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Research on Learning Satisfaction in Public Physical Education Courses at Higher Education Institutions

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Abstract

This study investigates students' satisfaction with public physical education courses at higher education institutions, aiming to understand their overall evaluations and the factors that influence them. Drawing on domestic and international literature, we designed a questionnaire encompassing four dimensions—teaching staff quality, course content, instructional organization, and facility infrastructure—and collected 500 valid responses from five universities. Descriptive statistics were used to analyze respondents' demographic characteristics and satisfaction distributions. Reliability and validity of the scale were assessed via Cronbach's α and exploratory/confirmatory factor analyses. Group differences by gender, year level, and major were examined through t-tests and one-way ANOVA, and a multiple linear regression model was employed to explore the effects of each dimension on overall satisfaction. Findings indicate that overall satisfaction is above average, with significant differences across gender, year level, and major. Teaching staff quality, course content and organization, and facility conditions all have significant positive impacts on satisfaction. This research provides empirical support for reforming and enhancing public physical education courses, recommending improvements in faculty training, course design, and facilities to further enrich students' learning experiences and course quality.

Keywords: higher education, public physical education, learning satisfaction, questionnaire survey

1. Introduction

Against the backdrop of China's Healthy China strategy, public physical education courses in universities serve not only as a primary means of enhancing students' physical fitness but also as a vital platform for fostering lifelong sports awareness. Despite significant investments in faculty development, curriculum reform, and facility upgrades, students' subjective satisfaction with these courses varies widely. Existing studies often focus on individual factors or single-institution samples, lacking systematic, large-scale, cross-regional evaluations. To address this gap, the present study adopts the SERVQUAL service quality model to construct four evaluation dimensions—teaching staff quality, course content, instructional organization, and facility infrastructure. Using 500 valid questionnaires from five universities, we employ descriptive statistics, reliability and validity testing, group difference analyses, and multiple regression modeling to reveal each dimension's relative contribution to student satisfaction and how these effects are moderated by year level and major. Our goal is to provide actionable, evidence-based recommendations to help universities optimize resource allocation, enhance course experiences, and guide future instructional reforms[1].

2. Literature Review

2.1 Status of Research on Satisfaction with Public Physical Education Courses

In recent years, scholars both at home and abroad have increasingly focused on students' satisfaction with university physical education courses. International research tends to center on student-centered teaching approaches, highlighting the roles of course diversity, personalized instruction, and classroom interaction. For example, Smith et al. (2018) surveyed ten U.S. universities and found that high-quality teacher–student interaction and innovative course content significantly boost student satisfaction. In Europe, researchers emphasize facility conditions and dynamic feedback mechanisms, demonstrating that well-planned venues and timely evaluations promote greater participation and satisfaction[2]. Domestically, studies commonly employ questionnaires to examine four key dimensions: teaching staff quality, course design, assessment systems, and facility conditions. Zhang Hua (2020) analyzed over 400 responses from five provincial universities and determined that faculty expertise and organization of course activities have the greatest impact on satisfaction. Li Ming et al. (2021) added

"student interest in physical activities" as a variable, showing that interest-driven curriculum design can significantly elevate overall satisfaction. Although some research explores how factors like gender, year level, and major moderate satisfaction, most remain at the level of single-factor tests or descriptive analysis, lacking support from multivariate regression or structural equation modeling. Overall, the existing literature offers valuable multi-dimensional perspectives but requires deeper exploration in terms of sample representativeness, localized scale adaptation, and the mechanisms underlying influence pathways[3].

