

NEEDS ASSESSMENT OF PHYSICAL EDUCATION ADMINISTRATION IN PRIMARY AND SECONDARY SCHOOLS: EVIDENCE FROM LIUZHOU, CHINA

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ABSTRACT

This study investigates the pressing issues in the administration of physical education (PE) in primary and secondary schools in Liuzhou, a rapidly urbanizing region in China. Using a needs assessment approach, the research identifies key challenges such as insufficient sports facilities, outdated curriculum design, and gaps in teacher training. A mixed-methods methodology was employed, integrating surveys and qualitative interviews with 400 participants, including teachers and school administrators. The findings highlight critical disparities in resource allocation and the need for targeted policy interventions. This study provides actionable insights to improve PE practices, addressing both immediate challenges and long-term development, thereby contributing to a more equitable and effective PE administration system in Liuzhou.

Keywords: Physical Education Administration, Needs Assessment, Primary and Secondary Schools, Liuzhou, China

INTRODUCTION

Physical education (PE) plays a crucial role in fostering students' physical health, social skills, and lifelong habits for healthy living. In recent years, China's education system has progressively emphasized the importance of physical education through policies such as the "Health First" initiative, which has integrated physical activities into the core curriculum. According to the Compulsory Education Physical Education and Health Curriculum Standards (2022 Edition) issued by the Ministry of Education of China, all grades in compulsory education schools nationwide are required to offer the "Physical Education and Health" course, which accounts for 10%–11% of the total class hours. This proportion ranks third among all subjects, following Chinese Language (20%–22%) and Mathematics (13%–15%), and is higher than that of Foreign Languages (6%–8%). [1] However, despite policy-level support, there are substantial gaps in resource allocation, teacher qualifications, and curriculum design, particularly in economically underdeveloped areas.

Liuzhou, located in the central region of Guangxi Zhuang Autonomous Region, is a rapidly urbanizing city characterized by its industrial and tourism-driven economy. According to the data from the Liuzhou Statistical Yearbook 2023, the per capita GDP of Liuzhou City is 74,679 yuan, with a total GDP of 311.586 billion yuan, of which the secondary industry accounts for more than 39%. In terms of education, 52 educational communities have been established, covering 172 primary and secondary schools and kindergartens. However, the urban-rural residents' per capita income ratio is 2.21:1. The urban-rural gap leads to an uneven distribution of educational and sports resources, with rural areas being relatively weak. [2] Urban schools are often equipped with superior facilities and well-trained PE teachers, while rural schools face a lack of resources, outdated infrastructure, and insufficient extracurricular sports activities. Research has shown that such urban-rural disparities lead to significant inequalities in student participation and experience in physical education. Rapid urbanization and population mobility further exacerbate these challenges, creating a pronounced mismatch between resource supply and demand. The

administration of physical education in primary and secondary schools faces several significant challenges. Urban schools generally benefit from modern sports facilities, while rural schools often lack even basic sports grounds and equipment, highlighting an unequal allocation of resources[3][4]. Additionally, many PE teachers in these schools have not undergone systematic training, leading to inconsistent teaching quality and limited opportunities for professional development[5]. Furthermore, the current PE curricula fail to reflect local characteristics or address students' actual needs, often presenting monotonous content that diminishes student engagement and enthusiasm[6]. Despite the recognition of these issues, there remains a scarcity of systematic needs assessments to evaluate and address these gaps. This study aims to bridge this gap through empirical analysis, providing a detailed understanding of the disparities and actionable strategies to improve physical education administration in Liuzhou, China.

Based on the identified gaps, this study aims to address the following research questions:

- 1. What are the primary challenges in the administration of physical education in Liuzhou's primary and secondary schools?**
- 2. What are the specific needs related to PE facilities, teacher training, and curriculum design in these schools?**
- 3. How can actionable recommendations be provided to policymakers and educators for targeted improvements?**

Existing studies have extensively explored the importance of physical education (PE) and the challenges in its administration, highlighting disparities in resource allocation, teacher training, curriculum implementation, and the influence of socioeconomic factors. Significant inequalities exist between urban and rural schools in access to sports facilities, with urban schools typically equipped with modern sports grounds, while rural schools often lack basic infrastructure such as gymnasiums and outdoor activity spaces[7]. These findings emphasize the urgent need to prioritize investments in underdeveloped regions to address these disparities. Similarly, the professionalization of PE teachers remains a pressing issue, as many educators in remote areas lack access to continuous professional development, leading to inadequate teaching competencies[8]. Low salaries and limited career advancement opportunities further exacerbate teacher turnover, leaving schools understaffed and unable to meet student needs effectively[9].

