



Improving physical education quality at Hanoi metropolitan university: A research on solutions

Manh – Duong Bui, Huu – Trung Do

Faculty of Physical Education, National Defense and Security Education, Hanoi Metropolitan University, Vietnam

Abstract

Background: In the context of the knowledge economy and the Fourth Industrial Revolution, increasing dependence on technology and machinery has led to sedentary lifestyles and a significant decline in physical fitness, particularly among university students—the nation's future workforce. Hanoi Metropolitan University (HMU) faces substantial challenges in ensuring comprehensive educational quality. While Physical Education (PE) plays a pivotal role, it is currently hindered by limited facilities, low student engagement, and inflexible pedagogical methods.

Methods: The study combined conventional scientific research methods: document analysis, a status quo survey using questionnaires distributed to 1,249 students, in-depth interviews with 17 experts and lecturers, and pedagogical tests evaluating six physical fitness criteria according to the standards of the Ministry of Education and Training.

Objectives: This research aims to systematically and comprehensively evaluate the current state of PE teaching and learning at HMU. Based on these findings, the study developed, selected, and experimentally applied a system of six solutions to innovate teaching methods, thereby enhancing training quality and improving students' physical foundations.

Results: The situational analysis revealed that facilities met only 40-50% of quality requirements, while student physical fitness especially endurance was low (approximately 36-37%). The study proposed six solutions, which were highly rated by experts for their feasibility (mean Likert scores ranging from 4.47 to 4.88). Experimental results indicated that both physical fitness indices and academic performance significantly improved following the implementation of these solutions, with statistical significance at $P < 0.05$.

Conclusions: The synchronized application of solutions ranging from shifting perceptions and individualizing the teaching process to integrating technology and motor games represents an effective approach to enhancing the quality of Physical Education at Hanoi Metropolitan University.

Keywords: Physical education, solutions, teaching quality, students, hanoi metropolitan university

Introduction

The sustainable development of a nation depends not only on its economic potential or technological advancement but also on the quality of its human resources, developed comprehensively in both intellect and physical health. Within the higher education system, Physical Education (PE) is more than just training motor skills; it is an organic component of cultural education, contributing to character formation, the promotion of healthy lifestyles, and a sense of responsibility toward personal and communal health. Vietnam's educational development strategy consistently emphasizes the role of PE as a vital activity to ensure the holistic development of students, meeting the demands of industrialization, modernization, and national defense.

Hanoi Metropolitan University (HMU), as a high-quality multidisciplinary training institution under the Hanoi People's Committee, has been vigorously implementing educational reforms focused on learner-centered competency development. The university identifies PE as a crucial task aimed at equipping students with health management knowledge, basic motor skills, and the habit of lifelong physical activity. However, the current practice of PE at the university faces numerous challenges. The explosion of information technology and social media has led students to spend more time on sedentary activities, resulting in physical inactivity and a decline in essential physical attributes. A significant portion of the student body perceives PE merely as a mandatory requirement, participating with a passive mindset and lacking positive motivation.

In addition to subjective factors from learners, objective conditions regarding teaching environments present certain barriers. Despite the university's investments, the infrastructure, sports facilities, and training equipment remain disproportionate to the increasing scale of enrollment. Many training grounds have degraded, and multipurpose gymnasiums lack synchronization, which restricts the implementation of modern pedagogical methods and complicates extracurricular activities. The faculty, though highly qualified and dedicated, still struggles to find new approaches to stimulate interest and address the individual differences in physical condition and ability among students.

The need to reform PE at HMU toward modernization, individualization, and the integration of information technology has become more urgent than ever. Researching solutions to enhance the quality of PE teaching not only improves students' health foundations but also contributes to the overall training efficiency of the university, preparing students with a robust physical foundation for a competitive labor market. This study focuses on an in-depth analysis of the current situation from multiple perspectives faculty, facilities, curriculum, and students' actual physical fitness levels thereby proposing a synchronized system of solutions with high scientific and practical value.

Materials and Methods

To achieve the research objectives, a logical research process was implemented, utilizing a variety of scientific methods to ensure the accuracy and objectivity of the

collected data. The study was conducted at the training facilities of Hanoi Metropolitan University (HMU) during the 2023-2024 and 2024-2025 academic years.

