DEVELOPING A MEASUREMENT SCALE FOR STUDENT SATISFACTION WITH SERVICE QUALITY AT DANANG SPORT UNIVERSITY

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Abstract:

This study aims to develop and validate a measurement scale assessing student satisfaction with service quality at Danang Sport University. A mixed-methods approach was employed, combining qualitative and quantitative techniques, including expert interviews, student surveys, and statistical analyses using Cronbach's Alpha, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM). The final scale comprises six dimensions with 29 observed variables: Academic–Administrative Services, Dormitory, Library, Facilities, Healthcare, and Youth Union or Student Association's Activities. All scales demonstrated reliability and convergent validity, and the measurement model exhibited a high degree of fit. SEM analysis revealed that five factors—Academic–Administrative Services, Facilities, Library, Dormitory, and Healthcare— exerted a positive and statistically significant influence on students' overall satisfaction, with Academic and Administrative Services being the most influential determinant. Conversely, the Youth Union and Student Association's Activities showed no statistically significant effect. The findings provide empirical evidence to guide institutional improvements in support services, enhance service quality, and strengthen the university's educational reputation.

Keywords: student satisfaction, service quality, academic–administrative services, dormitory, library, facilities, healthcare, Youth Union's activities, students' association, higher education

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1. Introduction

In the context of learner-centered higher education, student satisfaction is regarded as a critical indicator reflecting both the quality of training and institutional reputation. Beyond teaching activities, support services, infrastructure, and the learning environment directly impact the students' experience.

Danang Sport University has made considerable efforts to improve learning and living conditions; however, a systematic investigation into students' satisfaction has not been conducted yet. Moreover, the distinctive characteristics of education in the field of physical education and sports have put this assessment into consideration. Accordingly, the study entitled *"Developing a Measurement Scale for Assessing Student Satisfaction with Service Quality at Danang Sport University"* holds practical and strategic significance for the university's development.

2. Theoretical Framework

2.1 Service Quality in Higher Education

In the context of higher education, service quality refers to the gap between what students expect and what they perceive to be delivered by the institution through academic settings, personal development/training, and campus life services. This perspective differs from the notion of educational quality, which primarily emphasizes curriculum and instruction.

Parasuraman *et al.* (1988) introduced the SERVQUAL model with five dimensions: reliability, responsiveness, empathy, tangibles, and assurance. However, Cronin and Taylor (1992) argued that linking service quality to expectations may lead to confusion, and thus proposed the SERVPERF model, which retains the core dimensions but focuses solely on customers' actual perceptions.

Tran Thi Kim Chi (2019) identified five factors influencing student satisfaction at Lac Hong University, with facilities having the strongest impact.

Overall, prior studies have consistently emphasized that service quality in higher education extends beyond teaching to include facilities, support services, and students' overall experiences, thereby necessitating scientific measurement tools for systematic evaluation and continuous improvement.

2.2 Student Satisfaction with Service Quality in Higher Education

Dinh, HT, Nguyen, QAT, Phan, MT, Pham, KT, Nguyen, T., & Nguyen, HT (2021) examined Vietnamese students' satisfaction with higher education services. The authors proposed a five-dimensional model of satisfaction with educational services, comprising service accessibility, facilities, environment, educational activities, and learning outcomes. Among these, educational activities were found to have the strongest effect on satisfaction with academic outcomes.

The study underscored that student satisfaction with service quality—both in academic provision and in student support services—constitutes a core element in enhancing overall satisfaction, strengthening institutional reputation, and ensuring sustainable development in higher education.

3. Research Subjects and Methodology

3.1 Research Subjects
3.1.1 Research Subjects
Student satisfaction with service quality at the university.

3.1.2 Survey Participants
A cohort of 16th, 17th, and 18th undergraduate students is currently enrolled at Danang Sport University.