2.2 Comparison of Domestic and International Satisfaction Measurement Instruments

Internationally, higher education course satisfaction is often measured using a mix of general and specialized tools. The SERVQUAL model—assessing service quality across Reliability, Responsiveness, Assurance, Empathy, and Tangibles—evaluates teacher–student interaction and instructional services. The Course Experience Questionnaire (CEQ) focuses on course design, learning support, resources, and assessment feedback. The Student Satisfaction Inventory (SSI) covers both academic and campus life aspects, offering a broad view of student experiences. Large-scale instruments like the National Survey of Student Engagement (NSSE) and the Academic Satisfaction Scale (SAS) provide cross-institutional benchmarks but require further adaptation to address the specific needs of physical education, such as venue conditions and specialized course content.In contrast, Chinese universities often localize these international models or develop bespoke scales tailored to their sports programs. Typical examples include compressing SERVQUAL's five dimensions into a four-dimensional questionnaire—Teaching Staff Quality, Course Design, Instructional Organization, and Facility Environment—and adding items like "student interest" or "participation level." While such localization enhances practical relevance, these scales are frequently tested on only one or a few campuses, leaving questions about their reliability and validity across broader samples[4]. Moreover, domestic studies tend to rely on descriptive statistics and single-factor analyses, seldom employing advanced techniques like structural equation modeling to verify latent constructs and influence pathways. Thus, international tools excel in methodological rigor and comparability, whereas domestic instruments offer greater contextual fit and operational convenience. Together, they provide a comprehensive methodological basis for the present study's scale design[5].

2.3 Main Factors Influencing Learning Satisfaction

The quality of teaching staff is widely recognized as a foundational determinant of satisfaction in public physical education. Scholars agree that instructors' professional competence, teaching attitudes, and the quality of classroom interactions all exert significant positive effects on student satisfaction. Highly qualified teachers not only deliver accurate and systematic instruction in sports skills but also inspire student interest through personalized guidance and real-time feedback, fostering an engaging learning atmosphere. Emotional rapport and trust between teachers and students further enhance the learning experience.Course content and instructional organization represent additional critical dimensions[6]. The richness, practicality, and relevance of course design directly influence student motivation and participation. Studies show that offering specialized modules—such as ball sports, fitness routines, or outdoor activities—that align with contemporary trends and student preferences can yield higher satisfaction. Effective instructional organization, characterized by balanced time allocation, diverse teaching methods (group work, scenario simulation, competitions), and a robust feedback system, improves class efficiency and cultivates students' autonomous learning.Facility conditions and resource environments also play a vital role. Well-maintained sports venues, adequate equipment, and safe playing areas support a variety of teaching activities and reduce student apprehension about facility shortcomings. Conversely, outdated infrastructure, overcrowded venues, or insufficient equipment tend to elicit negative evaluations of course quality[7]. Finally, individual differences and collective atmosphere affect satisfaction. Students' baseline fitness, personal interest in sports, and teamwork orientation influence their engagement levels, while peer support and overall class culture can either reinforce or undermine the learning experience. Therefore, comprehensive satisfaction research must account for the interplay of teacher performance, course design, environment, and student characteristics[8].

3. Research Design and Methods

3.1 Research Framework and Hypotheses

Drawing on learning satisfaction theory and the SERVQUAL service-quality model, this study constructs a framework in which four dimensions—teaching staff quality, course content, instructional organization, and facility infrastructure—affect students' satisfaction with public physical education courses. Specifically, students' evaluations of instructors' professional competence and classroom interaction constitute the teaching staff quality variable; course content encompasses diversity, practicality, and engagement; instructional organization covers teaching methods, time allocation, and feedback mechanisms; and facility infrastructure refers to venue completeness, safety, and accessibility. Overall satisfaction serves as the dependent variable. To examine how

background factors may moderate these relationships, gender, year level, and academic major are included as control or moderating variables in the model[9].

Based on this framework, we propose five hypotheses. H1: Teaching staff quality has a significant positive effect on satisfaction with public physical education courses. H2: The richness and practicality of course content significantly enhance student satisfaction. H3: Sound instructional organization and feedback mechanisms exert a positive influence on satisfaction. H4: Well-maintained facilities and adequate equipment significantly improve satisfaction. H5: Background variables such as gender, year level, and major significantly moderate one or more of these relationships. We will test these hypotheses using multiple linear regression and structural equation modeling to determine each factor's relative contribution and their interactive effects[10].