Participants and Research Subjects

The primary subject of this research is the Physical Education (PE) teaching and learning process for non-specialized students at HMU. The survey and experimental samples included:

1,249 full-time students from various training courses, selected using a stratified random sampling method: 34% first-year, 33% second-year, and 33% third-year students.

20 full-time PE lecturers from the university and 17 experts and administrators who participated in the validation of the proposed solutions.

Specific Research Methods

Document Analysis and Synthesis: Legal documents on PE in higher education from the Ministry of Education and Training, scientific research related to innovative sports pedagogy, and annual HMU reports regarding enrollment scale, personnel, and infrastructure were analyzed.

Interviews and Expert Workshops: Structured interview forms were used to gather opinions from administrators and PE experts on the necessity and feasibility of the proposed solutions. A 5-point Likert scale was applied to quantify the evaluations, where scores from 4.21 to 5.00 were categorized as “Strongly Agree/Highly Feasible”.

Questionnaire Survey: Questionnaires were administered to collect data on students' perceptions, attitudes, satisfaction levels, and learning motivations toward PE. Evaluation criteria included the perceived necessity of the subject, satisfaction with facilities, and the demand for elective sports.

Pedagogical Testing (Physical Fitness Tests): To assess students' physical fitness levels, the study utilized six

standardized tests prescribed by the Ministry of Education and Training (2008):

Test 1: Dominant handgrip strength (kg) – to assess upper limb strength.

Test 2: Sit-ups (repetitions/30 seconds) – to assess abdominal muscular endurance.

Test 3: Standing long jump (cm) – to assess lower limb explosive power.

Test 4: 30m standing start sprint (seconds) – to assess speed.

Test 5: 4x10m shuttle run (seconds) – to assess agility.

Test 6: 5-minute optional run (meters) – to assess cardiovascular and respiratory endurance.

Pedagogical Experiment: An experimental teaching program incorporating the new solutions was conducted with an experimental group and compared against a control group following the traditional curriculum to evaluate effectiveness.

Statistical Analysis: Data were processed using specialized statistical software. Key parameters included the arithmetic mean \bar{x} , standard deviation (SD), percentage (%), and Student's t-test to evaluate differences between groups with a significance level of $P < 0.05$.

Results

Based on the practical survey conducted at Hanoi Metropolitan University (HMU), the research results have clarified the comprehensive landscape of Physical Education (PE) activities, from input factors to the final output, which is the physical fitness level of the students.

Current Status of Faculty and Infrastructure Resources The PE faculty at HMU is currently stable in terms of structure but is under significant pressure due to the large scale of the student body. Statistical data indicates a concerted effort toward enhancing the professional qualifications of the teaching staff.

Table 1: Characteristics of the Physical Education Faculty at HMU (2023-2024)

No.	Evaluation Indicators	Quantity (n)	Percentage (%)
1	Total full-time faculty	16	100.0
2	Gender structure		
	- Male	11	68.75
	- Female	5	31.25
3	Academic qualifications		
	- PhD	5	31.25
	- Master's degree	11	68.75
4	Years of experience (Seniority)		
	- Over 10 years	13	81.25
	- Under 10 years	3	18.75
5	Tỷ lệ phục vụ sinh viên	1/625	-

Source: Results from the practical survey.

Regarding infrastructure, this is the most significant "bottleneck" in enhancing teaching quality. Although the training grounds occupy a certain scale, the overall quality and the geographical dispersion across four campuses present numerous challenges.

Table 2: Current Status of Training Grounds and Sports Equipment

Asset Category	Existing Scale	Technical Status
Training Area	20,000 m ²	40-50% meet depreciation standards
Mini Football Pitches	02 pitches	Degraded turf, poor drainage system
Volleyball Courts	04 courts	Cement surface, cracked and damaged
Badminton/Table Tennis Courts	05 courts	Maintain average standards
Multi-purpose Gymnasiums	03 halls	Undergoing upgrades
Equipment (Various balls)	250 units	Sufficient for 30 students per class

Source: University infrastructure status report.

Current Status of Student Perception and Physical Fitness Levels

The perception survey indicates that students hold a relatively positive view regarding the role of Physical

Education (PE). However, there remains a significant gap between their awareness and the voluntary commitment to regular physical training.

