



Empirical Analysis of Key Drivers of Student Satisfaction with University Catering Services: Application of the SERVQUAL Model

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Abstract. Research Background and Purpose: University student cafeterias serve as vital logistical hubs supporting academic and research activities, where service quality directly impacts student satisfaction and campus belongingness. Using the 'Cheery World' cafeteria in Building O of Macau University of Science and Technology as a case study, this research employs the SERVQUAL model to diagnose service quality gaps and identify key drivers influencing overall student satisfaction. Our researching method focused on SERVQUAL evaluation framework, which was constructed, which included five dimensions: tangibility, reliability, responsiveness, assurance, and empathy.

Our study has found three-dimensional discoveries: Firstly, students' perceived service quality in the cafeteria generally falls short of expectations, particularly in assurance and reliability. Secondly, regression analysis revealed that responsiveness ($P=0.455$, $p<0.001$) is the strongest predictor of overall student satisfaction among the five SERVQUAL dimensions, demonstrating significantly greater explanatory power than other dimensions. Thirdly, correlation analysis confirmed strong positive correlations between responsiveness and reliability/assurance ($r>0.7$, $p<0.001$), indicating significant interactive effects among service dimensions.

What's else, this study theoretically elucidates the pivotal role of responsiveness in university cafeteria services and its synergistic relationships with other service dimensions. Practically, it provides concrete recommendations for cafeteria managers, including establishing a "feedback-response" closed-loop management system, optimizing resource allocation during peak hours, and empowering frontline staff. These findings offer data-driven decision-making support for enhancing catering service quality in similar higher education institutions.

Keywords: SERVQUAL model; university cafeteria; service quality; student satisfaction; responsiveness

1 Introduction

1.1 Research Background and Significance

As a high-frequency, high-contact service venue, university student cafeterias not only meet the basic living needs of faculty and students but also play a pivotal role in fostering a harmonious campus atmosphere and strengthening organizational identity. In today's increasingly competitive higher education landscape, the quality of logistical services has become a key indicator of a university's overall operational standards. As one of Macau's leading comprehensive universities, the University of Macau Science and Technology hosts over 20,000 students with diverse backgrounds and flexible schedules, imposing stringent demands on campus dining services. The "Cheese Art World" cafeteria in Building O, as one of the university's core dining facilities, holds significant research value due to its exceptional service quality.^[1]

However, like many university cafeterias, the O Building cafeteria inevitably faces operational challenges such as seat shortages during peak hours, slow menu updates, and inefficient student feedback processing. These issues highlight the urgent need to systematically evaluate and optimize service quality through scientific management tools. Traditional management practices often rely on subjective judgments, lacking data support and systematic analysis. Therefore, applying established service quality models for precise service diagnosis holds significant practical value.^[2]

Theoretically, this study aims to advance the application of the SERVQUAL model in specific service scenarios. Proposed by Parasuraman et al., the SERVQUAL model quantifies service quality by measuring the gap between customer expectations and actual perceptions, standing as one of the most influential theoretical frameworks in service management. Although widely used in industries like banking and retail, domestic research on its application in university dining services has predominantly focused on descriptive analyses of service quality gaps, lacking in-depth exploration of how service quality dimensions interact and which factors critically drive overall satisfaction. This study not only employs the SERVQUAL model for diagnostic analysis but also investigates structural relationships among the five dimensions and their relative importance to overall satisfaction through correlation and regression analyses. By addressing existing research gaps, this work provides new empirical evidence supporting the applicability of SERVQUAL theory in specific contexts.

1.2 Research Content and Framework

This study focuses on improving the service quality of the O-Building Restaurant at Macau University of Science and Technology. Using the SERVQUAL model, the main research contents include: a systematic review of the SERVQUAL model, customer satisfaction theory, and the current status of research on canteen satisfaction in domestic and international universities, clarifying the theoretical positioning and innovative points of this study; applying the classic SERVQUAL scale to the operating environment of the O-Building Restaurant, designing a questionnaire and collecting data using a mixed online and offline sampling method; using SPSS software to conduct reliability

and validity tests, descriptive statistics, Pearson correlation analysis, and multiple linear regression analysis on the sample data, examining the independent and combined effects of each service quality dimension on overall satisfaction, and verifying the core role of the "responsiveness" dimension; based on the data analysis results, exploring the management implications of the research findings, and proposing a systematic and operable service quality improvement plan for the O-Building Restaurant.

