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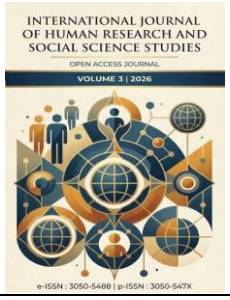

Assessing the Current State of Scientific Research at Universities of Physical Education and Sports in the Context of Digital Transformation

Ngo Xuan Duc[1], Prof. Dr. Le Ngoc Hung[2]

[1]Phd candidate,University of Education - Vietnam National University, Hanoi

[2]Vietnam National University, Hanoi

ABSTRACT: Scientific research constitutes a fundamental mission of higher education institutions. In the context of robust digital transformation across all social sectors, an objective assessment of the current state of scientific activities at universities of physical education and sports is essential. Such an evaluation identifies achieved results, existing limitations, and the specific factors influencing research effectiveness within a digital environment. These findings serve as a critical framework for proposing tailored solutions aimed at enhancing research quality, fostering innovation capacity, and meeting the evolving demands of higher education in the modern era**.**

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Ngo Xuan Duc

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1. INTRODUCTION

In the context of the vigorous digital transformation occurring throughout the higher education system, researching the current state of scientific activities at physical education and sports universities is of urgent significance, both theoretically and practically. These institutions are tasked with training physical education teachers and specialized sports personnel for society, while also playing a pivotal role in promoting applied research in physical education, sports coaching, healthcare, and comprehensive human development.

However, amidst the demands for university governance reform, innovation in training methods, and international integration, scientific research activities at these institutions face numerous challenges. These include uneven digital literacy among staff, incomplete technological infrastructure, traditional research organization methods, and limited utilization of data and digital tools.

Conducting a situational analysis will help objectively identify achieved results, existing limitations, and the factors influencing the efficiency of scientific research in a digital environment. On this basis, appropriate solutions can be proposed to enhance research quality, strengthen innovation capacity, and meet the developmental requirements of higher education in the new era.

2. RESEARCH METHODOLOGY

- **Study Design:** Cross-sectional descriptive study
- **Study Period:** From June 2023 to April 2024.
- **Sampling Method:** Convenience sampling.
- **Research Content:** The survey questionnaire regarding the current state of scientific research activities at physical education and sports universities in the context of digital transformation consists of the following components:

+ Demographic Information: (Year of birth, gender, workplace, position, educational level).

+ Situational Analysis of Scientific Research Activities: The relationship between scientific research, training, and community service; objectives of research activities; research content; organizational processes; and research outcomes

+ Situational Analysis of Scientific Research Activities: The relationship between scientific research, training, and community service; objectives of research activities; research content; organizational processes; and research outcomes.

- Data Collection Methods: Data were collected using a survey questionnaire via **Google Forms**, utilizing a combination of online and face-to-face methods. Respondents answered questions covering the following key areas: General information of respondents; Objectives and content of scientific research activities; The role of scientific research; Opportunities and challenges in research activities; The current state of scientific research activities, measured using a **5-point Likert scale** depending on the specific criteria. Data Analysis: Data are presented as percentages, means, and frequencies. The results were processed using EpiData and SPSS version 22.0.

3. RESEARCH RESULTS

3.1. The relationship between scientific research, training, and community service

Training, scientific research, and community service are the three fundamental functions that maintain an organic relationship within universities. Scientific research provides the theoretical and practical foundations for innovating instructional content and methods, thereby enhancing training quality and enabling faculty to update their professional knowledge. Simultaneously, the training process supplies a young, dynamic human resource pool for research activities, particularly through postgraduate programs. Integrating research with training helps learners develop critical thinking, investigation, and problem-solving skills, while also improving the quality of textbooks and lectures.

Furthermore, research outcomes contribute to enhancing the academic prestige, competitive positioning, and international rankings of universities. Beyond the ivory tower, scientific activities play a crucial role in knowledge and technology transfer to serve the community and drive socio-economic development. In the era of digital transformation, technologies such as AI, Big Data, and IoT create favorable conditions for lecturers and researchers to implement highly applicable scientific projects.

However, the survey indicates that gathering feedback from stakeholders—especially enterprises, employers, and alumni—regarding community service activities has not been conducted regularly or comprehensively. This highlights the urgent need to strengthen the university-society nexus to enhance the effectiveness of scientific research in alignment with training and community service.