Table 3: Student Perception of the Importance of Physical Education (n = 1,249)

Perception Level	Quantity (n)	Percentage (%)
Very Essential	296	23.7
Essential	459	36.7
Neutral / Normal	385	30.9
Unessential	107	8.6
Completely Unessential	2	0.1

Source: Results from the questionnaire survey.

Regarding physical fitness status, the test results reveal critical gaps in endurance and speed, whereas upper and lower limb strength reached a more favorable level.

Table 4: Results of Student Physical Fitness Indices Based on Training Standards

Test Content	Gender	Pass (%)	Fail (%)	Remarks
Dominant handgrip strength	Male	70.8	29.2	Good
	Female	66.2	33.8	Average
Standing long jump	Male	78.5	21.5	Good
	Female	75.4	24.6	Good
30m standing start sprint	Male	50.3	49.7	Average
	Female	49.2	50.8	Poor
5-minute optional run	Male	38.0	62.0	Very Poor
	Female	36.4	63.6	Very Poor

Source: Synthesized data from pedagogical testing.

Furthermore, data regarding students' Body Mass Index (BMI) provided noteworthy insights: 28% of surveyed students fell into the overweight or obese category, while nearly 20% were classified as underweight. This indicates a significant imbalance between nutrition and physical activity, posing a major challenge in designing individualized exercise protocols tailored to each student's needs.

Proposed Solutions for Quality Improvement

By analyzing existing shortcomings and consulting with experts, a system of six solution groups was developed and validated. These solutions aim for a comprehensive innovation ranging from perception and curriculum content to pedagogical methods and assessment frameworks.

Table 5: Expert Evaluation of the Necessity and Feasibility of the Proposed Solutions (n = 17)

Proposed Solutions	Mean Score (M)	Coefficient of Variation (CV%)	Classification
Solution 1: Enhancing communication and awareness education	4.76	3.5	Highly Feasible
Solution 2: Application of visual-aided methods	4.70	4.2	Highly Feasible
Solution 3: Differentiated and individualized instruction	4.88	2.8	Highly Feasible
Solution 4: Motor games and competitive activities	4.47	6.1	Feasible
Solution 5: Progressive overload training	4.58	5.3	Feasible
Solution 6: Innovating assessment and evaluation	4.64	4.7	Feasible

Source: Results of expert consultation.

Discussion

The interaction between current situational factors and the effectiveness of the proposed solutions provides deep insight into the roadmap for enhancing Physical Education (PE) quality at Hanoi Metropolitan University (HMU). Analyzing these results moves beyond mere statistics, aiming to understand the psycho-physiological mechanisms underlying these pedagogical interventions.

Analysis of the Link Between Lifestyle and Physical Decline

Data in Table IV reveals a paradox: HMU students possess acceptable muscular strength but exhibit a severe deficit in cardiovascular and respiratory endurance (with only 36% meeting requirements). This can be explained through the mechanism of biological adaptation. Explosive power (e.g., standing long jump) is a quality primarily dependent on

neurological factors and muscle structure, whereas endurance requires continuous, systematic training and a robust oxidative system within muscle cells. A sedentary lifestyle, with an average of 8 hours per day spent in stationary activities, has weakened the body's oxygen transport system.

Furthermore, the fact that 28% of students face BMI-related issues (overweight/obese) further exacerbates their inability to perform endurance exercises. Excess body weight exerts pressure on the musculoskeletal system and causes the heart rate to rise faster than normal during physical exertion, leading to rapid fatigue and psychological aversion to exercise. This explains why "Differentiated and Individualized Instruction" (Solution 3) received the highest consensus (4.88 points). Lecturers cannot apply the same 5-minute running intensity to a student with a normal BMI and one with Grade 1 obesity. Adjusting the training load to

fit each individual not only ensures safety but also empowers students to achieve their goals, thereby maintaining motivation.

Impact of Demand-Driven Training Programs

Comparing the general curriculum with demand-driven programs reveals a positive shift. When students choose subjects based on their interests (e.g., Football, Tennis, Swimming, Traditional Martial Arts, or Yoga), the rate of “Good” and “Excellent” grades increases significantly (from 23.3% to 28.1%). Self-determined motivation is the key to the learning process. According to Self-Determination Theory (SDT), when learners feel they have autonomy (choice) and competence, they tend to exert more effort and achieve better outcomes.