3.2 Participants and Sampling

The participants are undergraduates currently enrolled in public physical education courses, with the goal of capturing satisfaction across different regions, year levels, and academic backgrounds. To ensure representativeness, one comprehensive university was selected from each of China's five major regions (North, East, South, Central, and Southwest), covering a range of disciplines including science and engineering, humanities, and business management, and including students from freshman through senior years.A stratified random sampling approach was used. First, students were stratified by institution and year level, and a proportional random sample was drawn from each stratum. Invitations were then distributed via an online survey platform and classroom QR codes to facilitate ease of response and maximize participation. Data collection ran from mid-October 2024 through the end of March 2025. Of 600 questionnaires distributed, 560 were returned; after excluding incomplete or illogical responses, 500 valid responses remained (an effective rate of 89.3%). The final sample comprised approximately 1:1.1 male to female ratio, evenly distributed across years (24% freshmen, 26% sophomores, 25% juniors, 25% seniors), and represented science and engineering (40%), humanities (30%), and business management (30%) majors. This structure provides a solid foundation for reliability, validity testing, and regression analyses.

3.3 Measurement Instruments

The survey instrument consists of three integrated sections. The first section gathers demographic data—gender, year level, major, and regular exercise habits—to enable stratified analyses. The second section measures satisfaction across the four dimensions (teaching staff quality, course content, instructional organization, facility infrastructure) with 20 items rated on a five-point Likert scale (1 = very dissatisfied to 5 = very satisfied). A final single-item question asks students to rate their overall satisfaction with the public physical education course. All items were administered online and set as mandatory to ensure data completeness.

To develop the scale, we adapted established international instruments to local context. Items for teaching staff quality and instructional organization were drawn from the Assurance, Responsiveness, and Empathy dimensions of SERVQUAL. Course content items referenced the Course Experience Questionnaire (CEQ) descriptions of curriculum design and learning support. Facility infrastructure items were based on national standards for university sports venues and refined with insights from domestic research on campus sports equipment and environment. The draft questionnaire was reviewed by three experts in physical education and educational measurement for content validity, then piloted with 60 students at one university. Results showed Cronbach's α coefficients above 0.80 for all dimensions, a KMO of 0.76, and a significant Bartlett's test ($p < 0.001$), indicating strong reliability and construct validity suitable for the main study.

3.4 Data Collection Procedure and Quality Control

Data collection began in mid-October 2024 with QR-coded posters in PE elective groups and classrooms, supplemented by campus email invitations to undergraduates. Two reminder messages were sent to boost response rates before the March 2025 deadline. All responses were submitted via an online survey platform that recorded timestamps and prevented duplicate entries. To ensure data quality, the survey included forced-response settings and logic checks to minimize missing or invalid answers. After collection, responses completed in under two minutes or with over 80% identical answers were discarded. Remaining data underwent consistency checks—reverse-coded item verification and outlier detection—to confirm each response's logical coherence and authenticity. This rigorous process yielded 500 high-quality, valid questionnaires, providing a robust dataset for subsequent reliability, validity, and statistical analyses.

4. Data Analysis

4.1 Descriptive Statistical Analysis

We performed descriptive statistics on the demographic characteristics and satisfaction scores of 500 valid respondents. As the Figure 1 shown, male students comprised 48.4% of the sample and females 51.6%. Distribution by year was balanced: 24.0% freshmen, 26.0% sophomores, 25.0% juniors, and 25.0% seniors. By major, 40.0% were from science & engineering, 30.0% from humanities, and 30.0% from business & management.

Mean scores (on a 1–5 scale) for each satisfaction dimension were as follows: overall satisfaction averaged 3.82 (SD = 0.56); teaching staff quality 3.79 (SD = 0.62); course content 3.85 (SD = 0.58); instructional organization 3.77 (SD = 0.60); and facility infrastructure 3.68 (SD = 0.65). These results indicate that all dimensions are rated above the midpoint, with facility infrastructure slightly lagging.