3.2. Objectives of scientific research activities at physical education and sports universities

Scientific research activities in universities aim to generate new knowledge, contributing to the development of science, technology, and innovation, while simultaneously serving socio-economic development and improving the quality of human resources. Within higher education, scientific research is one of the core functions of institutions, closely integrated with training and community service (Law on Higher Education, 2018).

Through scientific research, lecturers and learners are provided with opportunities to access new knowledge, enhance professional expertise, and develop **scientific mindset** and problem-solving abilities. These factors contribute to the innovation of instructional content and methods, thereby elevating training quality (UNESCO, 2015). Concurrently, scientific research produces scholarly outputs such as journal articles, research projects, patents, and practical technological solutions, which enhance the **academic prestige** and standing of higher education institutions (World Bank, 2020).

Furthermore, scientific research is inextricably linked to the university's function of social engagement and community service, contributing to the transfer of knowledge and technology to address practical societal issues (Ministry of Education and Training, 2017). In summary, the objective of scientific research in universities is not only oriented toward knowledge advancement but also toward improving training quality, fostering innovation, and increasing the institution's contribution to society.

3.3. Content of scientific research activities in universities within the context of digital transformation

Scientific research is a systematic process of creative inquiry and discovery aimed at uncovering the nature and laws of natural or social phenomena, or developing innovative solutions. This activity is grounded in empirical evidence and follows rigorous procedures to generate new knowledge and improve practical applications. The scope of this concept is broad, encompassing the research process, research outcomes, application of findings, and technology transfer. According to John W. Creswell (2014) in "Educational Research," scientific research in universities is primarily implemented through three approaches: quantitative, qualitative, and mixed methods.

The survey results regarding the content of scientific research activities are presented in Table 1.

Table 1. Survey results of lecturers on the content of scientific research activities at physical education and sports universities

No.	Criteria	Mean Score
1	Conducting scientific research projects at all levels	4.37
2	Preparing scientific reports	4.28
3	Writing papers for scientific conferences/workshops	4.27
4	Writing articles for scientific journals	4.08
5	Supervising students' scientific research projects	4.11
6	Attending scientific conferences/workshops	3.98
7	Compiling textbooks and monographs	4.06

8	Self-researching professional content for lectures	3.91
9	Supervising undergraduate theses	3.9
10	Writing articles for scientific knowledge dissemination	3.89
11	Supervising Master's theses	3.84
12	Supervising Doctoral dissertations	3.82

The survey results on lecturers' perceptions of scientific research indicate that the most highly rated activities include: Conducting scientific research projects at all levels (4.37); Preparing scientific reports (4.28); Writing papers for scientific conferences/workshops (4.27); Supervising students' research projects (4.11); and Writing articles for scientific journals (4.08). Other activities received ratings ranging from 3.82 to 3.98.

3.4. Current state of scientific research outcomes at physical education and sports universities

3.4.1. Current state of scientific publication quantity

According to statistics from 2020 to 2024, the total number of scientific articles published in specialized domestic and international journals and conference proceedings by physical education and sports universities was 822. Of these, 142 articles were published in international journals and conference proceedings, while 680 were published in domestic ones. The quantity and average quality of scientific publications in specialized domestic and international journals/proceedings have increased, with an average of 164.6 articles per year.

Table 2. Number of scientific articles published over a 5-year period

No.	**University**	**Years**										**Total**
		2020		2021		2022		2023		2024		
		Int'l	Dom.	**Int'l**	Dom.	**Int'l**	Dom.	**Int'l**	Dom.	**Int'l**	Dom.	
1	Hanoi University of Physical Education and Sports	9	76	51	77	10	89	6	75	2	59	454
2	Ho Chi Minh City University of Physical Education and Sports	18	43	11	76	14	44	1	75	22	66	369
	Tổng cộng											823

Among the international publications, the number of articles published in prestigious journals indexed in ISI/Scopus is presented in Table 3.