1.3 Research Methods and Technical Approaches

This study employs a mixed research approach, primarily using quantitative analysis supplemented by qualitative analysis. The research content includes: first, a systematic literature review of the SERVQUAL model, university service quality, and student satisfaction to lay the theoretical foundation; second, a questionnaire designed based on the five dimensions of SERVQUAL, using a five-point Likert scale to measure students' service expectations (E) and perceptions (P); and finally, statistical analysis of the questionnaire data using SPSS 31.0 software, including: descriptive statistics to calculate E, P, and the gap ($SQ = P - E$); Pearson/Spearman correlation analysis to analyze the correlation between dimensions; and multiple linear regression and stepwise regression analysis to determine the predictive power of each dimension on overall satisfaction. The study follows a clear process: first, building the model and hypotheses based on the theoretical review; second, collecting primary data through rigorous questionnaire design; third, testing the hypotheses using statistical tools; and finally, drawing conclusions and proposing management recommendations based on the empirical results.

2 Literature Review and Theoretical Basis

2.1 Theoretical Connotation and Development of SERVQUAL Model

The SERVQUAL model (Service Quality Gap Model) is grounded in a fundamental principle: service quality is not a single-dimensional concept, but rather the gap between customers' "expectations" before receiving service and their "perceptions" afterward. This model breaks down abstract service quality into five measurable dimensions: tangibility (facilities, equipment, and staff image), reliability (the ability to accurately fulfill service commitments), responsiveness (willingness to assist customers and provide timely service), assurance (employees' knowledge, courtesy, and ability to earn trust), and empathy (personalized care for customers). The model evaluates service quality by measuring customers' expected scores (E) and perceived scores (P) across these dimensions, then calculating the gap score ($SQ = P - E$). A negative SQ value indicates that perceived service quality falls short of expectations, signaling a service quality gap.

2.2 Theoretical Correlation Between Customer Satisfaction and Service Quality

The SERVQUAL model's core logic of the "expectation-perception" gap aligns closely with the widely accepted "expectation confirmation theory" in customer satisfaction research. This theory posits that customer satisfaction arises from comparing the actual performance of a product or service with pre-purchase expectations. Customers feel satisfied when perceived performance exceeds expectations, and dissatisfied when it falls short. Thus, service quality serves as a key antecedent for customer satisfaction.

Subsequent researchers have continuously advanced the development of service quality theory. For instance, Brady and Cronin proposed a multi-level, multi-dimensional service quality model, emphasizing the hierarchical structure and interactions among dimensions. They argued that evaluating service quality should not be confined to isolated comparisons of individual dimensions, but must also examine how these dimensions collectively influence overall assessment and whether certain dimensions play a dominant role. This study introduces the SERVQUAL framework and adopts this structural perspective, aiming to reveal the relative importance of each dimension and their interactive mechanisms in the specific service scenario of university cafeterias.

2.3 Application and Limitations of SERVQUAL Model in University Canteen Research

The SERVQUAL model has become a widely adopted research methodology for evaluating university cafeteria service quality by scholars globally. For instance, Guo Lei (2018) applied this model to analyze the student cafeteria at Changzhou Textile Institute, calculating the overall service quality score (SQ) and identifying areas for improvement in aspects such as dish taste and hygiene. Similarly, Wang Xinying (2021) utilized the model to identify issues in pricing, spatial design, and feedback channels at a university cafeteria.^[3]

However, a comprehensive review of existing research reveals two critical limitations. Firstly, most studies focus on descriptive diagnosis of service gaps using SQ scores, lacking in-depth validation of which of the five dimensions most significantly impacts overall satisfaction. Secondly, there is insufficient exploration into whether intrinsic correlations exist between dimensions and how these correlations influence customers' overall perception. Addressing these questions is crucial for managers to prioritize resource allocation. Therefore, this study builds upon these research limitations with targeted improvements. It not only conducts gap analysis under the SERVQUAL model but also identifies key driver dimensions through further quantitative analysis and examines their interrelationships, aiming to provide more targeted data-driven conclusions and management recommendations.

3 Research Design and Methods

Based on the literature review and research objectives, this study constructs the following conceptual model: using the five dimensions of the SERVQUAL model (tangibility, reliability, responsiveness, assurance, and empathy) as independent variables, and student satisfaction with service quality as the dependent variable.

Based on this, the following research hypotheses are proposed:

H1: All five dimensions of the SERVQUAL model significantly enhance overall service quality satisfaction in university student cafeterias.

H2: Among the five dimensions, responsiveness has the most significant impact on overall service quality satisfaction.

H3: Reliability and responsiveness are correlated.

H4: There is a correlation between empathy and responsiveness.

H5: There is a correlation between assurance and responsiveness.

H6: There is a correlation between tangibility and responsiveness.

Data collection was conducted from October to November 2024 using random sampling methods, combining online (Questionnaire Star platform) and offline (O-seat restaurant entrance) approaches. A total of 120 questionnaires were collected, with 110 valid samples obtained after excluding invalid responses, yielding an effective response rate of 91.67%. The sample size met the basic requirements for regression analysis, covering students with different meal times and dietary habits, demonstrating strong representativeness.

