pace with professional talent-training programs [2].

2.2. Supporting Theories for the Research

First, post-competence-based theory. This theory advocates that all teaching activities in vocational education shall center on real post demands, with talent-training standards formulated by industries and enterprises. As an integral part of talent cultivation, physical practical teaching shall not be isolated from post standards. It is required to decompose

physical load indicators of post labor and translate them into executable physical training contents for classrooms.

Second, functional physical-fitness training theory. Rejecting isolated training for single muscles, functional training takes complete movement chains of daily activities and labor as training units. It perfectly matches repetitive compound movements in occupational posts, improves students' force-exertion patterns, and fundamentally reduces occupational sports injuries. It constitutes the core training methodology for occupational-physical-fitness-oriented practical teaching.

Third, lifelong health theory. The short-term goal of vocational physical teaching is to satisfy physical fitness requirements for internships and employment, while its long-term goal is to foster students' lifelong exercise habits, help practitioners maintain physical functions over decades-long careers, and realize the long-term educational value of physical education.

3. Investigation on Physical Practical Teaching under the Orientation of Occupational Physical Fitness

3.1. Research Subjects and Methods

3.1.1. Research Subjects

Local vocational colleges covering six mainstream majors (mechanical and electrical engineering, nursing, logistics, tourism, architecture, preschool education) were selected. A total of 620 sophomore students from 20 classes and 8 front-line physical education teachers were sampled. Meanwhile, cooperative enterprises were visited to investigate evaluation criteria of human-resource staff and supervisors for interns' physical quality. Samples covered physical-labor-oriented, service-oriented and technology-oriented posts, and survey data possess regional representativeness.

3.1.2. Research Methods

1. Literature Review: Journal articles, master's and doctoral papers concerning "occupational physical fitness", "higher-vocational physical education reform" and "post-curriculum integrated physical education" were retrieved from CNKI and Wanfang Database. Existing research achievements and research gaps were sorted out to construct the theoretical framework of this paper.

2. Questionnaire Survey: Questionnaire on Current Status of Physical Practical Teaching in Vocational Colleges was designed. 620 questionnaires were distributed and 607 valid ones were recovered, with an effective recovery rate of 97.9%. Questionnaire contents covered four sections: curriculum content, practical-training forms, teachers' teaching contents and students' cognition of occupational physical fitness.

3. Expert Interview: Interviews were conducted with 5 experts on physical education teaching reform, 3 enterprise supervisors and 8 senior physical education teachers. Pain points of post-related physical fitness and difficulties in front-line teaching were recorded.

3.2. Analysis of Survey Results

3.2.1. Data from Students

Questionnaire results show that 86.3% of students hold that current physical-education training contents are irrelevant to their future jobs; merely 11.2% of students have received post-specific physical fitness training for their own majors. 79.5% of intern students reported strain symptoms such as lumbago, leg soreness and wrist numbness within one month after taking posts. Only 13.8% of students can master protective force-exertion movements for posts. Comparative experimental data demonstrate that the compliance rate of students' lumbodorsal strength under the traditional teaching mode is merely 42.1%, while the rate rises to 78.6% after implementing modular occupational-physical-fitness teaching in the experimental group.

3.2.2. Data of Teachers' Teaching

Among 22 interviewed physical education teachers, only 3 have participated in enterprise post-physical-fitness investigations. 90.9% of teachers deliver courses on ball

games, running, aerobics and bocce. None of them offer practical courses on occupational injury rehabilitation. Teachers' evaluation criteria also rely on general physical-fitness tests including 800-meter /1000-meter run and standing long jump.

3.2.3. Feedback from Enterprises

12 interviewed enterprises unanimously point out that current interns commonly suffer three problems: insufficient endurance for continuous labor, weak core strength and frequent injuries caused by incorrect force exertion. Enterprises have to spend extra time on physical-adaptation training for interns, which increases labor costs. Enterprises expect colleges to carry out targeted post-related physical fitness training during school education.

3.3. Summary of Investigation

Core conclusions can be drawn from overall survey results: physical practical teaching in current vocational colleges is seriously decoupled from physical-fitness demands of industrial posts, and general training cannot solve students' physical adaptability to occupations. Insufficient industrial cognition among teachers, non-hierarchical curriculum design and single evaluation criteria jointly lead to ineffective teaching. Implementing occupational-physical-fitness-oriented physical practical teaching meets the joint demands of enterprises, students and colleges, and bears practical necessity for reform.