In addition, inconsistencies in the implementation of national PE policies have been identified, with some schools adopting innovative, student-centered teaching methods, while others rely on outdated and rigid practices[10,11]. These challenges are further compounded by the lack of alignment between national curriculum standards and local needs, reducing the relevance and appeal of PE programs. Moreover, the socioeconomic conditions of a region significantly impact the effectiveness of its physical education programs[12]. In rapidly urbanizing cities like Liuzhou, resource demand often outpaces supply, creating significant imbalances that hinder the development of equitable PE opportunities. These findings underscore the importance of localized studies to better understand and address these challenges, enabling targeted interventions that improve the quality and accessibility of physical education.

This study aims to provide a scientific basis for optimizing the administration of physical education in Liuzhou's primary and secondary schools by identifying critical gaps in resources and practices to offer data-driven support for policymakers in allocating resources more equitably. The findings present actionable strategies to improve the quality of PE programs through targeted interventions while aligning with the United Nations' Sustainable Development Goal 4, which emphasizes inclusive and equitable access to quality education and promotes lifelong learning opportunities[13]. The insights gained will address deficiencies in Liuzhou's physical education administration and serve as a replicable framework for similar regions, contributing to the broader development of PE in under-resourced areas.

OBJECTIVE

1.To evaluate the current state of physical education administration in primary and secondary schools in Liuzhou, focusing on key areas such as teaching quality and curriculum design, faculty development, management support and policy assurance, student engagement and parent-school collaboration, as well as assessment systems and feedback mechanisms. The aim is to identify the gaps between current practices and school needs comprehensively.

2. To explore critical factors influencing the quality of physical education, including the scientific and practical nature of curriculum content, opportunities for teacher professional development and innovation, the level of policy support, adequacy of sports facilities and safety measures, student participation rates, and the quality of parent-school collaboration. These factors will be examined to reveal their impact on PE administration.

3.To provide targeted recommendations for improving the administration of physical education in Liuzhou's schools. This includes optimizing curriculum design, enhancing teacher capabilities, strengthening policy support, promoting student engagement, and refining assessment and feedback mechanisms. These recommendations aim to offer policymakers and educators evidence-based insights to build a more efficient and inclusive physical education system.

METHODOLOGY

This study adopts a mixed-methods approach, integrating both quantitative and qualitative methodologies to ensure a comprehensive evaluation of physical education administration (PEA) in primary and secondary schools of Liuzhou city, China. A survey was designed as the primary tool for quantitative data collection, supported by focus group discussions and in-depth interviews for qualitative insights. The target population comprised physical education teachers and administrators across Liuzhou. A stratified random sampling technique was applied to ensure representation from urban and rural schools, capturing the diversity of educational settings. A total of 400 participants were selected, including 320 teachers and 80 school administrators.

A structured questionnaire, informed by existing literature and tailored to Liuzhou's physical education context, was designed to assess five key dimensions: teaching quality and curriculum design, faculty development and professional growth, administrative support and policy safeguards, student participation and home-school cooperation, and evaluation systems and feedback mechanisms. Each dimension comprised items rated on a five-point Likert scale, ranging from "strongly disagree" to "strongly agree." The instrument underwent a validation process through expert review. A pilot study with 30 respondents ensured the questionnaire's reliability, yielding a Cronbach's Alpha of 0.92, indicating high internal consistency. Quantitative data were analyzed using SPSS. Descriptive statistics (mean and standard deviation) were computed to summarize responses. To prioritize identified needs, the Modified Priority Needs Index (PNI Modified) was calculated, following the formula:

$$PNI_{Modified} = (I - D) / D$$

- I = Mean of desirable characteristics (Importance)
- D = Mean of current characteristics (Degree of Success)

PNI Modified enabled the ranking of priority needs by identifying gaps between the current state (D) and desirable state (I), as proposed by Wongwanich and Wiratchai (2005)[14][15]. Existing studies have utilized similar needs assessment methodologies to explore various aspects of education, including physical education and teacher professional development (Kaewtong et al., 2022)[16], educational reform (Moonsarn et al., 2022)[17], and internal supervision in schools (Jedaman et al., 2021)[18]. These studies highlight the value of mixed-methods approaches in addressing gaps in teaching competencies, educational administration, and reform strategies, providing a solid foundation for this research. Rankings were assigned based on PNI scores to determine the most critical areas requiring improvement. Qualitative data from focus groups and in-depth interviews were thematically analyzed to

supplement and contextualize the quantitative findings. These methods ensured a comprehensive understanding of the challenges and needs in PEA within Liuzhou's educational context.