3.2 Research Methodology
3.2.1 Qualitative Research:
- Conducting experts and students' interviews to identify factors influencing satisfaction.
- Reviewing existing measurement models (e.g., SERVQUAL, HEdPERF, HEdQUAL) to develop a set of criteria tailored to the university's specific context.

3.2.2 Quantitative Research:
- Carrying out a survey with a questionnaire based on qualitative findings, employing a five-point Likert scale.
- Selecting a sample by cohort and faculty at random to ensure representativeness.
The 1st survey: 780 questionnaires were distributed, of which 754 were returned. After eliminating 107 invalid responses, 647 valid questionnaires (82.95%) were retained for analysis.

The 2nd survey: 950 questionnaires were distributed, with 928 returned. After excluding 56 invalid responses, 872 valid questionnaires (91.79%) were included in the analysis.

3.3 Data Analysis Techniques:
- Cronbach's Alpha: Assessing internal consistency of observed variables.
- Exploratory Factor Analysis (EFA): Identifying underlying factors.
- Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM): Validating the measurement model.

4. Research Findings

4.1 Content and Formation Validity Assessment

- **Phase 1**: An initial measurement scale for assessing student satisfaction with service quality was developed, consisting of six dimensions and a total of 45 items: 11 items for Academic and Administrative Services, 6 items for Dormitory, 5 items for Library, 11 items for Facilities, 4 items for Health Care, and 8 items for Youth Union or Students' Associations' Activities. In addition, the scale for Overall Satisfaction included 6 items.
- **Phase 2**: Formation validity was evaluated through interviews with 12 experts, leading to the elimination of 7 items, resulting in 40 items retained.
- **Phase 3**: A pilot test was conducted with 96 students who served as the cabinet from 32 classes. Based on the results, 2 items were removed, leaving 38 items in total.

Through these three stages, the final measurement scale was established, consisting of six dimensions with 38 observed variables.

4.2 Statistical Assessment

4.2.1 Exploratory Factor Analysis (EFA)

4.2.1.1 Measurement scale for students' satisfaction with service quality components:

EFA was conducted on a sample of 647 valid responses to identify core factors. The KMO value was 0.829 (>0.5), and Bartlett's Test was statistically significant (Sig. = 0.000 < 0.05), indicating suitability for factor analysis. Principal Component Analysis with Varimax rotation extracted six factors, collectively accounting for 58.393% of the total variance. Variables with factor loadings greater than 0.4 were retained. Accordingly, the measurement scale of six dimensions was refined from 38 to 29 observed items, as presented in Table 1.

Table 1: Results of EFA for Component Variables (n = 647)

Dimension	Variable Code	Item Description	Factor Loading
Academic–Administrative Services CA=0.851	HCHT1	Administrative procedures (course registration, documents, etc.) are handled promptly and conveniently.	0.716
	HCHT3	Lecturers/advisors are available to support and respond to student inquiries in a timely manner.	0.732
	HCHT4	Information on schedules, exams, and academic regulations is clearly and promptly provided.	0.712
	HCHT6	Teaching methods are engaging, easy to understand, and encourage student participation.	0.735
	HCHT7	The integration of theory and practice in the curriculum is appropriate and effective.	0.729
	HCHT8	The curriculum supports the development of professional skills in sports and physical education.	0.699
	HCHT9	Exams and assessments are conducted fairly, seriously, and in accordance with regulations.	0.740