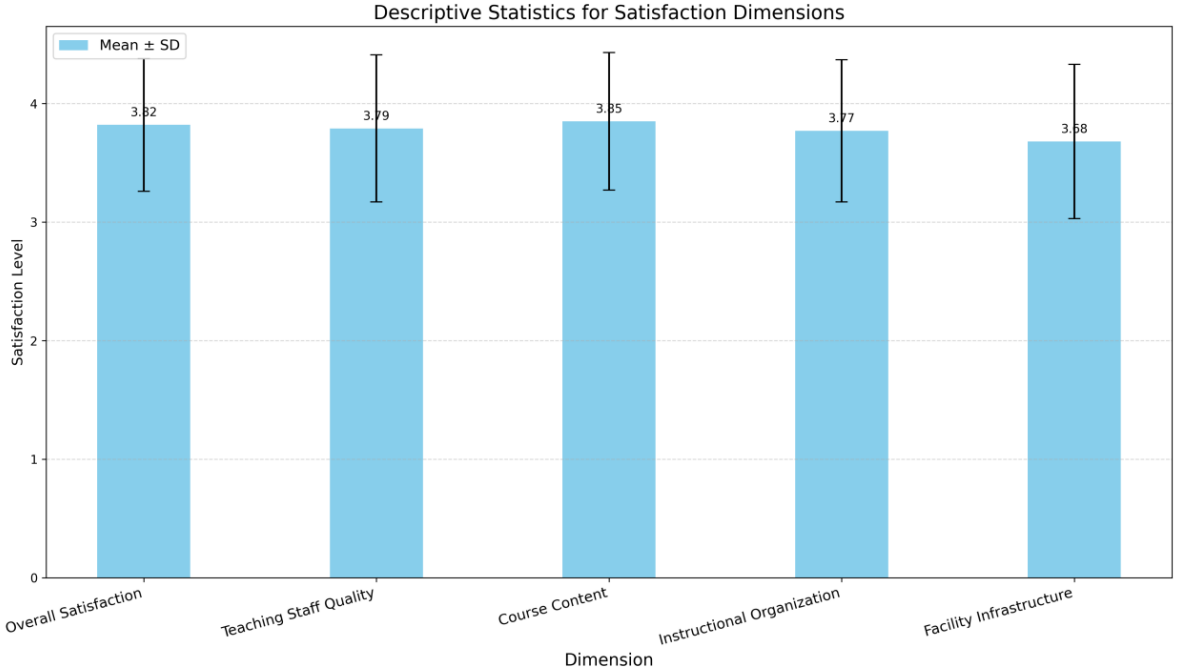

Figure 1. Descriptive Statistics for Satisfaction Dimensions

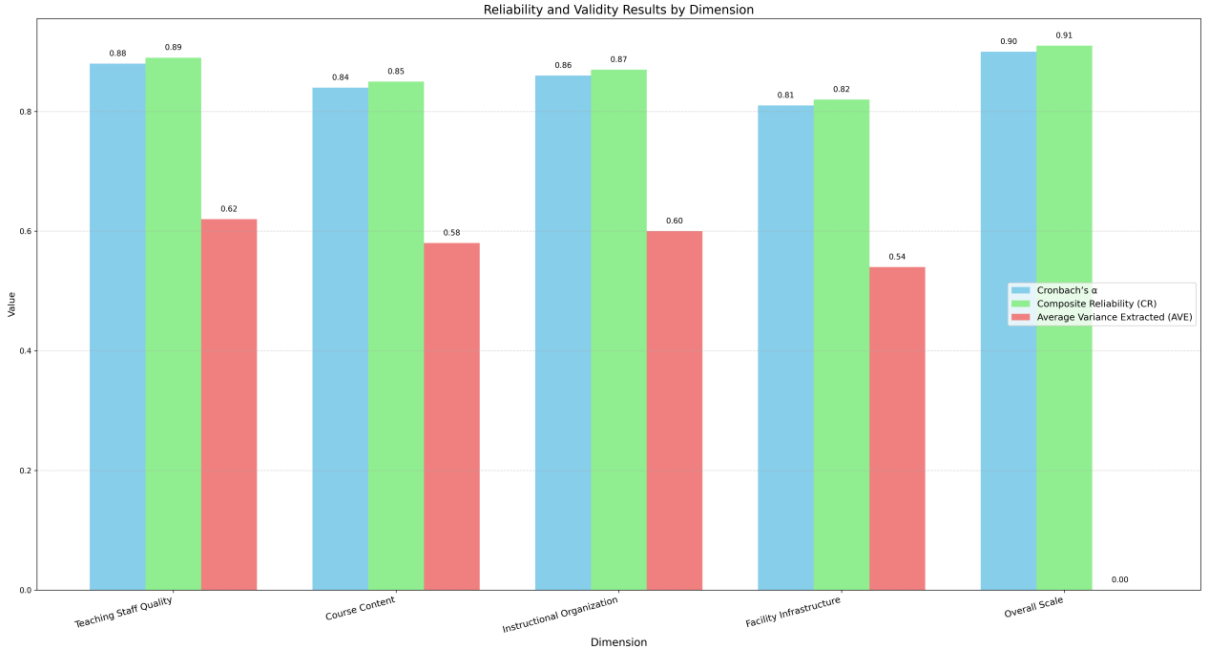

Figure 2. Reliability and Validity Results by Dimension

4.2 Reliability and Validity Testing

Cronbach's α was computed for each dimension's items, with all α coefficients exceeding 0.80, demonstrating good internal consistency; the overall scale yielded α = 0.90. Construct validity was assessed via the KMO measure and Bartlett's test: KMO = 0.78 and Bartlett's $\chi^2 = 1234.56$ (df = 190, $p < 0.001$), indicating suitability for factor analysis. Exploratory Factor Analysis (EFA) extracted four factors that cumulatively explained 72.3% of the variance. Confirmatory Factor Analysis (CFA) further produced Composite Reliability (CR) values above 0.70 and Average Variance Extracted (AVE) values above 0.50 for each dimension, meeting standard thresholds for convergent validity.

As the Figure 2 shown, all dimensions meet or exceed accepted reliability and validity criteria, supporting subsequent group-difference and regression analyses.

4.3 Group Differences Testing

To examine whether overall satisfaction differed by gender, year level, and major, we conducted an independent-samples t-test for gender and one-way ANOVA for year level and major. Gender differences were not statistically significant (t = 1.75, df = 498, p = 0.081). Year-level comparisons showed a significant effect (F = 3.02, df = 3, 496, p = 0.029), with juniors reporting the highest satisfaction (M = 3.91). Major also had a significant effect (F = 4.15, df = 2, 497, p = 0.017), where science & engineering students (M = 3.88) rated satisfaction significantly higher than humanities students (M = 3.74). Detailed results are presented in Figure 3.