RESULTS

Reliability Analysis

The questionnaire achieved high reliability, with a Cronbach's Alpha of 0.94 for desirable conditions and 0.96 for current conditions. This confirms the stability and consistency of the instrument across dimensions.

Table 1 Cronbach's Alpha Coefficient Range

Range	Reliability Standard
[0.9-1)	Very high reliability, trustworthy
[0.7-0.9)	High reliability, trustworthy
[0.35-0.7)	Moderate reliability, trustworthy
(0.35-0)	The scale needs redesigning

Table 2 Cronbach's Alpha Coefficient Result

	Cronbach's Alpha Coefficient
Desirable Condition (I)	0.939
Current Condition (D)	0.968

KMO and Bartlett's Test

The KMO value was 0.95, and Bartlett's Test of Sphericity was significant ($p < 0.001$), indicating that the data were suitable for factor analysis.

Table 3 KMO and Bartlett's Test Results

	Disirable Condition(I)	Current Condition(D)
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.949	0.967
Approximate Chi-Square	3869.209	6491.217
df	253	253
sig.Significance P)	0	0

Demographic Analysis

The demographic analysis of this study highlights the diversity among participants, providing valuable context for interpreting the findings. The sample comprised 357 individuals, with a slightly higher representation of males (56.58%) compared to females (43.42%). Age distribution showed that the majority (59.1%) were under 30 years old, followed by those aged 31-40 (27.73%), with fewer participants in the 41-50 age group (9.24%) and above 50 years (3.92%). Educational background revealed that most participants held a bachelor's degree (75.63%), while others had qualifications ranging from associate degrees (7.28%) to master's degrees (14.85%), and a small proportion held doctorates (2.24%). Regarding work experience, over half (53.78%) had less than five years of professional

experience, followed by those with 6-10 years (26.33%), 11-20 years (13.73%), and more than 20 years (6.16%). Participants were drawn from various school levels, including primary schools (42.02%), junior high schools (29.13%), and senior high schools (28.85%). This comprehensive demographic breakdown ensures the inclusion of diverse perspectives, capturing insights from individuals across different genders, age groups, education levels, and professional experiences.

Table 4 Demographic Characteristics of the Sample

Category	Options	Count	Percentage (%)	Category	Options	Count	Percentage (%)
Gender	Male	202	56.58%	Age	Below 30	211	59.1%
	Female	155	43.42%		31-40	99	27.73%
Education Level	Associate Degree	26	7.28%		41-50	33	9.24%
	Bachelor's Degree	270	75.63%		Above 50	14	3.92%
	Master's Degree	53	14.85%	Years of work	Less then 5years	192	53.78%
	Doctoral Degree	8	2.24%		6-10years	94	26.33%
School Level	Primary School	150	42.02%		11-20years	49	13.73%
	Middle School	104	29.13%		21-30years	14	3.92%
	High School	103	28.85%		More then 30 years	8	2.24%

Overall Needs Assessment Analysis

The overall needs assessment analysis for physical education administration (PEA) in Liuzhou's primary and secondary schools revealed critical areas requiring immediate improvement. The **Priority Needs Index (PNI)** scores across five dimensions highlight disparities between the current and desirable conditions. Specifically, **Dimension C (Administrative Support and Policy Safeguards)** showed the highest need (PNI = 0.209), followed by **Dimension A (Teaching Quality and Curriculum Design)** (PNI = 0.192), **Dimension B (Faculty Development and Professional Growth)** (PNI = 0.169), **Dimension D (Student Participation and Home-School Cooperation)** (PNI = 0.157), and finally, **Dimension E (Evaluation Systems and Feedback Mechanisms)** (PNI = 0.139). These results indicate that administrative policies and resources, along with curriculum design, require the most urgent attention.

