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Service Quality And User Satisfaction In College Transportation Systems An Empirical Study On Operational Efficiency And Behavioral Outcomes

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Abstract: Transportation services within higher educational institutions play a vital role in shaping the daily academic experience of students and staff. Efficient and reliable transport systems contribute significantly to punctuality, attendance, safety and overall institutional effectiveness. This study empirically examines the relationship between transportation service quality and satisfaction among users in a higher education setting and evaluates how satisfaction influences behavioural intentions such as service recommendation and continued usage. Using primary data collected from 410 respondents through a structured questionnaire, the study applies descriptive statistics, correlation analysis, regression modelling and chi-square testing to analyse the strength and direction of relationships between service quality dimensions and user satisfaction. The findings reveal a strong positive relationship between perceived service quality and overall satisfaction, with service quality explaining a substantial proportion of variance in satisfaction levels. Furthermore, satisfaction demonstrates a significant association with recommendation intentions, indicating its role as a mediator between service performance and behavioural outcomes. The study contributes to service quality literature by extending empirical validation to institutional transportation systems and provides actionable insights for administrators seeking to enhance operational efficiency through quality-focused transport management strategies.

1. Introduction

Transportation services constitute a foundational support system within higher educational institutions, particularly in regions where students and staff depend heavily on institution-operated transport for daily commuting. The effectiveness of these services directly influences punctuality, attendance regularity, physical well-being and overall satisfaction with the academic environment. Unlike optional campus services, transportation systems operate as essential infrastructure and any deficiency in their performance can lead to cascading operational inefficiencies. In recent years, the scale and complexity of institutional transportation systems have increased due to growing enrolments, expanding geographic catchment areas and heightened expectations regarding safety, comfort and reliability. As institutions strive to improve academic outcomes and operational performance, transportation quality has emerged as a critical yet under-researched determinant of user satisfaction. Service quality in transportation extends beyond mere vehicle availability. It encompasses multiple dimensions including punctuality, route consistency, safety, driver professionalism, communication, cleanliness, comfort and overcrowding management. Users evaluate transportation experiences holistically, forming satisfaction judgments that influence not only continued usage but also institutional perception and word-of-mouth communication. Despite its importance, transportation service quality is often managed reactively rather than strategically. Many institutions focus on cost containment while underestimating the long-term impact of service deficiencies on user satisfaction and operational efficiency. Delays in

transportation can result in late class commencements, reduced instructional time, administrative disruptions, and increased stress among users. Conversely, a well-managed transport system can enhance discipline, improve attendance and support smoother academic operations. This study seeks to address this gap by empirically examining the relationship between transportation service quality and satisfaction within a higher education context. By analysing user perceptions and behavioural outcomes, the research aims to provide evidence-based insights that can inform transport management policies and institutional decision-making.

1.1 Background of the Study

Institutional transportation systems operate at the intersection of service management and operational logistics. Unlike public transportation, institutional transport users typically have limited alternatives, making service quality a critical determinant of satisfaction rather than choice. Students and staff often rely on these services daily, creating repeated exposure that amplifies both positive and negative experiences. Previous studies in service management literature emphasize that perceived service quality is a stronger predictor of satisfaction than objective service attributes. In transportation contexts, perceptions of punctuality, safety, and comfort often outweigh actual travel time or distance. This perception-driven evaluation underscores the need for institutions to understand how users experience transport services rather than relying solely on operational metrics. Moreover, transportation services influence broader institutional outcomes. Persistent delays can undermine academic discipline, reduce instructional effectiveness and negatively affect staff productivity. Conversely, reliable transport supports structured schedules, enhances attendance consistency, and contributes to a positive campus climate. Despite these implications, empirical research focusing specifically on transportation service quality within higher education institutions remains limited, particularly in developing country contexts. Existing studies often examine public transit systems or commercial transportation services, leaving a research gap in institutional service environments where operational goals differ from profit-driven models.