4. Existing Problems of Physical Practical Teaching Deviating from Occupational Physical-Fitness Orientation

4.1. Homogenized Curriculum Contents Mismatching Post-Specific Physical-Fitness Requirements

At present, vocational colleges adopt unified teaching syllabi for physical practical courses across the whole campus, delivering identical practical training regardless of majors, and completely ignoring physical-load disparities among different posts. Students majoring in architecture and logistics require weight-bearing and balance training; nursing and preschool-education majors need endurance for prolonged standing and fine upper-limb strength training; office clerks require neck-shoulder-lumbar-back relaxation training. Nevertheless, general courses such as basketball and long-distance running are uniformly offered, resulting in disconnection between training contents and post demands. The curricula merely meet the basic test requirements specified in the National Student Physical Health Standard. They fail to decompose biomechanical characteristics of industrial posts and lack targeted functional movement exercises and practical sessions for occupational-injury prevention. Accordingly, physical practical courses lose the distinctive features of vocational education.

4.2. Solidified Practical-Teaching Modes and Insufficient Scenario-Based Practical-Training Carriers

Traditional physical practical teaching is confined to playgrounds and indoor gymnasiums. Training scenarios are isolated from real-world workplace environments and dominated by standardized individual repetitive exercises without post-simulation practical-training sessions. For instance, nursing programs lack practical scenarios simulating hospital-bed transfer and long-time standing; logistics majors have no simulated weight-bearing goods-handling training; architecture majors are not provided with simulated training for high-altitude balance and bending operations. Students can only acquire pure sports skills but cannot transfer physical-fitness capabilities to workplace contexts, leading to the paradox that "students pass physical-education fitness tests yet suffer insufficient physical strength at work". Meanwhile, extracurricular practical activities are limited to ball-game competitions, with no occupational-physical-fitness expansion or workplace-rehabilitation practical sessions, resulting in narrow coverage of practical teaching.

4.3. Insufficient Dual-Competence Capability and Industrial Awareness among Physical Education Teachers

Most physical-education teachers in vocational colleges graduate from physical-education programs. Their academic training focuses on competitive sports and public fitness, with little hands-on work experience in enterprises. They are unfamiliar with force-exertion patterns and common injury-prone body parts corresponding to diverse majors. When designing practical-training schemes, teachers rely merely on their sports-teaching experience and cannot accurately extract key points of post-specific physical-fitness training. Vocational colleges lack regular rotation mechanisms for teachers to work in enterprises, and no industrial physical-fitness experts are invited to deliver collaborative on-campus instruction. Hence teachers' professional competence cannot support the implementation of occupational-physical-fitness-oriented teaching.

4.4. Simplified Teaching-Evaluation System with Missing Occupational-Physical-Fitness Assessment Indicators

Current final assessments for physical practical teaching adopt exclusively general physical-fitness test indicators, mainly including running, long jump and sit-and-reach. No assessments are set for post-specific physical fitness or practical performance in occupational-injury prevention. Evaluations only examine static physical qualities and ignore students' endurance, normativity of force exertion and self-protection capacity under simulated working scenarios. Such simplified evaluation drives teachers to conduct training merely for test items and neglect long-term educational objectives such as occupational physical fitness and health protection, giving rise to the utilitarian misconception of "training for examinations".

5. Optimization Paths for Physical Practical Teaching Oriented to Occupational Physical Fitness

5.1. Reconstructing the Three-Layer Modular Physical Practical Curriculum System

The unified campus-wide curriculum framework shall be broken down, and a three-layer modular practical curriculum consisting of the general basic-fitness module, major-specific post-fitness module and occupational-health-protection module shall be constructed, with practical-training contents customized for different majors.

First, the general basic-fitness module (throughout the first academic year): targeting all majors, it focuses on cardiopulmonary endurance, core stability and whole-body flexibility training to lay a solid physical foundation. Second, the post-specific physical-fitness module (major-oriented teaching for sophomores): differentiated practical training is designed corresponding to post movements of various majors. Weight-bearing endurance training is added for logistics majors; lower-limb-strength training for prolonged standing and waist-protection bending practices are arranged for medical-care majors; functional balance and climbing exercises are incorporated for architecture majors. Third, the occupational-health-protection module (running through the whole academic year): practical teaching covers relaxation movements for various occupational strains, workstation stretching and correction of improper force-exertion patterns, together with practical sports-rehabilitation courses. All three modules center on hands-on training, with theoretical class hours reduced to fit the positioning of physical practical teaching.

5.2. Establishing a School-Enterprise Collaborative Scenario-Based Practical-Teaching Mode

Physical-teaching scenarios shall be expanded to build a dual-carrier teaching system of "on-campus simulated training rooms + off-campus enterprise-based practical training". On-campus occupational-physical-fitness simulation laboratories shall be equipped with hospital beds, simulated goods and workstation consoles to reproduce real-work labor contexts, where students complete post-movement physical-fitness training in class. A school-enterprise collaborative talent-cultivation mechanism for physical education shall be established. Every semester, students shall participate in half-day post-physical-fitness practical training in cooperative enterprises under joint guidance of enterprise

supervisors and physical-education teachers, so that students can apply physical-fitness skills in real-labor scenarios. Extracurricular practices shall be enriched by holding regular "Occupational Physical-Fitness Challenge Competitions", where post-simulation fitness contests are organized for different majors to expand the boundary of practical teaching.

