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Student participation and factors associated with satisfaction with volleyball at Saigon University

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Abstract
Objective: This study described students' participation in volleyball and examined associations between selected teaching and learning characteristics and student satisfaction at Saigon University.
Methods: A cross-sectional survey using a structured questionnaire was conducted with 1,000 students who had completed or were currently taking the Volleyball course. Analyses included descriptive statistics, Cronbach's alpha, exploratory factor analysis, Pearson correlations, multiple linear regression, and group comparisons.
Results: In the reported sample, 71.5% of students attended every class session, while 32.1% did not practice outside class. All five factors were positively correlated with satisfaction. The regression model had an adjusted R^2 of 0.618. Facilities and equipment had the largest standardized coefficient ($\beta = 0.324$), followed by instructor competence and attitude ($\beta = 0.278$), course content and teaching methods ($\beta = 0.215$), assessment ($\beta = 0.146$), and the classroom interaction environment ($\beta = 0.112$).
Conclusion: Within the surveyed sample, facilities and equipment showed the strongest association with satisfaction, followed by instructor competence and attitude. The findings identify aspects that may be considered when reviewing volleyball instruction.

Keywords: Physical education, volleyball, student satisfaction, learning participation, Saigon University

Introduction

In higher education, physical education provides students with opportunities to develop motor skills and maintain an active lifestyle. Reviews of physical education and school sport indicate potential benefits, although outcomes depend on content, organization, and implementation context (Bailey, 2006).[2] In Vietnam, Decision No. 107/QĐ-TTg, dated January 14, 2011, approved the national project for developing the physical stature and fitness of Vietnamese people for 2011–2030 and emphasized the role of sport and physical education. Volleyball is a team sport that requires coordination and practice of fundamental skills such as forearm passing, setting, serving, and spiking. Courts, nets, and balls may affect students' learning experiences and opportunities to practice during class. Research on volleyball athletes also indicates that skills and physical fitness can change through training programs; however, findings from athlete samples cannot be directly generalized to students taking a general education course (Gabbett *255–279*., 2006).[7] Student satisfaction is commonly used as an indicator of learning experience and service quality in higher education (Elliott & Shin, 2002).[6] SERVQUAL and HEdPERF provide frameworks for examining service quality; when applied to sport courses, their dimensions need to be adapted to the characteristics of instruction and practice conditions (Cronin & Taylor, 1992; Abdullah, 2006).[1, 4] At Saigon University, this study addressed three questions: (1) how students participate in and practice volleyball outside class; (2) how instructor-related factors, course content and teaching methods, facilities, assessment, and classroom interaction are associated with satisfaction; and (3) how strongly these factors are relatively associated with satisfaction in a regression model. The study aims to provide information for reviewing volleyball instruction at the university.

Methods

1. Study design and analytical framework

This cross-sectional study used a structured questionnaire and quantitative analyses. The analytical framework drew on SERVQUAL (Parasuraman *et al*., 1988),[9] HEdPERF (Abdullah, 2006),[1] and self-determination theory as applied to learning and physical activity motivation (Deci & Ryan, 2000; Vallerand, 2007).[5, 11] Five hypotheses proposed positive associations between teaching and learning factors and student satisfaction. The proposed research model included five hypotheses:
H1: Instructor competence and teaching style (GV) are positively associated with student satisfaction (HL).
H2: Course content and teaching methods (PP) are positively associated with student satisfaction (HL).
H3: Facilities and sports equipment (CSVC) are positively associated with student satisfaction (HL).
H4: Course assessment methods (KT) are positively associated with student satisfaction (HL).
H5: The classroom interaction environment (TT) is positively associated with student satisfaction (HL).

2. Participants and data collection

Participants were full-time undergraduate students at Saigon University who had completed or were currently taking Volleyball 1 or Volleyball 2. The study recorded 1,000 valid questionnaires collected from March to May 2026. Participants were from cohorts K21–K24 and multiple academic fields. The sample was selected using quota-guided convenience sampling rather than probability sampling; therefore, findings should be generalized with caution.