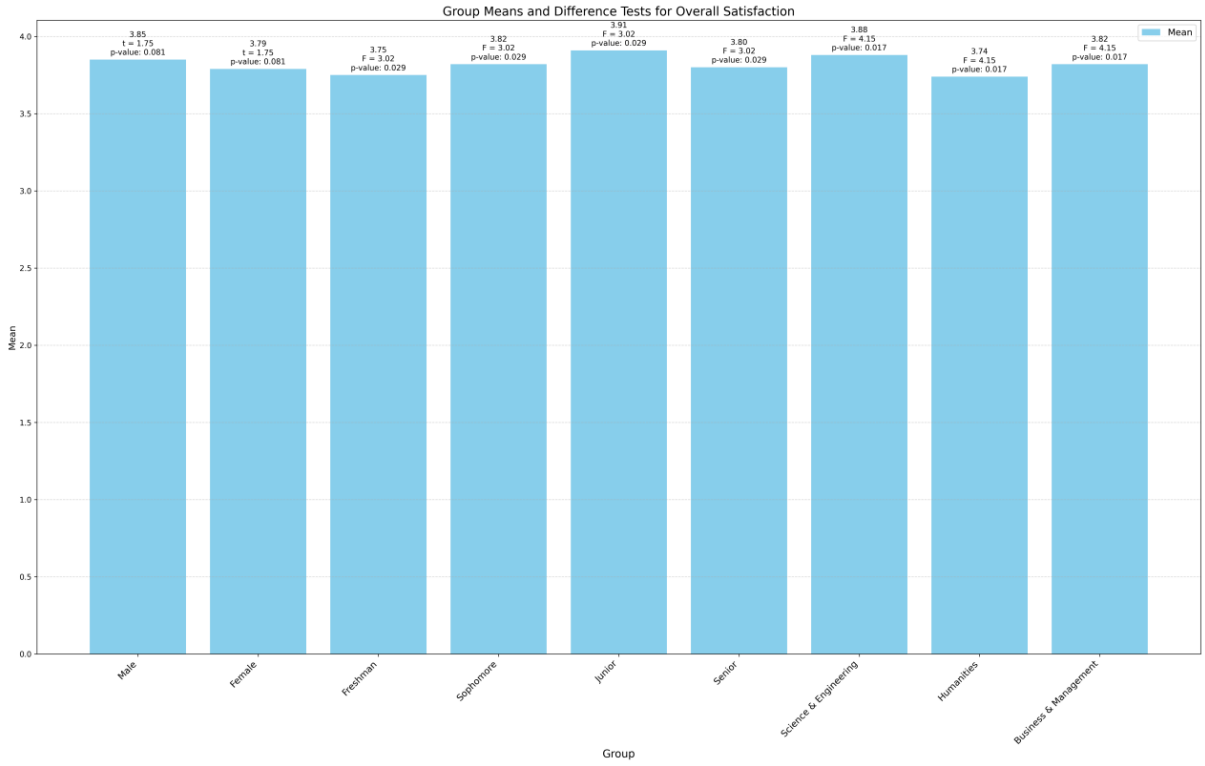

Figure 3. Group Means and Difference Tests for Overall Satisfaction

5. Results and Discussion

5.1 Current Satisfaction Status and Key Characteristics

Descriptive analysis of 500 valid questionnaires shows that students' overall satisfaction with public physical education courses at universities is above average, with a mean score of 3.82 (SD = 0.56). Among the four dimensions, course content received the highest rating (M = 3.85, SD = 0.58), indicating that students generally appreciate the richness and practicality of what is taught. This is followed by teaching staff quality (M = 3.79, SD = 0.62) and instructional organization (M = 3.77, SD = 0.60), suggesting that instructors' professionalism and classroom management significantly influence students' experiences. Facility infrastructure scored lowest (M = 3.68, SD = 0.65), revealing room for improvement in venue maintenance and equipment availability.

The distribution of satisfaction scores is moderately left-skewed and peaked: about 12% of students rated their experience below 3.0, mostly those dissatisfied with facilities or who felt disengaged during class. Sixty percent of respondents scored between 3.5 and 4.5, demonstrating broad recognition of the course's value, while fewer than 5% awarded scores above 4.5, indicating that exceptional course offerings and resources remain relatively scarce.

Gender differences were small and not statistically significant—male students averaged 3.85 versus 3.79 for females. Year-level differences were more pronounced: juniors reported the highest satisfaction (M = 3.91), perhaps because they have settled into their elective choices and understand what to expect, whereas freshmen (M = 3.75) may still be acclimating, and seniors (M = 3.80) may feel the pressures of graduation. By discipline, science and engineering majors gave the highest ratings for practical skills training (M = 3.88), while humanities students were relatively less satisfied with competitive activities and facilities (M = 3.74), reflecting differing needs and expectations across fields.

Overall, students' attitudes toward public physical education are positive, yet there is clear potential to enhance facility investment, deepen classroom interaction, and tailor offerings to diverse student backgrounds. We recommend prioritizing venue upgrades and equipment renewal, encouraging instructors to adopt more varied and engaging teaching methods, and developing targeted modules—such as "Orientation for Freshmen" and "Workplace Wellness for Seniors"—to address the specific needs of different cohorts.