Dormitory CA=0.788	KTX1	Dormitory facilities (beds, furniture, utilities, sanitation) meet students' living needs.	0.753
	KTX2	The dormitory environment is clean, safe, and conducive to study and living.	0.794
	KTX3	Security and support services (repairs, internet, healthcare) are ensured and promptly addressed.	0.794
	KTX5	Dormitory regulations and guidelines are clear and comprehensive.	0.749
Library CA=0.790	TV1	Library materials, textbooks, and references meet students' academic and research needs.	0.766
	TV2	The search and borrowing system (including digital/online library) is convenient and user-friendly.	0.779
	TV3	Study space, seating, lighting, and environment in the library support effective learning.	0.774
	TV5	Library staff are professional and courteous in communication	0.791
Facilities CA=0.842	CSVC1	Classrooms are well-equipped (furniture, lighting, sound, sanitation) for learning.	0.729
	CSVC2	Facilities for practice and sports training (fields, gyms, equipment) meet training requirements.	0.739
	CSVC3	Teaching facilities (projectors, boards, support tools) are modern, user-friendly and function reliably.	0.744
	CSVC7	The campus and landscape are clean, well-ventilated, and regularly maintained.	0.718
	CSVC8	Auxiliary facilities (restrooms, parking, common areas) are adequately equipped and ensure safety.	0.773
	CSVC9	The campus security system ensures a safe environment for students' learning and training	0.726
Healthcare CA=0.719	YT1	The health center is adequately equipped with basic medical supplies and facilities.	0.779
	YT2	Medical staffs are friendly, enthusiastic, and professionally competent.	0.792
	YT3	Health services (check-ups, sports injury care, health counseling) are timely and effective.	0.770
Youth Union and Student Association's Activities CA=0.820	PTDH1	Extracurricular activities are diverse, engaging, and attract student participation.	0.761
	PTDH2	Extracurricular activities help students develop soft skills (communication, teamwork, leadership	0.738
	PTDH3	The timing and format of activities are appropriate and facilitate student participation.	0.777
	PTDH5	Communication and information about activities are clear and timely.	0.746
	PTDH6	Coordination between the university and the student union in organizing activities is effective.	0.760

4.2.1.2 General Satisfaction Scale

The factor analysis yielded a KMO value of 0.890, and Bartlett's Test of Sphericity was statistically significant (Sig. = 0.000). Observed variables with factor loadings greater than 0.5 and loading on a single factor were retained. The results are presented in Table 2.

Table 2: EFA Results for General Satisfaction Scale (n = 647)

Dimension	Variable Code	Item Description	Factor Loading
General Satisfaction CA=0.852	HL1	Satisfaction with the quality of education and support services provided by the university.	0.748
	HL2	The degree to which initial expectations regarding study and campus life were met.	0.751
	HL3	Perceived value of the university experience in relation to time, effort, and cost invested.	0.708
	HL4	Overall satisfaction with the learning, training, and development environment.	0.728
	HL5	Willingness to recommend the university to friends or relatives interested in this field.	0.784
	HL6	Willingness to choose the university again if given the opportunity.	0.791

4.2.2 Confirmatory Factor Analysis (CFA)

4.2.2.1 Model Fit Assessment

CFA was conducted on the six-factor model comprising 29 observed variables (Figure 1). The model met the fit criteria: $\chi^2/df = 1.486$, CFI = 0.989, TLI = 0.987, RMSEA = 0.024 (90% CI: 0.019–0.028), indicating a good fit to the data.
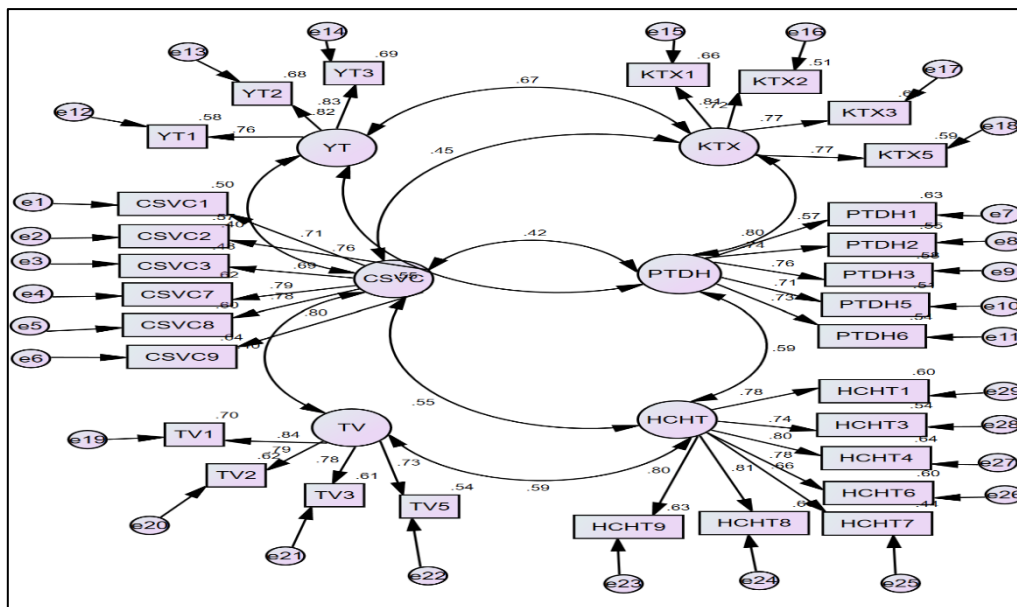
Figure 1: Standardized CFA results (n = 647)