3. Measurement instrument

The questionnaire had three parts:

Part A: Student demographic and general information.
Part B: Participation in and motivation for learning volleyball.

Part C: Twenty-four observed items measuring five independent factors and one dependent factor on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree): instructor competence (GV, 4 items), course content and teaching methods (PP, 4 items), facilities (CSVC, 5 items), assessment (KT, 4 items), classroom interaction (TT, 3 items), and overall satisfaction (HL, 4 items).

4. Data processing and analysis

Data were analyzed using SPSS version 26.0. The analyses included: Descriptive statistics: mean, standard deviation (SD), frequency (n), and percentage (%). Scale reliability: Cronbach's alpha; the stated acceptance criteria were $\alpha \geq 0.70$ and item–total correlation ≥ 0.30. Exploratory factor analysis (EFA): assessment of the Kaiser–Meyer–Olkin statistic (KMO ≥ 0.50), Bartlett's test ($p < 0.05$), total variance explained ($\geq 50\%$), and factor loadings (≥ 0.50) (Hair *et al*., 2019).[8] Pearson correlation: assessment of linear associations between the factors and satisfaction. Multiple linear regression: estimation of associations between the five factors and satisfaction. The manuscript reports VIF and Durbin–Watson statistics to assess multicollinearity and autocorrelation. Group comparisons: independent-samples t test and one-way analysis of variance (ANOVA) to compare satisfaction scores by gender and cohort.

Results

1. Sample characteristics and participation in learning

The sample comprised 532 women (53.2%) and 468 men (46.8%). Cohort distribution was K21, 18.5%; K22, 34.2%; K23, 35.6%; and K24, 11.7%. Enrollment reasons, attendance, independent practice, and self-rated skill acquisition are summarized in Table 1.

Table 1: Participation in and motivation for learning volleyball (N = 1,000)

Evaluation criterion	Category / detail	Frequency (n)	Percent (%)	Mean	SD
Main reason for enrolling	Enjoyment of volleyball	436	43.6%	-	-
	Health and fitness	312	31.2%	-	-
	Enrolled with friends / timetable conflict	184	18.4%	-	-
	Other sports courses were full	68	6.8%	-	-
Class attendance	Attended all sessions (100%)	715	71.5%	4.62	0.61
	Missed one class session	218	21.8%		
	Missed two or more sessions	67	6.7%		
Frequency of practice outside class	No additional practice	321	32.1%	2.84	1.12
	Practiced 1–2 times per week	486	48.6%		
	Practiced 3 or more times per week	193	19.3%		
Self-rated skill acquisition	Mastered and performed skills well	382	38.2%	3.45	0.78
	Reached an intermediate level and performed movements correctly	512	51.2%		
	Had difficulty performing skills	106	10.6%		

Note: Means and standard deviations were calculated on a 1–5 scale.

2. Scale reliability

Cronbach's alpha and the minimum item–total correlations for the scales are presented in Table 2.

Table 2: Reliability of the scales (N = 1,000)

Code	Scale / construct	Number of items	Cronbach's alpha	Minimum item–total correlation
GV	Instructor competence and attitude	4	0.894	0.712 (GV4)
PP	Course content and teaching methods	4	0.865	0.654 (PP1)
CSVC	Facilities and equipment	5	0.915	0.724 (CSVC5)
KT	Assessment methods	4	0.878	0.681 (KT4)
TT	Classroom interaction environment	3	0.841	0.642 (TT3)
HL	Overall student satisfaction	4	0.902	0.735 (HL4)

Cronbach's alpha values for the six scales ranged from 0.841 to 0.915. The minimum item–total correlation for each scale exceeded 0.60.