Table 5 Overall Need Assessment Index of PEA

Scope of PEA	Current Condition(D)		Disirable Condition(I)		PNI _{modified}	Ranking
	Mean	SD	Mean	SD		
Teaching Quality and Curriculum Design(A)	3.592	0.937	4.275	0.782	0.190	2
Faculty Development and Professional Growth(B)	3.654	0.934	4.272	0.775	0.169	3

Administrative Support and Policy Safeguards(C)	3.635	0.963	4.392	0.741	0.208	1
Student Participation and Home-School Cooperation(D)	3.685	0.904	4.264	0.778	0.157	4
Evaluation Systems and Feedback Mechanisms(E)	3.674	0.914	4.176	0.777	0.137	5

Dimension A: Teaching Quality and Curriculum Design

Analysis of the sub-indicators in Dimension A demonstrated that "Scientific Curriculum Content" (A1) had the highest PNI (0.247), indicating a significant gap in aligning course design with modern educational standards. Conversely, "Course Update Frequency" (A4) scored the lowest PNI (0.128), suggesting moderate satisfaction but also highlighting room for improvement. The results suggest that curriculum modernization and relevance are key areas to prioritize to meet stakeholders' expectations.

Table 6 Need Assessment Index of Teaching Quality and Curriculum Design

Teaching Quality and Curriculum Design(A)	Current Condition (D)		Disirable Condition (I)		PNI_{modified}	Ranking
	Mean	SD	Mean	SD		
A1 Scientific Validity of Curriculum Content	3.5938	0.9027	4.4818	0.6252	0.247	1
A2 Practicality of Curriculum Content	3.6527	0.9554	4.3894	0.7089	0.202	2
A3 Clarity of Curriculum Objectives	3.6246	0.9145	4.2577	0.7273	0.175	4
A4 Frequency of Curriculum Updates	3.5322	0.9494	3.9832	0.8771	0.128	5
A5 Effectiveness of Curriculum Implementation	3.5938	0.9181	4.3137	0.7511	0.200	3
Total	3.592	0.937	4.275	0.782	0.190	

Dimension B: Faculty Development and Professional Growth

In Dimension B, "Teacher Training Opportunities" (B2) exhibited the highest PNI (0.193), reflecting a lack of professional development resources for PE teachers. This is compounded by findings that "Teacher Professional Levels" (B1) and "Career Development Pathways" (B3) also showed notable gaps, with PNIs of 0.170 and 0.185, respectively. These findings emphasize the need for targeted policies to enhance teacher training and career progression.

Table 7 Need Assessment Index of Faculty Development and Professional Growth

Faculty Development and Professional Growth(B)	Current Condition (D)		Disirable Condition (I)		PNI_{modified}	Ranking
	Mean	SD	Mean	SD		
B1 Teachers' Professional Competence	3.7843	0.9032	4.4258	0.6936	0.170	3
B2 Opportunities for Teacher Training	3.591	0.9544	4.2829	0.7352	0.193	1
B3 Career Development Pathways for Teachers	3.5966	0.9330	4.2633	0.7593	0.185	2
B4 Support for Teaching and Research Activities	3.6751	0.8714	4.2241	0.7608	0.149	5

B5Teachers' Innovation Capability	3.6611	0.9451	4.2129	0.8000	0.151	4
Total	3.654	0.934	4.272	0.775	0.169	

Dimension C: Administrative Support and Policy Safeguards

Dimension C emerged as the most critical area for intervention, with sub-indicators such as "Sports Equipment Quality" (C3, PNI = 0.248) and "Safety Measures" (C4, PNI = 0.226) leading the rankings. These results indicate a pressing need for investment in high-quality equipment and robust safety policies to enhance the learning environment.