4 Data Analysis and Results

4.1 Descriptive Statistics and Service Quality Gap Analysis

The mean values of expected scores (E), perceived scores (P), and gap scores ($SQ = P - E$) were calculated. Data revealed that 14 out of 16 items showed negative SQ values, confirming that students' service perception at Restaurant O was generally below expectations, indicating a widespread service quality deficit. Notably, items such as 'food hygiene' and 'value for money of dishes' exhibited particularly significant gaps ($SQ < -1.0$), making them key areas requiring urgent improvement.^[4]

4.2 Relevance Analysis

To comprehensively evaluate Hypotheses H3-H6, we utilized the same survey data (N=110) and calculated correlation coefficients between responsiveness and other dimensions using Pearson and Spearman correlation analyses. All correlations reached statistical significance ($p < 0.001$), strongly rejecting the null hypothesis (no correlation) and thereby validating the validity of H3, H4, H5, and H6. Specifically, reliability and assurance demonstrated strong positive correlations with responsiveness, while empathy and tangibility showed moderate positive correlations with responsiveness.

4.3 Regression Analysis

A multiple linear regression analysis was conducted with overall satisfaction as the dependent variable and the perceived values (P) across five dimensions as independent variables. The initial entering method model exhibited collinearity issues, with only the responsiveness dimension showing statistical significance ($p < 0.05$), while the other four dimensions failed to demonstrate significant results. Consequently, we employed stepwise regression to identify key variables. Ultimately, only the responsiveness dimension was retained in the model.

The adjusted model used overall satisfaction as the dependent variable and perceived responsiveness (P) as the independent variable. The model was statistically significant ($F = 28.255$, $p < 0.001$), with an adjusted R^2 of 0.200, indicating that responsiveness alone explained 20% of the variance in overall satisfaction. The nonstandardized coefficient B for the responsiveness dimension was 0.368 ($p < 0.001$), and the standardized coefficient Beta was 0.455 ($p < 0.001$).

The analysis results strongly support Hypothesis H2, indicating that responsiveness is the most significant factor influencing overall satisfaction with a positive effect. Hypothesis H1 is partially supported (only responsiveness is retained), and the correlation relationships among Hypotheses H3-H6 are also supported.

5 Discussion and Recommendations

The study's most significant finding confirms the pivotal role of responsiveness in university dining services. This insight is explained through service marketing and consumer behavior perspectives. First, contemporary college students—digital natives—have grown up in a culture of instant feedback, expecting greater efficiency, transparency, and interactivity. Second, according to the "service recovery paradox," when service failures are unavoidable, efficient and sincere recovery responses may actually enhance customer satisfaction and loyalty.^[5] At O Restaurant, common service failures like peak-hour crowding and menu shortages, when addressed with responsiveness. In addition, The H3-H6 findings demonstrate that service quality dimensions are not isolated. The positive correlation between peak-hour seating capacity and responsiveness ratings exemplifies the classic "halo effect." Under service pressure, performance in one dimension can influence perceptions of others. A crowded environment inherently triggers negative emotions, and when complaints are unaddressed and communication is hindered, the negative experience is amplified. What's more, The systemic crisis from "service gap" to "trust gap": A glaring disparity in service quality—articularly in complaint resolution and trust-building—has exposed a systemic trust crisis. Students' dissatisfaction may stem from specific issues, but when response mechanisms fail, it escalates into a sense of helplessness due to "no complaints channel," ultimately eroding overall trust in the restaurant's management. This vicious cycle of "problems occurring f ineffective feedback f trust erosion f silent dissatisfaction" represents the core challenge that restaurant managers must address.^[6]

6 Conclusions

This study draws the following conclusions through empirical analysis from 3 perspectives:

Firstly, The service quality of the O Building restaurant at Macau University of Science and Technology falls short across the board, failing to meet students' expectations, particularly in terms of reliability and assurance.

Secondly, Among the five dimensions of the SERVQUAL model, responsiveness is the most significant factor in driving overall student satisfaction, with its predictive power significantly out-performing the other dimensions.

Thirdly, There exists a strong interactive relationship among service quality dimensions. Students' perceptions of reliability, tangibility, assurance, and empathy during peak hours are significantly correlated with responsiveness. We believe that responsiveness directly enhances users' perception of reliability, empathy, assurance, and tangibility through timely feedback and problem resolution. This also reflects the holistic and context-dependent nature of service quality. However, our research has existed some limitations: Firstly, the sample size is relatively small, which could be expanded to multi-campus or multi-type universities for comparative studies in the future. Secondly, the questionnaire design did not ensure equal item counts across all dimensions. Finally, future research could explore differences in service quality expectations and perceptions among different student groups to achieve more refined management. Additionally, the key construct of "responsiveness" could be further decomposed into sub-dimensions for in-depth investigation.

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