

The Mediating Role of Customer Satisfaction Between Service Quality and Engagement in University Sports Centre

Peng, Zhao¹ & Jaffry, Zakaria^{1*}

¹Faculty of Sports Science and Coaching, Sultan Idris Education University, Tanjong Malim 35900, Malaysia

*Corresponding author email: jaffry@fsskj.upsi.edu.my

Received 28 September 2025, Revised 27 October 2025, Accepted 18 November 2025, Available online 21 November 2025

To link to this article: <https://doi.org/10.53797/ujssh.v4i2.29.2025>

Abstract: This study investigates the mediating role of customer satisfaction in the relationship between service quality and customer engagement among users of university sports center in China. Drawing on survey data from 288 students at one Sino-U.S. university, primarily freshmen and female students from Asia (84.4%), the research employs structural equation modeling to test the hypothesized relationships. Results reveal that service quality has a significant positive effect on both customer satisfaction and engagement, and that satisfaction partially mediates the link between service quality and engagement. These findings highlight the importance of not only delivering high-quality services but also fostering satisfaction to enhance active student involvement in campus recreation facilities. The study offers theoretical contributions to service management literature in higher education and provides actionable insights for the effective management of the university sports center.

Keywords: Service quality, customer satisfaction, customer engagement, mediation, university sports center

1. Introduction

The conceptual model guiding this study is anchored in established theories of service quality customer satisfaction, and customer engagement as shown in Figure 1. According to the service quality paradigm (Parasuraman et al., 1988; Zeithaml et al., 1996), service quality is a multidimensional construct encompassing program, interaction, outcome, and environment. These dimensions represent both tangible and intangible aspects that shape user perceptions in university sports settings (Ko & Pastore, 2005; Brady & Cronin, 2001).

Drawing on the expectancy-disconfirmation theory (Oliver, 1997), the model posits that students' evaluations of service quality influence their overall satisfaction. When service delivery meets or exceeds expectations, satisfaction increases, which in turn fosters greater engagement—a broad construct encompassing behavioural, attitudinal, and prosocial participation in campus sports activities (Hollebeek et al., 2014). Building on these classic models, more recent work in university sports services has confirmed that service quality significantly influences satisfaction and subsequent behavioural intentions (Calabuig-Moreno, et al., 2018).

The framework also incorporates a mediating mechanism, recognizing that service quality does not merely affect engagement directly; rather, its effect is channelled through satisfaction. This aligns with research in leisure and education contexts suggesting that satisfied users are more likely to display loyalty, cooperation, and proactive involvement (Alexandris et al., 2004; Zeithaml et al., 1996). Satisfaction has also been identified as a mediator linking service quality to engagement, particularly in recreational sports contexts, where engagement behaviours are shaped by affective evaluations of service experiences (Cuskelly et al., 2021). Recent structural equation modelling in university recreational sports has reinforced the mediating role of satisfaction, highlighting its importance for predicting student engagement.

Demographic factors—such as gender, class of study, and region—are included as control variables, as prior studies indicate these attributes may influence both perceptions of service quality and subsequent engagement behaviours (Tsitskari et al., 2014).

Overall, this theoretical framework positions customer satisfaction as a pivotal conduit through which multidimensional service quality is translated into meaningful student engagement. By empirically testing this mediation

model, the study seeks to provide nuanced insights into the customer experience journey in university sports centers and offer practical implications for service management in higher education.