However, reality at HMU shows that 80% of students opt for demand-driven programs, placing immense pressure on the already degraded infrastructure (Table II). The concentration of students in popular sports like Football or Badminton leads to high density on the courts, reducing actual practice time for individuals. This suggests that quality improvement must involve not only pedagogical innovation but also a synchronized roadmap for infrastructure upgrades.

Detailed Evaluation of Innovation Solutions

Solution 1: Enhancing Awareness through Multimedia Communication: This is the foundational solution. Instead of dry theoretical lectures on the importance of sports, lecturers should connect with reality through workshops, sports bulletins, and online health knowledge competitions. Collaborating with the Youth Union to integrate physical activities into anniversaries and experiential trips helps students perceive PE as a part of a healthy lifestyle “culture” rather than just a credit-earning subject.

Solution 2: Visual Methods and Technology Integration: In the digital age, students habitually process information via images and videos. Utilizing technical model clips and video analysis of incorrect movements helps students rapidly form a “motor representation” in the brain. Lecturers can use smartphone applications to record student performances for immediate comparison with standard models. This “immediate feedback” method is exceptionally effective for correcting technical errors.

Solution 3: Differentiated and Individualized Instruction: Based on initial physical and health assessments, lecturers should divide classes into small groups based on ability or health status. Gifted students can be assigned advanced tasks or act as teaching assistants. Students with health issues (e.g., high BMI or mild chronic conditions) require specific supplementary exercises with carefully graduated intensity. This reflects a humanistic approach to education, ensuring “no one is left behind” in physical training.

Solution 4: Motor Games and Competitions: Sports psychology indicates that arousal (excitation) is a key factor in motor skill acquisition. Transforming monotonous physical drills into small competitions or competitive motor games changes the classroom atmosphere. Students become engrossed in the game, momentarily forgetting the fatigue of high-intensity exercise. This environment also fosters teamwork, discipline, and sportsmanship.

Solution 5: Progressive Overload Training: To improve fitness indices (especially endurance), the body must be placed in a state of “controlled overload.” Lecturers must plan a gradual increase in difficulty, intensity, and volume week by week. Cardiovascular and respiratory adaptations only occur when physical stimuli are strong enough to disrupt the body’s previous homeostasis. However, this progression must strictly adhere to safety principles.

Solution 6: Innovating Assessment and Evaluation: Assessment should shift from “summative evaluation” (final results) to “formative assessment” (the process). PE grades should encompass: attendance, active participation, personal physical improvement relative to the start of the term, and technical test results. Transparent criteria and peer-assessment encourage accountability and help students identify specific areas for improvement.

Analysis of the Feasibility and Sustainability of the Solutions

The proposed solutions do not require an immediate massive financial investment but rather focus on changing the methodology and organizational structure of teaching. This is particularly suitable for the university's budget, which is currently spread across multiple development goals. The sustainability of these solutions lies in the creation of a PE “ecosystem”, where students learn not only on the field but also through digital resources, self-training in clubs, and a fair evaluation system.

Nevertheless, for these solutions to have a long-term impact, the university must remain committed to its 2030 Development Plan, in which infrastructure upgrading is a prerequisite. When multi-purpose gymnasiums are completed and sports fields are renovated, these new pedagogical solutions will have a solid foundation to flourish.

Conclusion

Through the process of analyzing the current situation and developing solutions to improve the quality of Physical Education (PE) teaching for students at Hanoi Metropolitan University, the following conclusions and recommendations can be drawn:

Firstly, the current quality of PE at the university is characterized by a conflict between the students' demand for innovation and the existing infrastructural constraints. While students maintain a correct perception of the subject's importance, their physical fitness levels particularly in endurance and speed are at a worryingly low level. The prevalence of overweight status and sedentary lifestyles represent significant barriers affecting both the academic performance and overall health of the student body.

Secondly, the demand-driven training model is a correct strategic direction, aligning with modern higher education trends. However, its effectiveness is currently limited by the shortage of training grounds and the degradation of equipment. The overcrowding at specialized training facilities necessitates an urgent and synchronized roadmap for infrastructure upgrading by the university.

Thirdly, the system of six proposed solutions is comprehensive and highly feasible, receiving strong consensus from experts and faculty members. The practical application of these solutions in teaching has initially yielded positive transformations in both students' physical

fitness indices and their learning attitudes. In particular, solutions related to individualized instruction and the application of visual technology have effectively addressed challenges concerning differences in physical condition and limited classroom time.

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