3. Exploratory factor analysis

EFA was conducted separately for the independent variables and the dependent variable. For the 20 independent-variable items, KMO = 0.912 and Bartlett's test was $\chi^2(190) = 12{,}846.52$, $p < 0.001$. Varimax rotation yielded five factors, explaining 66.24% of the total variance; factor loadings ranged from 0.634 to 0.847. For the satisfaction scale, EFA yielded one factor (eigenvalue = 3.114; variance explained = 77.85%; KMO = 0.835; Bartlett's test $p < 0.001$).

4. Pearson correlations

Pearson correlations were used to examine linear associations between the five independent factors and satisfaction.

Table 3: Pearson correlation matrix for the model variables (N = 1,000)

Variable	Mean	SD	GV	PP	CSVC	KT	TT	HL
GV	4.02	0.68	1					
PP	3.78	0.71	0.512 p ≈ 6.45E-68	1				
CSVC	3.35	0.85	0.418 p ≈ 1.45E-43	0.435 p ≈ 2.01E-47	1			
KT	3.92	0.65	0.485 p ≈ 3.97E-60	0.502 p ≈ 5.97E-65	0.398 p ≈ 2.67E-39	1		
TT	3.86	0.72	0.392 p ≈ 4.47E-38	0.415 p ≈ 6.61E-43	0.356 p ≈ 3.02E-31	0.421 p ≈ 3.14E-44	1	
HL	3.69	0.76	0.578 p ≈ 3.36E-90	0.542 p ≈ 1.96E-77	0.614 p ≈ 1.16E-104	0.496 p ≈ 3.23E-63	0.448 p ≈ 1.59E-50	1

Note: Each lower-triangle cell presents the correlation coefficient r and an estimated p value (two-tailed test). P values were calculated from r values rounded to three decimal places and N = 1,000; they should be checked against the original data or SPSS output before publication.

The coefficients in Table 3 indicate that all five factors were positively correlated with satisfaction ($p < 0.01$). The strongest correlation was between facilities and satisfaction ($r = 0.614$), followed by instructor competence and satisfaction ($r = 0.578$).

5. Multiple linear regression

Results from the simultaneous-entry (Enter) multiple linear regression are presented in Table 4.

Table 4: Multiple linear regression results (N = 1,000)

Model / factor	B	SE	β	t	p	VIF
(Constant)	0.185	0.086	-	2.151	0.032	-
GV	0.316	0.028	0.278	11.286	< 0.001	1.550
PP	0.234	0.027	0.215	8.667	< 0.001	1.567
CSVC	0.292	0.021	0.324	13.904	< 0.001	1.387
KT	0.174	0.029	0.146	6.000	< 0.001	1.511
TT	0.117	0.024	0.112	4.875	< 0.001	1.344

Note. Dependent variable: HL. B = unstandardized coefficient; SE = standard error; β = standardized coefficient; VIF = variance inflation factor. $R = 0.787$; $R^2 = 0.620$; adjusted $R^2 = 0.618$; $F = 324.56$, $p < 0.001$; Durbin–Watson = 1.942.

The five predictors accounted for 61.8% of the variance in satisfaction scores in the sample (adjusted $R^2 = 0.618$). The F test indicated that the model was statistically significant ($F = 324.56$, $p < 0.001$). Durbin–Watson was 1.942, and all VIF values were below 2.0. These results do not rule out bias related to the cross-sectional design, sampling method, or measurement error. The standardized regression equation based on the reported coefficients was: HL = 0.324 × CSVC + 0.278 × GV + 0.215 × PP + 0.146 × KT + 0.112 × TT.

6. Comparisons by sample characteristics

The independent-samples t test found no statistically significant difference in satisfaction scores between men (Mean = 3.71) and women (Mean = 3.67), $t = 1.280$, $p = 0.201$. ANOVA indicated differences in satisfaction scores across cohorts ($F = 4.862$, $p = 0.002$). The reported LSD post hoc comparison found that the mean score for K23 (3.81) was higher than that for K21 (3.55).