Table 3. Number of articles published in ISI/Scopus journals over 5 years

TT	Trường	Years					Total
		2020	2021	2022	2023	2024	
1	Hanoi University of Physical Education and Sports	1	1	4	3	4	11
2	Ho Chi Minh City University of Physical Education and Sports	1	2	1	1	2	7
							18

The results from the tables show that there are 18-20 scientific articles published in prestigious international journals within the ISI/Scopus database. Based on these statistics, the number of publications in high-impact international journals remains low. In reality, the research fields of physical education and sports universities have favorable directions for international publication, such as Physical Education, Sports Science, Sports Medicine, and Educational Sciences. However, interdisciplinary scientific fields require high-precision research equipment systems, such as Semi-motion, InBody, and MetaMax 3B, which necessitate significant financial investment. Therefore, to increase the number of scientific publications in prestigious international journals, physical education and sports universities need appropriate management measures to foster research activities.

3.4.2. Number of completed and approved scientific research projects

The number of scientific research projects completed and approved over the last five years (2020–2024) is summarized in Table 4.

Table 4. Number of faculty research projects over 5 years

TT	University	Number										Total
		2020		2021		2022		2023		2024		
		M	U	M	U	M	U	M	U	M	U	
1	Hanoi University of Physical Education and Sports	1	10	3	7	2	3	2	3	2	4	37
2	Ho Chi Minh City University of Physical Education and Sports	0	0	0	4	0	0	0	1	0	5	10
	Total											**47**

**Note: M: Ministerial level; U: University level*

The results in the table indicate that over the five-year period, the number of faculty research projects remains relatively modest for university institutions (37 and 10, respectively). Furthermore, the number of National and Ministerial-level projects at physical education and sports universities is limited; specifically, there have been no National-level projects, and one institution recorded no Ministerial-level projects within this timeframe.

Table 5. Student scientific research activities over 5 years

TT	Nội dung	Years				
		2020	2021	2022	2023	2024
	Hanoi University of Physical Education and Sports					
1	University-level student conference reports	11	0	10	19	17
2	National-level student conference reports	03	0	02	02	02
3	Number of students participating in research	23	0	47	57	53
	Ho Chi Minh City University of Physical Education and Sports					
1	University-level student conference reports	10	0	8	3	8
2	National-level student conference reports	1	0	0	5	2
3	Number of students participating in research	19	0	10	4	12

Table 6. Number of student scientific research awards over 5 years

No.	Awards	Year				
		2020	2021	2022	2023	2024
	Hanoi University of Physical Education and Sports					
1	First Prize	1	0	1	1	1
2	Second Prize	1	0	2	2	2
3	Third Prize	2	0	3	3	3
4	Consolation Prize	2	0	4	13	4
	Ho Chi Minh City University of Physical Education and Sports					
1	First Prize	0	0	0	0	0
2	Second Prize	1	0	1	2	1
3	Third Prize	1	0	1	0	1
4	Euréka Award	1	0	1	0	0
5	Consolation Prize	2	0	2	0	0
Total						

Regarding student scientific research: physical education and sports universities have shown commitment by organizing university-level student research conferences and nominating students for the National Student Scientific Conference in the field of physical education and sports. Notably, in 2025, there are two projects participating in the Euréka Award. However, there have been no projects participating in the Science and Technology Award for Young Faculty and Students in higher education institutions.

3.4.3. Number of Published Textbooks

The statistics for textbooks and monographs published over the five-year period are presented in Table 7.

Table 7. Number of published textbooks and monographs

No.	University	Years					Total
		2020	2021	2022	2023	2024	
1	Hanoi University of Physical Education and Sports	2	0	0	6	10	18
2	Ho Chi Minh City University of Physical Education and Sports	11	7	8	9	0	45
		13	7	8	15	10	**63**

Table 7 shows that from 2020 to 2024, a total of 63 textbooks, monographs, and reference materials were published by physical education and sports universities. Specifically, Hanoi University of Physical Education and Sports published 18 units, while Ho Chi Minh City University of Physical Education and Sports published 45. These results indicate that the output of textbooks and monographs has met the internal training requirements of the institutions. However, the overall quantity derived from scientific research activities remains relatively modest, necessitating management measures to enhance the quality and efficiency of research outputs.

3.4.4. Funding for Scientific Research Activities

The expenditure for scientific research is detailed in Table 8.