4.2.2.2 Reliability and Convergent Validity

Dimension	Cronbach's Alpha	Composite Reliability CR[1]	Average Variance Extracted AVE[2]
Academic–Administrative Services (HCHT)	0.918	0.841	0.432
Dormitory (KTX)	0.851	0.778	0.468
Library (TV)	0.874	0.809	0.514
Facilities (CSVC)	0.904	0.819	0.476
Healthcare (YT)	0.846	0.847	0.649
Youth Union and Student Association's Activities (PTDH)	0.878	0.781	0.417

All scales demonstrated high internal consistency (Cronbach's Alpha > 0.7) and composite reliability (CR > 0.7). Although only Library and Healthcare met the AVE ≥ 0.50 threshold, according to Fornell & Larcker's criterion, convergent validity is acceptable when CR > 0.7 even if AVE < 0.5.

4.2.2.3 Discriminant Validity

Factor Pair	Correlation Estimate	p-value
HCHT↔TV	0.595	0.001
HCHT↔CSVC	0.552	0.001
HCHT↔PTDH	0.585	0.001
KTX↔CSVC	0.454	0.001
KTX↔YT	0.672	0.001
KTX↔PTDH	0.571	0.001
TV↔CSVC	0.396	0.001
CSVC↔YT	0.402	0.001
YT↔PTDH	0.550	0.001
PTDH↔CSVC	0.424	0.001

Discriminant validity was assessed using the Fornell–Larcker criterion, which indicated that the square root of the AVE for each factor exceeded its correlations with other factors, thereby confirming discriminant validity. All inter-factor correlations were statistically significant (p = 0.001).

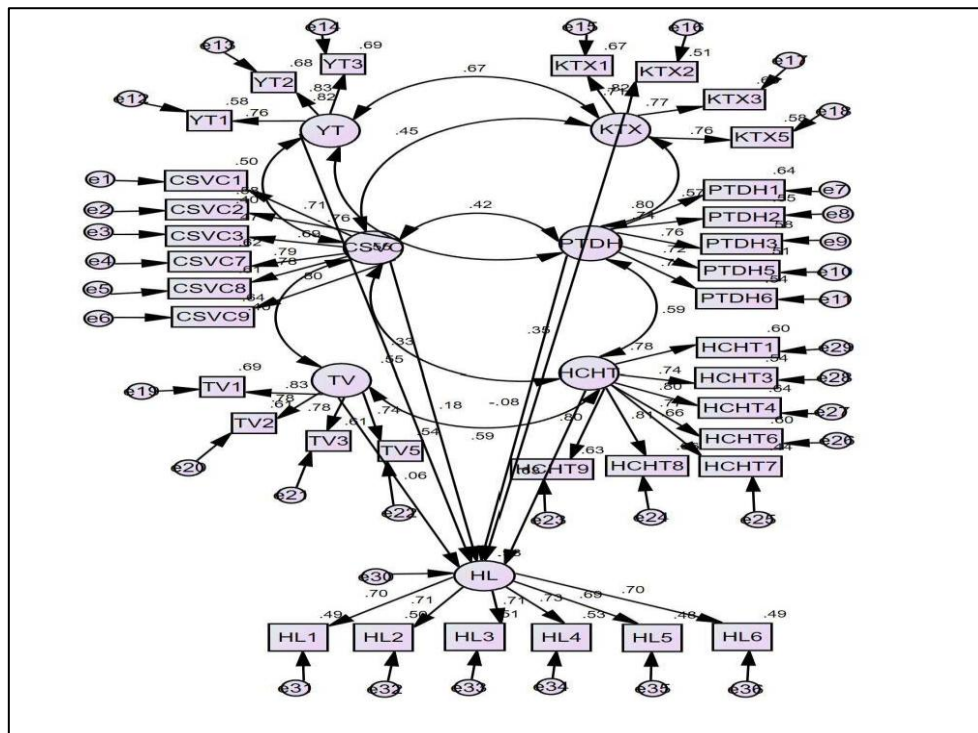## 4.2.2.4 Structural Equation Modeling (SEM): Impact of Service Quality Dimensions on Overall Satisfaction