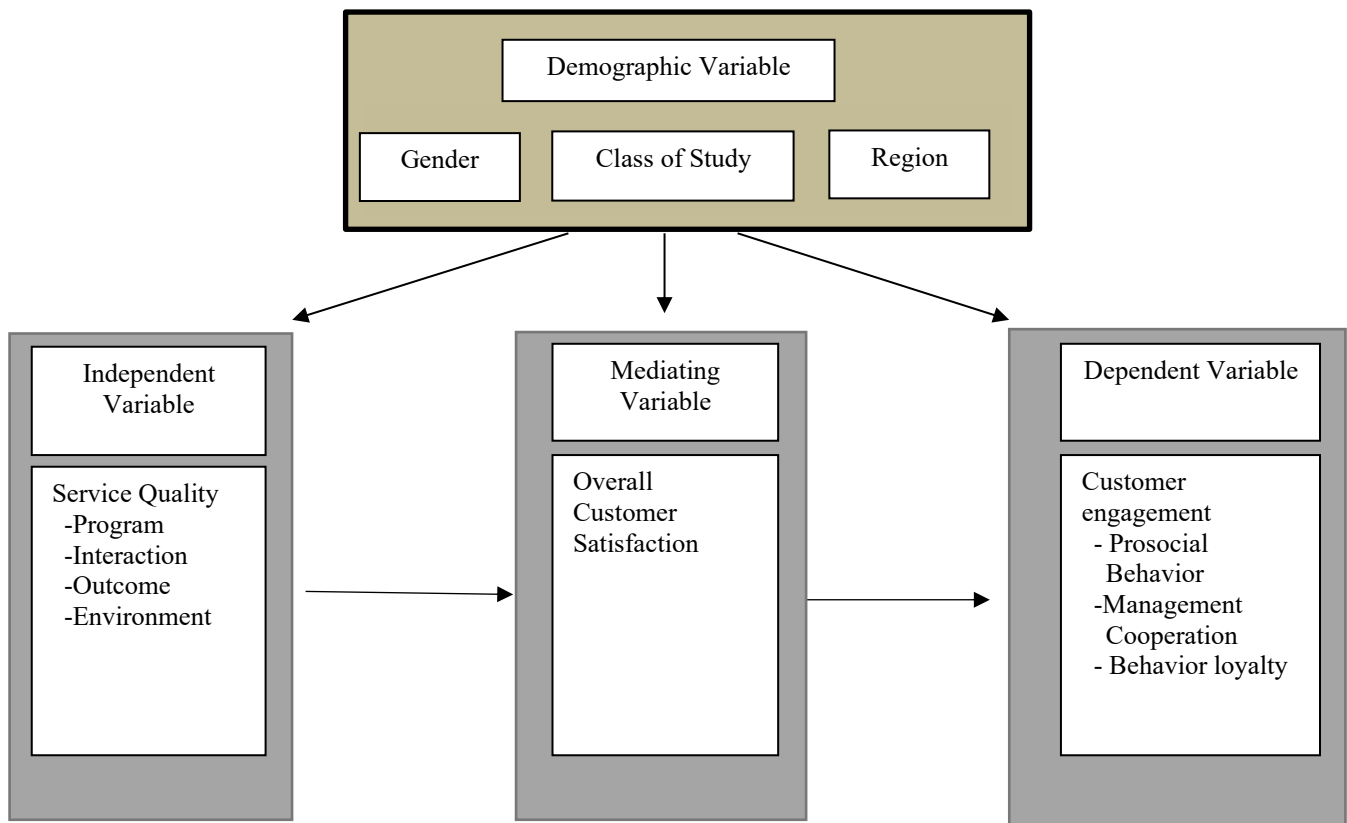


Figure 1. Research Model

2. Methodology

2.1 Data Source and Sample

Duke Kunshan University (DKU) Sports Centre was selected as the research context, which provide an ideal setting for exploring service quality and engagement in a globally diverse academic environment. As a joint venture between Duke University (USA) and Wuhan University (China), DKU reflects a blend of Eastern and Western educational models. By 2023, its student body represented over 40 countries, making it a microcosm of international higher education. This cultural and educational diversity likely shapes how students perceive and interact with campus services.

The Sports Centre serves as both a wellness hub and a space for cultural exchange, offering a wide range of activities from popular team sports like basketball to culturally rooted programs like Taiji. Its inclusive programming and international user base make it a fitting context for studying variations in service experience and engagement.

This research utilizes primary survey data collected from undergraduate students who regularly use university sports centres at a Sino-Foreign university in China. The data collection period spanned from March to May 2024. A total of **288 valid responses** were collected from university students using campus sports centres.