Discussion

1. Explained variance and relative ordering of factors

The regression model explained 61.8% of the variance in satisfaction in the sample (adjusted $R^2 = 0.618$). This indicates that the five study factors jointly provided substantial information about variation in satisfaction scores in the current dataset. However, the explained variance does not mean that these factors caused 61.8% of satisfaction, nor does it guarantee the same level of explanation in another student sample. All five standardized regression coefficients were positive and statistically significant in the reported results ($p < 0.001$); VIF values below 2.0 indicate no evidence of severe multicollinearity by this diagnostic. Figure 1 summarizes the ordering of the β coefficients when all five factors were entered simultaneously. Standardized coefficients permit comparison of conditional associations among variables within this model: a one-standard-deviation increase in a factor is associated with a β-standard-deviation change in satisfaction, holding the other factors constant. These coefficients are not percentages of unique variance explained and do not establish causal effects.

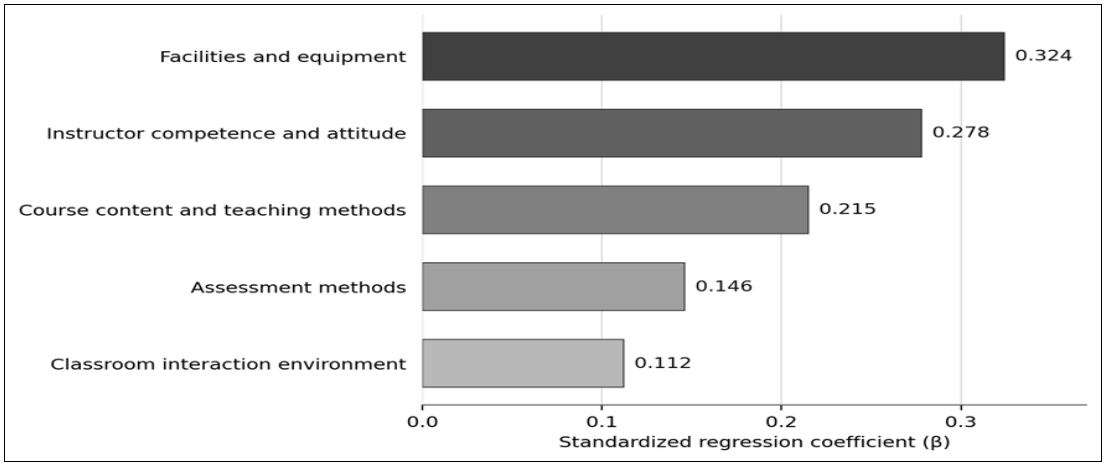


Fig 1: Standardized regression coefficients for factors associated with student satisfaction

Facilities and equipment had the largest coefficient (β = 0.324) and the strongest bivariate correlation with satisfaction (r = 0.614). Its mean score was 3.35, lower than the mean scores of the other factors in Table 3. These findings complement each other: facilities had the strongest relative association with satisfaction in the multivariable model, and students also gave this dimension the lowest descriptive rating. Given volleyball's need for courts, nets, and balls to support repeated practice, the availability and usability of equipment offer a plausible interpretation. However, the aggregate questionnaire does not identify which specific facility or item was lacking or inadequate. The results can therefore guide review priorities but cannot replace a direct inventory of facilities and equipment. Instructor competence and attitude ranked second (β = 0.278; r = 0.578), while its mean score was relatively high (4.02). A β coefficient lower than the bivariate correlation does not mean that instructors are less important; β reflects the association remaining after accounting for shared information with facilities, course content, and other factors. In motor-skill instruction, clear demonstrations, progressive guidance, timely feedback, and adaptation to students' skill levels may help learners understand tasks and practice safely. This interpretation is consistent with research on teacher-focused interventions to support autonomy in physical education (Cheon *et al*., 2012),[3] although the present study did not directly measure these specific teaching behaviors. Course content and teaching methods had β = 0.215 and a correlation with satisfaction of r = 0.542. The mean score of 3.78 indicates a moderately positive evaluation in the sample, while remaining below the instructor score. One possibility to examine is whether the learning experience depends on how class time is allocated among technical explanation, repeated practice, and application in game situations. Small-group drills or differentiated task difficulty may provide learners with more ball contacts; however, this is a pedagogical implication drawn from an association, not an intervention effect tested in this study. Assessment had β = 0.146 (r = 0.496), while the classroom interaction environment had β = 0.112 (r = 0.448). These coefficients were smaller than those of the other three factors, but remained positive and statistically significant in the model. They should therefore not be interpreted as unimportant. Publishing assessment criteria in advance, aligning them with technical objectives, and recognizing individual progress may clarify course expectations. Positive interaction between instructors and students, as well as among peers, may support relatedness and participation, consistent with the self-determination framework informing the study (Deci & Ryan, 2000; Vallerand, 2007).[5, 11] These mechanisms need to be measured directly in future research.