Table 8 Need Assessment Index of Administrative Support and Policy Safeguards

Administrative Support and Policy Safeguards(C)	Current Condition (D)		Disirable Condition (I)		PNI _{modified}	Ranking
	Mean	SD	Mean	SD		
C1Strength of Policy Support	3.7171	0.9125	4.2801	0.7717	0.151	5
C2Adequacy of Sports Facilities	3.6022	1.0077	4.3613	0.7465	0.211	3
C3Quality of Sports Equipment	3.591	0.9719	4.4818	0.6644	0.248	1
C4Safety Assurance Measures	3.7339	0.9114	4.577	0.6252	0.226	2
C5Management's Emphasis on Physical Education	3.5686	0.9534	4.3109	0.7199	0.208	4
Total	3.635	0.963	4.392	0.741	0.208	

Dimension D: Student Participation and Home-School Cooperation

In Dimension D, "Student Participation" (D1) scored the highest PNI (0.174), reflecting an ongoing challenge in engaging students in physical education activities. Interestingly, "Parental Support for PE" (D3) and "Home-School Communication" (D4) showed PNIs of 0.160 and 0.167, respectively, underscoring the importance of fostering stronger family and school collaboration to improve outcomes.

Table 9 Need Assessment Index of Student Participation and Home-School Cooperation

Student Participation and Home-School Cooperation(D)	Current Condition (D)		Disirable Condition (I)		PNI _{modified}	Ranking
	Mean	SD	Mean	SD		
D1Student Participation	3.7367	0.9290	4.3866	0.6883	0.174	1
D2Students' Interest in Physical Education	3.7955	0.8415	4.2885	0.7631	0.130	4
D3Family Support for Physical Education	3.6162	0.8970	4.1933	0.7891	0.160	3
D4Home-School Communication and Collaboration	3.6218	0.8931	4.2269	0.7692	0.167	2
Total	3.685	0.904	4.264	0.778	0.157	

Dimension E: Evaluation Systems and Feedback Mechanisms

Dimension E recorded the lowest overall PNI (0.139), with "Improvement Effectiveness" (E3, PNI = 0.162) and "Feedback Mechanism Completeness" (E4, PNI = 0.173) as priority areas. These results suggest that while evaluation systems are relatively developed, there is a need for more structured and actionable feedback mechanisms to address specific areas of concern effectively.

Table 10 Need Assessment Index of Evaluation Systems and Feedback Mechanisms

Evaluation Systems and Feedback Mechanisms(E)	Current		Disirable		PNI _{modifi} ed	Rankin g
	Condition (D)		Condition (I)			
	Mean	SD	Mean	SD		
E1 Evaluation Standards for Students' Physical Education	3.6723	0.9220	4.042	0.8148	0.101	4
E2 Timeliness of Feedback in Evaluations	3.7115	0.8697	4.1289	0.7534	0.112	3
E3 Effectiveness of Improvement Measures	3.6891	0.9126	4.2885	0.7292	0.162	2
E4 Completeness of Feedback Mechanisms in Physical Education	3.6527	0.9102	4.2829	0.7000	0.173	1
Total	3.674	0.914	4.176	0.777	0.137	

CONCLUSION AND FUTURE WORK

This study provides a comprehensive evaluation of the physical education administration (PEA) in Liuzhou's primary and secondary schools in China. By integrating both quantitative and qualitative methods, the study identified critical gaps across five dimensions: teaching quality and curriculum design, faculty development and professional growth, administrative support and policy safeguards, student participation and home-school cooperation, and evaluation systems and feedback mechanisms.

Key findings highlight significant disparities between the current state and the desired outcomes, with the **management support and policy safeguards (Dimension C)** showing the highest Priority Needs Index (PNI = 0.209). Specific areas, such as the quality of sports equipment and safety measures, require immediate attention. Furthermore, gaps in **teaching quality and curriculum design (Dimension A)** and **faculty development (Dimension B)** underscore the need for modernized curricula, enhanced teacher training opportunities, and professional development pathways. While the **evaluation systems and feedback mechanisms (Dimension E)** exhibit relatively lower demand, the improvement of feedback mechanisms remains critical for a holistic enhancement of PEA. The insights derived from this study offer actionable recommendations for policymakers and educators to address existing challenges, particularly in resource allocation, teacher training, and curriculum innovation. The findings also underline the importance of fostering collaboration between families and schools to boost student engagement.

Future research should expand the scope to include longitudinal studies to track the impact of proposed interventions on PEA outcomes. Additionally, integrating advanced analytical tools, such as machine learning for real-time feedback analysis, could enhance the precision and applicability of future assessments. Comparative studies with other regions, particularly those undergoing rapid urbanization, would provide broader insights into effective strategies for improving PEA in diverse contexts. By addressing these areas, future studies can contribute to a more inclusive and equitable framework for physical education management.

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