2.2 Measures

To ensure reliability and comparability with prior research, well-validated instruments were used for each key construct. Service quality was measured with an adapted version of the Single Item of Scale of Service Quality in Recreational Sports, containing 11 items that capture five core dimensions: program quality, interaction quality, outcome quality, and physical environment quality (Trail et al., 2023). The researcher adapted and modified 4 items from Cronin et al. (2000) and 1 item from Oliver (1997) to measure customer satisfaction (Cronin Jr et al., 2000; Oliver, 1997). The customer engagement questionnaire was adapted from previous studies (Yamaguchi et al., 2015; Yoshida et al., 2015) and measures customer engagement across three dimensions using 10 items. The dimensions include prosocial behaviour (4 items), management cooperation (4 items), and behavioural loyalty (2 items). This scale is designed to assess various aspects of participant behaviour in relation to the sports centre. The items were rated using a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

As shown in Table 1, all instruments demonstrated strong internal consistency, with Cronbach's alpha coefficients ranging from 0.88 to 0.93 across the three constructs. Confirmatory factor analysis further supported the convergent and discriminant validity of the scales, with standardized loadings above 0.70 and average variance extracted (AVE) exceeding 0.50 for each construct.

Table 1. Measurement Model Assessment

Construct	Items	Alpha	CR	AVE	Loading Range
Service Quality	11	0.91	0.92	0.68	.72–.88
Satisfaction	5	0.90	0.91	0.73	.81–.91
Engagement	10	0.88	0.89	0.66	.75–.87

2.3 Analytical Approach

Descriptive statistics were computed to summarize the sample profile and central tendencies for all major variables. Pearson correlations were calculated to assess the bivariate associations among service quality, satisfaction, and engagement.

Structural equation modelling (SEM) with maximum likelihood estimation was conducted using AMOS 26.0 to test the hypothesized relationships and mediation effect. Model fit was evaluated with standard indices: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). The mediation effect of customer satisfaction was tested using a bootstrapping procedure with 5,000 resamples to generate bias-corrected confidence intervals for the indirect effect. All analyses were performed at the 0.05 significance level.

3. Results

3.1 Descriptive Statistics

Demonstrating in Table 2, among the 288 participants, **192 were female (66.7%)** and **96 were male (33.3%)**. Regarding year of study, **freshmen accounted for the largest group (39.2%)**, followed by **sophomores (30.2%)**, **seniors (16.0%)**, and **juniors (14.6%)**. In terms of geographic origin, the majority of respondents were from **Asia (84.4%)**, with smaller proportions from **North America, Europe, or Australia (10.8%)**, **South America (4.2%)**, and **Africa (0.7%)**. This demographic distribution reflects a primarily Asian respondent base, with some global representation.

Table 2. Respondent Demographics Overview (n=288)

Category	Subcategory	Frequency	Percentage (%)
Year of Study	Freshman	113	39.2
	Sophomore	87	30.2
	Junior	42	14.6
	Senior	46	16.0
	Total	288	100.0
Gender	Male	96	33.3
	Female	192	66.7
	Total	288	100.0
Region	North America, Europe, Australia	31	10.8
	Asia	243	84.4
	Africa	2	0.7
	South America	12	4.2
	Total	288	100.0

The descriptive statistics for the main study variables are presented in Table 3. The mean score for **service quality** was 5.24 (SD = 1.15), for **customer engagement** was 5.06 (SD = 1.05), and for **customer satisfaction** was 5.88 (SD = 1.16), all on a 7-point Likert scale. These values suggest that students generally rated their perceptions of service quality, satisfaction, and engagement at the university sports centre as above average. Minimum and maximum values indicate that responses spanned the full-scale range for each construct.

Table 3. Descriptive Statistics for Main Study Variables (n = 288)

Variable	Mean (M)	SD	Minimum	Maximum
Service Quality	5.24	1.15	2.50	7.00
Customer Engagement	5.06	1.05	2.40	7.00
Customer Satisfaction	5.88	1.16	2.50	7.00

3.3 Structural Model Testing

Structural equation modelling revealed that service quality had a significant direct effect on customer satisfaction ($\beta = 0.57$, $p < 0.001$), and customer satisfaction had a significant direct effect on customer engagement ($\beta = 0.52$, $p < 0.001$) in Table 5. The direct path from service quality to engagement was also significant ($\beta = 0.29$, $p < 0.01$), though reduced in magnitude after accounting for the mediator. The model explained 46% of the variance in customer satisfaction and 54% in customer engagement.