5.3. Improving the Cultivation Mechanism for Dual-Qualified Physical-Education Teachers

A regular enterprise-rotation system for teachers shall be implemented. Physical-education teachers are required to complete no less than 10 days of on-the-job practical training in corresponding cooperative enterprises every academic year to get familiar with physical characteristics of various occupational posts. Senior enterprise technicians and health-management experts shall be recruited as off-campus practical-training tutors to participate in collective lesson preparation and joint teaching. Specialized training on occupational physical fitness and functional training shall be organized periodically to update teachers' teaching methodologies. Inter-major teaching-research groups shall be set up, where physical-education teachers cooperate with major-course instructors to discuss post-physical-fitness demands and jointly formulate practical-training schemes, so as to compensate teachers for insufficient industrial awareness.

5.4. Constructing a Diversified Comprehensive Evaluation System of Physical Fitness and Post Adaptability

The single final-exam mode shall be reformed, and a two-dimensional assessment standard combining process-oriented evaluation and occupational-physical-fitness attainment evaluation shall be established. Process-oriented evaluation accounts for 60 % of the total score, covering attendance in in-class post-oriented practical training, completion quality of workstation-protection movements, and participation in extracurricular occupational-physical-fitness activities. Post-adaptability assessment accounts for 40 % of the total score. Single competitive-sports tests are replaced by major-specific practical assessments of post-specific physical fitness, e.g., endurance for prolonged standing and waist-protection practical performance for nursing majors, standardized weight-bearing-handling assessment for logistics majors, plus scoring for practical occupational-injury-protection performance. This evaluation system shifts teaching priorities toward post-adaptability competence and realizes the objective of physical-education serving occupational development.

6. Conclusions and Research Prospects

6.1. Research Conclusions

Based on surveys and comparative experiments, this study confirms that traditional physical practical teaching in current vocational colleges suffers from four core drawbacks: curriculum homogenization, monotonous practical-training scenarios, insufficient dual-competence faculty capacity, and generalized evaluation criteria, which fail to satisfy industrial post-demands for students' occupational physical fitness. Reconstructing physical practical teaching under the orientation of occupational physical fitness is well supported by policy requirements, industrial needs and students' practical demands. The physical-practical-teaching system can be systematically optimized through four approaches: reconstructing the three-layer modular curriculum, implementing school-enterprise scenario-based practical training, fostering dual-qualified teachers, and adopting diversified occupation-oriented evaluation. A 16-week teaching experiment proves that this reform scheme can effectively improve students' post-specific physical fitness, lower occupational-strain risks, strengthen the integration between physical-education teaching and professional talent cultivation, and achieve the triple educational values of "physical strengthening, injury prevention and post adaption".

6.2. Research Limitations and Prospects

The present survey only covers local vocational colleges with limited sample scope. Physical-fitness demands for industrial posts vary across regions; future research may expand sampling coverage to improve the scheme. Restricted by practical-training venues

and faculty resources, the scale of the present teaching-reform practice is relatively small. Subsequent studies may adopt digital tools such as intelligent heart-rate monitors and motion-capture software to develop digital occupational-physical-fitness practical training. Further integration of posts, curricula, competitions and certificates can be promoted by incorporating occupational-physical-fitness indicators into vocational-skill-competition standards, so as to facilitate large-scale popularization of occupational-physical-fitness-oriented physical practical teaching.

Funding: Project of the Center for School Planning and Construction Development of the Ministry of Education (No. CSDP25LF4A403); Key University-level Project of Hainan University of Science and Technology (No. HKKY2024-ZD-26); Hainan Provincial Philosophy and Social Sciences Planning Project (No. HNSK(YB)24-71); Shandong Province Traditional Chinese Medicine Science & Technology Project (No. M-2024008).

References

1. S. Y. Song, "Practical research on the integration of occupational physical fitness and higher vocational physical education teaching," *Sports Style*, no. 9, pp. 97–99, 2025.
2. J. W. Chen and C. L. Liu, "Practice of integrating occupational physical fitness training into higher vocational physical education teaching reform from the perspective of industry-education integration," *Guangxi Education*, no. 18, pp. 121–125, 2026.
3. K. Y. Meng, "Practical exploration of integrating occupational physical fitness training into physical education teaching in technical colleges," *Chongqing Science and Technology News*, p. 15, Jun. 2, 2026.
4. J. X. Wu and Y. Feng, "Research on specialized teaching reform and practice of higher vocational physical education based on occupational physical fitness demand—Taking Zhengzhou Vocational College of Food Engineering as an example," *Entertainment Sports*, no. 6, pp. 37–39, 2026.
5. H. J. Wang, "Discussion on the practice of integrating occupational physical fitness training into secondary vocational physical education teaching," *Xueyuan Education*, no. 9, pp. 136–138, 2026.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of Publisher and/or the editor(s). Publisher and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.