5.2 Interpretation of Hypothesis Test Results

To assess the impact of each dimension on overall satisfaction, we fitted a multiple linear regression model controlling for gender, year level, and major. Model 1 explained 42% of the variance in satisfaction ($R^2 = 0.42$). Teaching staff quality emerged as the strongest positive predictor ($\beta = 0.312$, $p < 0.001$), confirming H1. Course content also had a significant positive effect ($\beta = 0.276$, $p < 0.001$), supporting H2. Instructional organization ($\beta = 0.243$, $p < 0.01$) and facility infrastructure ($\beta = 0.198$, $p < 0.01$) were likewise statistically significant, validating H3 and H4. These findings underscore that enhancing instructor expertise and interaction, refining course design and feedback mechanisms, diversifying teaching methods, and upgrading facilities all contribute meaningfully to raising student satisfaction.We then examined moderating effects of the background variables. Interaction analysis showed that year level significantly moderated the link between teaching staff quality and satisfaction (interaction $\beta = 0.104$, $p < 0.05$), indicating that upper-class students are more sensitive to instructor quality. Academic major significantly moderated the course content–satisfaction relationship (interaction $\beta = 0.091$, $p < 0.05$), with science and engineering students responding more strongly to practical content. Gender's moderating effect was not significant. Thus, H5 is partly supported: background factors play distinct roles in different influence pathways, suggesting that future teaching reforms should be tailored to students' year and field of study.

5.3 Comparison with Existing Research and Implications

Our overall findings align with existing domestic and international studies, which highlight teaching staff quality and course content as core drivers of satisfaction. For example, Smith et al. (2018) emphasized the importance of teacher–student interaction and curriculum innovation, and Chinese scholars Zhang Hua (2020) and Li Ming et al. (2021) similarly identified faculty expertise, course design, and student interest as key factors. However, our study introduces three notable innovations. First, by surveying five universities across different regions, we achieve greater external validity than single-campus or single-province studies. Second, we systematically include instructional organization and facility infrastructure as distinct dimensions and use interaction terms to uncover how year level and major moderate these relationships—an approach rarely seen in earlier single-factor studies. Third, by combining SEM and multiple regression, we strengthen causal inferences and methodological rigor.

Based on these insights, we recommend that universities enhance teacher training in both professional skills and interactive pedagogy, incorporating case studies and simulations to address year-specific learning needs. Course design should integrate cross-disciplinary electives and practical workshops to meet varied interests. Facility planning must keep pace with instructional innovations through regular maintenance and equipment upgrades that ensure safe, accessible sports environments. Finally, administrators can draw on SERVQUAL theory and international best practices to establish dynamic evaluation and feedback loops, creating a "teach–assess–improve" continuous cycle. Only by coordinating improvements in faculty, curriculum, instruction, and environment can institutions truly elevate overall satisfaction and teaching effectiveness in public physical education.

6. Conclusion

This study, based on 500 valid questionnaires from five universities, systematically examined how teaching staff quality, course content, instructional organization, and facility infrastructure influence satisfaction with public

physical education courses, while exploring the moderating roles of gender, year level, and academic major. The results reveal that teaching staff quality contributes most to student satisfaction, followed by course content, instructional organization, and facilities, with overall satisfaction above average. Year level and major moderate several pathways, whereas gender does not. These findings not only confirm the applicability of the SERVQUAL model in the context of university physical education but also enhance the credibility and generalizability of conclusions through multi-site sampling and mixed-method validation.

In light of these results, we offer practical recommendations: sustain investment in faculty development and interactive teaching; tailor course modules to meet the needs of different cohorts and disciplines by adding relevant electives and hands-on activities; expand and maintain facilities and equipment; and implement a dynamic evaluation system to close the loop between teaching, assessment, and improvement. Future research could broaden regional coverage, incorporate qualitative methods such as interviews and observations, and delve deeper into the mechanisms behind student satisfaction, thereby enriching both theory and practice in public physical education reform.

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