Table 5. Structural Equation Modelling Results

Path	β	SE	p
Service Quality $\rightarrow$ Satisfaction	.57	.06	<.001
Satisfaction $\rightarrow$ Engagement	.52	.07	<.001
Service Quality $\rightarrow$ Engagement	.29	.09	.002
Indirect (Mediation) Effect	.30	.06	<.001

3.4 Mediation Analysis

The analysis incorporated bootstrapping and robust estimation where appropriate, especially in SEM, mediation, and moderation models. The results are summarized in Table 6. The total effect of service quality on customer engagement, accounting for customer satisfaction as a mediator, was significant (Estimate = 0.464, SE = 0.077, $p = 0.009$), indicating a strong overall association. The direct effect of service quality on engagement remained significant (Estimate = 0.392, SE = 0.090, $p = 0.004$), confirming that service quality directly contributes to customer engagement even after controlling for satisfaction.

Importantly, the indirect effect of service quality on engagement through customer satisfaction was also significant (Estimate = 0.072, SE = 0.035, $p = 0.008$), demonstrating a partial mediation effect. This indicates that while service quality has a direct influence on engagement, a portion of this effect operates through the mechanism of customer satisfaction. These findings reinforce the theoretical proposition that satisfaction serves as a key psychological conduit, translating service experiences into higher levels of student engagement within university sports centres.

Table 6. Mediation Effect Test

Path	Effect Type	Estimate	S.E.	P
SQ $\rightarrow$ CS $\rightarrow$ CE	Total Effect	0.464	0.077	0.009
SQ $\rightarrow$ CS $\rightarrow$ CE	Direct Effect	0.392	0.090	0.004
SQ $\rightarrow$ CS $\rightarrow$ CE	Indirect Effect	0.072	0.035	0.008

4. Discussion

This study provides empirical evidence on how customer satisfaction mediates the relationship between service quality and customer engagement in a university sports centre setting. The results affirm that service quality is a key driver of both satisfaction and engagement, in line with established findings in service management literature (Brady & Cronin, 2001; Ko & Pastore, 2005). Importantly, the significant indirect effect of service quality on engagement via satisfaction highlights that students' perceptions of high-quality services not only directly encourage active involvement but also foster satisfaction, which further translates into greater engagement. This is consistent with meta-analytic evidence showing that service quality is a robust predictor of fan engagement and behavioural intentions across diverse sport contexts.

These findings deepen our understanding of the psychological processes underlying student participation in campus recreation. The observed partial mediation indicates that while service quality has a direct impact on engagement, the pathway through satisfaction remains essential for explaining why students become more engaged. This supports expectancy-disconfirmation theory, suggesting that when university sports centres meet or surpass students' expectations for program quality, staff interaction, and environment, it boosts satisfaction, which in turn enhances behavioural, emotional, and attitudinal engagement (Oliver, 1999; Hollebeek et al., 2014).

From a theoretical perspective, the research underscores the importance of including mediating mechanisms such as satisfaction when modelling the drivers of student engagement in higher education services. By positioning satisfaction as a pivotal conduit between service quality and engagement, this study offers a more nuanced framework for future research on customer experience in educational and recreational contexts.

Practically, the findings underscore the necessity for university sports centre administrators to continuously invest in and monitor key dimensions of service quality, such as maintaining up-to-date facilities, enhancing staff-student interactions, and providing responsive support. Regular assessment of both service quality and student satisfaction can help managers identify specific areas for improvement that are most likely to foster ongoing engagement. The partial nature of the mediation also suggests that other factors such as peer influence, personal motivation, or institutional culture may further shape engagement outcomes and warrant further study. Similarly, previous research shows that student loyalty in sports services is primarily shaped by satisfaction and engagement, reinforcing the managerial importance of enhancing these constructs within university contexts.

In summary, this research highlights the intertwined roles of service quality and satisfaction in cultivating meaningful and sustained student engagement in university recreational sports settings.

5. Conclusion

This study investigated the mediating effect of customer satisfaction on the relationship between service quality and customer engagement among university sports center users. Drawing on data from a diverse student sample and applying structural equation modelling, the findings demonstrate that service quality significantly enhances both satisfaction and engagement, with satisfaction serving as a partial mediator. These insights enrich our theoretical understanding of how service experiences translate into user involvement within campus recreation.