Figure 2: Standardized SEM Results (n = 872)

Model fit indices: χ^2/df = 1.393, CFI = 0.989, TLI = 0.988, RMSEA = 0.021 (90% CI: 0.018–0.025), indicating excellent model fit.

Path	Unstandardized Estimate	S.E.	p-value	Standardized Estimate (β)
HL ← CSVC	0.518	0.258	0.027	0.579
HL ← PTDH	-0.069	0.243	0.778	-0.076
HL ← YT	0.290	0.091	0.001	0.333
HL ← KTX	0.301	0.117	0.010	0.352
HL ← TV	0.505	0.234	0.028	0.508
HL ← HCHT	0.545	0.260	0.036	0.628

The SEM results indicate that Academic–Administrative Services (HCHT), Facilities (CSVC), Library (TV), Dormitory (KTX), and Healthcare (YT) all exert positive and statistically significant effects on overall student satisfaction. Among these, Academic–Administrative Services had the strongest impact (β = 0.628), followed by Facilities (β = 0.579) and Library (β = 0.508). The Youth Union and Student Association's Activities (PTDH) showed a negative coefficient and was not statistically significant (p = 0.778), suggesting no meaningful influence on overall satisfaction.

5. Discussion

The findings of this study confirm that the measurement scale for student satisfaction with service quality at Danang University of Sports and Physical Education comprises six dimensions: Academic–Administrative Services, Dormitory, Library, Facilities, Healthcare, and Youth Union and Student Association's Activities (PTDH). The CFA and SEM validation models demonstrated high goodness-of-fit, affirming the reliability and validity of the proposed scale.

First, Academic–Administrative Services emerged as the most influential factor (β = 0.628). This result aligns with previous studies conducted in Vietnam (Dinh *et al.*, 2021; Tran Thi Kim Chi, 2019), which emphasized that convenience, transparency in procedures, fairness in assessment, and teaching quality are critical elements in building student trust. These findings suggest that the university should continue improving administrative processes, enhancing teaching quality, and strengthening academic support to improve overall satisfaction.

Second, Facilities had a significant impact (β = 0.579), consistent with the findings of Tran Thi Kim Chi (2019), where facilities were identified as the most influential factor at Lac Hong University. The quality of sports fields, training halls, classrooms, and instructional equipment plays a vital role owing to the specific characteristics of sports and physical education training. Therefore, maintaining and upgrading facilities not only enhances educational quality but also significantly improves students' learning and training experiences.

Third, the Library also showed a positive effect (β = 0.508). In the context of digital transformation in higher education, libraries must evolve beyond traditional resources to include digital learning materials, online search systems, and modern study spaces. The library's clear contribution to student satisfaction reflects the growing demand for information resources and research support.