2. Group differences and relation to the analytical framework

Mean satisfaction did not differ significantly between men and women in the sample (p = 0.201). This indicates that the current analysis did not detect a gender difference; it does not demonstrate that the two groups had identical experiences in every respect. By cohort, ANOVA indicated an overall difference (F = 4.862; p = 0.002), and the reported LSD comparison identified a higher mean score for K23 (3.81) than for K21 (3.55). Because the manuscript does not provide all pairwise comparisons, effect sizes, or details about test assumptions, the results do not support a conclusion that satisfaction systematically increases or decreases by year of study. Cohort differences may reflect several contextual characteristics, but the available data do not identify their causes. Overall, examining instructors, course content, facilities, assessment, and interaction extends a higher-education service-quality perspective to the specific context of a practical sport course. This approach has points of convergence with service-quality frameworks such as SERVQUAL and HEdPERF, but the study scales were adapted to volleyball instruction; the findings do not constitute a full validation of the original models (Cronin & Taylor, 1992; Abdullah, 2006).[1, 4]

3. Limits to interpretation

The findings should be interpreted within the scope of a convenience sample of 1,000 students at one university, surveyed at one time point using self-reports. These features limit generalizability and do not establish causal direction; collecting all evaluations through one questionnaire may also introduce common-method effects. Future studies could use probability sampling or replicate the analysis across institutions, combine student perceptions with facility audits and actual participation records, and report confidence intervals and effect sizes for group comparisons. Such checks would help establish whether the relative ordering of factors is stable and clarify why facilities stood out in the present model.

Conclusion And Practical Implications

1. Conclusion

In the surveyed sample, 71.5% of students attended every class session, while 32.1% did not practice outside class. All five factors were positively associated with satisfaction, and the adjusted R^2 was 0.618. The standardized coefficients ranked from highest to lowest were facilities and equipment, instructor competence and attitude, course content and teaching methods, assessment, and the classroom interaction environment.

2. Practical implications

If confirmed, the findings suggest that the university and responsible units may consider the following actions: Review practice conditions: inspect court safety and surface grip, the condition of nets, and the number of balls; prioritize repair or replacement based on an actual inventory and class size. Use flexible teaching formats: increase small-group drills, movement games, and level-appropriate play to provide more opportunities for practice and interaction. Clarify assessment criteria: publish technical and attendance requirements and explain how progress is recorded, so students know the criteria before assessment. Support extracurricular activity: survey student interest before organizing clubs or internal tournaments, while considering schedules, court availability, and staffing.

3. Limitations and future research

The study was conducted at one university, relied on self-reported data, and used convenience sampling; these features limit generalizability. Its cross-sectional design also precludes causal conclusions. Future studies could use clearer probability-sampling plans, validate the

measurement scales in an independent sample, and use longitudinal or intervention designs when the aim is to assess effects.

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