Table 8. Statistics of scientific research funding at physical education and sports universities

(Unit: Million VND)

No.	University	Năm					Tổng cộng
		2020	2021	2022	2023	2024	
1	Hanoi University of Physical Education and Sports	1,733.0	2,252.3	2,369.0	2,514.2	2,969.5	11,838.0
2	Ho Chi Minh City University of Physical Education and Sports	210	260	179	180	180	1,014.0
	Total						12,852.0

The data in Table 8 indicates that physical education and sports universities have significantly prioritized research funding (12.852 billion VND). However, discussions with university leadership reveal that this total expenditure includes funds from Ministerial-level projects, textbook compilation, and researcher salaries. The actual budget allocated specifically for institutional-level projects and core research activities remains limited and fails to meet the 5% minimum requirement as stipulated in Decree 109/ND-CP regarding science and technology activities in higher education institutions.

3.5. Current Status of Research Personnel in Universities

Scientific research at these universities has produced significant works contributing to training and community service, such as a comprehensive system of high-quality textbooks and lectures. Additionally, research products have addressed practical socio-economic needs through Ministerial-level projects focusing on physical education issues across vast regions (Northern Midlands and Mountains, Red River Delta, and suburban Hanoi).

The universities have fostered a favorable environment by providing time and facilities for faculty, alongside offering professional development opportunities (short-term training, PhD programs). Systems for administrative procedures, such as project registration and liquidation forms, have been streamlined. These incentive policies have nurtured a passion for research among lecturers, aligning with the universities' strategic orientations.

However, research activities still face limitations in both quality and quantity relative to the status of a university. While teaching and research are the two primary functions of faculty, in practice, a disproportionate amount of time is dedicated to teaching, with many lecturers exceeding the standard load by over 200 hours. The volume of publications in prestigious international databases (ISI/Scopus) remains low (approximately 3.4 articles/year for both institutions).

At the 2017 conference on "Science and Technology Development in Higher Education," the Minister of Education and Training emphasized that mechanisms to attract faculty to research are not yet sufficiently effective. A significant bottleneck is that while research should be a core mission, many lecturers—especially younger ones—focus predominantly on teaching, treating research as a "compliance" task (e.g., publishing only to fulfill minimum requirements).

Faculty Demographics and Capacity:

- **Total Faculty:** 213 lecturers (Hanoi & HCMC).
- **PhD Holders:** 19.24%.
- **Master's Holders:** 80.75%.
- **Student-to-Faculty Ratio:** 14:1.

Despite this potential, research remains fragmented and lacks breakthrough contributions. Survey data shows that nearly **60%** of lecturers have no international publications, and only 1.2% have more than 5 articles in ISI/Scopus journals. Over 20% of managers and faculty have never attended a national or international conference, highlighting a gap in international integration. Furthermore, over 90% of respondents agree that the research budget is still insufficient.

Currently, under Circular 20/2020/TT-BGDĐT, faculty are required to spend 1/3 of their total working time (approx. 586 hours/year) on research. In reality, most focus on their teaching quotas and neglect their research obligations, often hindered by limited foreign language proficiency.

4. CONCLUSION

Scientific research activities at physical education and sports universities maintain an organic relationship with training and community service, in which research plays a central role in enhancing training quality, advancing knowledge, and contributing to socio-economic development. In the era of digital transformation, technological advancements such as Artificial Intelligence (AI), Big Data, and the Internet of Things (IoT) have opened numerous opportunities for implementing applied and interdisciplinary research. Survey results indicate that scientific research at these institutions has achieved certain milestones, evidenced by the increasing number of scientific publications, research projects, textbooks, and dedicated investment budgets. Simultaneously, universities have gradually established incentive mechanisms and a favorable environment to encourage faculty and students to engage in research.

However, relative to the potential and stature of higher education institutions, scientific research activities still face several limitations. These include a low volume of international publications, a limited number of Ministerial and National-level projects, a research budget that does not yet meet developmental requirements, and the absence of strong, established research groups. Furthermore, faculty participation remains uneven due to heavy teaching loads, limited foreign language proficiency, and gaps in research skills among a segment of the staff. The linkage between universities and enterprises, local authorities, and other stakeholders for research implementation and community service has not been effectively exploited.

In conclusion, strengthening the management and development of scientific research—closely integrated with training and community service while leveraging the opportunities of digital transformation—is an urgent requirement for physical education and sports universities today. This necessitates that higher education institutions develop long-term scientific research strategies, increase resource investment, enhance research staff capacity, and expand domestic and international cooperation. Such efforts will elevate research quality, academic prestige, and the institutions' contribution to the development of physical education and society.

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