Fourth, Dormitory and Healthcare services had statistically significant positive effects, though at lower levels (β = 0.352 and β = 0.333, respectively). These findings underscore the importance of student welfare services in ensuring service quality. For students in sports-related disciplines, timely and effective medical services—such as injury care and health counseling—are essential to sustaining their academic and physical development.

Conversely, Youth Union and Student Association's Activities did not show a significant impact on overall satisfaction (p = 0.778). This contrasts with some prior studies (e.g., Dinh *et al.*, 2021), which identified extracurricular activities as influential. The discrepancy may stem from students' priorities between academic and daily life factors over supplementary activities. Nonetheless, the role of student unions in developing soft skills and fostering community spirit remains important. Therefore, the university should focus on enhancing its quality, relevance, and alignment with the sports and physical education rather than increasing the quantity of activities to better engage students.

Overall, the study reinforces that student satisfaction with service quality in higher education depends not only on instructional quality but also on a comprehensive support ecosystem. The proposed measurement model is feasible and applicable to other institutions in the same field. Furthermore, the research provides empirical evidence to guide institutional policy in five key areas: (i) improving administrative procedures and teaching quality; (ii) investing in the maintenance and upgrading of facilities; (iii) modernizing the library through digital transformation; (iv) enhancing healthcare and dormitory services; (v) innovating students' activities to foster stronger engagement with the university.

6. Conclusion and Recommendations

This study successfully developed and validated a measurement scale for student satisfaction with service quality at Danang Sport University, comprising six dimensions: Academic–Administrative Services, Facilities, Library, Dormitory, Healthcare, and Youth Union and Student Association's Activities. The results indicate that the first five dimensions have statistically significant positive effects on overall satisfaction, with Academic–Administrative Services being the most influential. The Youth Union and Student Association's Activities dimension did not show a clear impact.

These findings affirm that student satisfaction is primarily driven by teaching quality, transparent administrative processes, and the availability of supportive infrastructure and services. To enhance service quality and institutional reputation, the university should prioritize the following strategic directions:

- Streamline administrative procedures and improve teaching quality, particularly in student support and academic advising.
- Invest in upgrading facilities and instructional equipment to meet the specific needs of sports and physical education training.
- Modernize the library by expanding digital resources and creating open, tech-enabled learning spaces.
- Strengthen healthcare services and improve dormitory conditions to meet students' living and wellness needs.
- Revamp students' extra activities to align with academic disciplines and foster meaningful student engagement.

This study not only provides a practical foundation for service quality improvement at the university but also offers a reference framework for other institutions in the field of sports and physical education across Vietnam to adopt and further develop.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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References

[1] Cronin, J., & Taylor, A. (1992). Measuring service quality: A reexamination and extension. *Journal of Marketing*, *56*(3), 55–68. https://doi.org/10.2307/1252296

[2] Nguyen, N. V. P., *et al.* (2024). Development and validation of a measurement scale for medical students' satisfaction with online learning at Pham Ngoc Thach University of Medicine. *Ho Chi Minh City Open University Journal of Social Sciences*, *19*(2), 15–27.

[3] Nguyen, T. B., *et al.* (2017). Developing and standardizing a tool for assessing student satisfaction with training activities at Hai Duong Central College of Pharmacy. *Vietnam Journal of Community Medicine*, *41*, 134–140.

[4] Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, *64*(1), 12–40. Retrieved from https://www.researchgate.net/publication/200827786_SERVQUAL_A_Multiple-item_Scale_for_Measuring_Consumer_Perceptions_of_Service_Quality

[5] Pham, T. L. P., & Pham, T. H. (2019). Student satisfaction with the service quality of universities in Ho Chi Minh City. *Journal of Science, Ho Chi Minh City University of Education*, (4), 101–113.

[6] Tran, T. K. C. (2019). Factors influencing student satisfaction with the quality of support services at Lac Hong University. *Journal of Science, Ho Chi Minh City University of Education*, (11), 775–786.