For practitioners, the results emphasize that investments in improving service quality can generate higher satisfaction and, consequently, deeper student engagement. Ongoing attention to the factors that drive both satisfaction and service excellence is essential for sustaining vibrant and inclusive sports centres in higher education. Future research is encouraged to examine additional mediators or moderators—such as motivation, peer support, or cultural background—to further advance the understanding of student engagement mechanisms in university contexts.

Acknowledgement

The authors extend their sincere gratitude to Duke Kunshan University for its generous provision of research facilities and administrative support, without which this study would not have been possible.

Conflict of Interest

The authors declare no conflicts of interest.

References

- Alexandris, K., Zahariadis, P., Tsorbatzoudis, C., & Grouios, G. (2004). An empirical investigation of the relationships among service quality, customer satisfaction and psychological commitment in a health club context. *European Sport Management Quarterly*, 4(1), 36–52. <https://doi.org/10.1080/16184740408737466>
- Brady, M. K., & Cronin, J. J. (2001). Some new thoughts on conceptualizing perceived service quality: A hierarchical approach. *Journal of Marketing*, 65(3), 34–49. <https://doi.org/10.1509/jmkg.65.3.34.18334>
- Calabuig-Moreno, F., Núñez-Pomar, J., Prado-Gascó, V., & Añó-Sanz, V. (2018). The effect of service quality on behavioral intentions in university sports services: Mediating role of satisfaction. *Journal of Physical Education and Sport*, 18(3), 1460–1467. <https://doi.org/10.7752/jpes.2018.03214>
- Cuskelly, G., Fredline, L., Kim, E., Barry, S., & Kappelides, P. (2021). Volunteer selection at a major sport event: A strategic Human Resource Management approach. *Sport Management Review*, 24(1), 116–133. <https://doi.org/10.1016/j.smr.2020.02.002>
- Cronin Jr, J. J., Brady, M. K., & Hult, G. T. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76(2), 193–218. [https://doi.org/10.1016/S0022-4359\(00\)00028-2](https://doi.org/10.1016/S0022-4359(00)00028-2)
- Hollebeek, L. D., Glynn, M. S., & Brodie, R. J. (2014). Consumer brand engagement in social media: Conceptualization, scale development and validation. *Journal of Interactive Marketing*, 28(2), 149–165. <https://doi.org/10.1016/j.intmar.2013.12.002>
- Ko, Y. J., & Pastore, D. L. (2005). A hierarchical model of service quality for the recreational sport industry. *Sport Marketing Quarterly*, 14(2), 84–97.
- Oliver, R. L. (1997). *Satisfaction: A behavioral perspective on the consumer*. McGraw-Hill.
- Oliver, R. L. (1999). Whence consumer loyalty? *Journal of Marketing*, 63, 33–44. <https://doi.org/10.2307/1252099>
- 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.

- Tsitskari, E., Tsiotras, D., & Tsiotras, G. (2014). Measuring service quality in sport services. *Total Quality Management & Business Excellence*, 25(3–4), 294–307. <https://doi.org/10.1080/14783363.2012.756749>
- Trail, G. T., Lee, S., Lee, J. S., & Kingston, J. (2023). A practical guide to the use of single-item measures in sport management research.
- Yamaguchi, S., Akiyoshi, R., Yamaguchi, Y., & Nogawa, H. (2015). Assessing the effects of service quality, past experience, and destination image on behavioral intentions in the spring training camp of a Japanese professional baseball team. *Journal of Convention & Event Tourism*, 16(3), 229–249. <https://doi.org/10.1080/15470148.2015.1050436>
- Yoshida, M., Heere, B., & Gordon, B. (2015). Predicting behavioral loyalty through community: Why other fans are more important than our own intentions, our satisfaction, and the team itself. *Journal of Sport Management*, 29(3), 318–333. <https://doi.org/10.1123/jsm.2013-0306>
- Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioral consequences of service quality. *Journal of Marketing*, 60(2), 31–46. <https://doi.org/10.1177/002224299606000203>