1.2 Problem Statement

Higher educational institutions invest substantial resources in transportation infrastructure, yet user dissatisfaction remains a recurring concern. Common issues include inconsistent schedules, overcrowding during peak hours, inadequate communication regarding delays and varying standards of vehicle comfort and cleanliness. These challenges not only affect user satisfaction but also disrupt institutional operations. The absence of systematic evaluation mechanisms often prevents administrators from identifying which service quality dimensions most strongly influence satisfaction. Without empirical evidence, improvement initiatives may be misaligned with user priorities, resulting in inefficient resource allocation. Furthermore, while satisfaction is frequently measured, its relationship with behavioural outcomes such as service recommendation and continued usage is rarely quantified in institutional transportation contexts. Understanding this relationship is essential for assessing the broader impact of service quality on institutional reputation and user loyalty. This study addresses these challenges by investigating the relationship between transportation service quality, user satisfaction and behavioural intentions using quantitative analytical techniques.

1.3 Objectives of the Study

The main objectives of this study are:

1. To assess user perceptions of transportation service quality within a higher education institution.
2. To study how service quality dimensions relate to overall user satisfaction.
3. To identify the extent to which service quality predicts satisfaction levels.
4. To analyse the association between satisfaction and service recommendation intentions.
5. To provide evidence-based recommendations for improving transportation service management and operational efficiency.

1.4 Research Questions

The study is based on the following research questions:

- What is the relationship between perceived transportation service quality and overall user satisfaction?
- Which service quality dimensions most strongly influence satisfaction?
- Does user satisfaction significantly affect recommendation intentions?
- Do demographic factors such as gender, year of study, or commute duration moderate satisfaction levels?

1.5 Significance of the Study

This research contributes to both academic literature and institutional practice. From an academic perspective, it extends service quality theory to institutional transportation systems, providing empirical validation within a non-commercial service environment. The findings enhance understanding of how service quality perceptions translate into satisfaction and behavioural outcomes. From a practical standpoint, the study offers administrators a structured framework for evaluating transportation services based on user priorities. By identifying critical service dimensions, the research supports targeted improvement initiatives that can enhance operational efficiency, user satisfaction and institutional effectiveness.

2. Literature Review

The literature review establishes the theoretical foundation for examining transportation service quality and user satisfaction within higher educational institutions. It synthesizes prior research on service quality frameworks, transportation satisfaction models, institutional service environments and behavioural outcomes, while identifying gaps that justify the present study.

2.1 Concept of Service Quality

Service quality is a multidimensional construct that reflects the extent to which a service meets or exceeds user expectations. Unlike tangible products, services are characterized by intangibility, heterogeneity, inseparability and perishability, making quality assessment inherently perception-based. Early service quality research emphasizes the comparison between expected and perceived service performance as the basis for satisfaction formation. The SERVQUAL framework remains one of the most widely adopted models for measuring service quality. Service quality is explained through five dimensions: reliability, responsiveness, assurance, empathy, and tangibility. While originally developed for commercial services, subsequent research has adapted these dimensions to public and institutional service contexts, including transportation systems. In transportation services, reliability and tangibility often assume greater importance due to safety considerations and frequent usage. Studies indicate that consistent performance and physical comfort significantly shape users' overall service evaluations. However, scholars caution that service quality dimensions must be contextualized rather than applied mechanically across sectors.

2.2 Transportation Service Quality

Transportation services present unique challenges in service quality management due to their operational complexity and environmental dependence. Factors such as traffic conditions, vehicle maintenance, route design, and human behaviour introduce variability that directly affects user perceptions. Research on public and private transportation systems identifies punctuality, safety, comfort and information availability as core determinants of perceived quality. Unlike leisure or discretionary services, transportation users often evaluate quality based on risk avoidance and time efficiency rather than enjoyment alone. This utilitarian orientation intensifies dissatisfaction when expectations are unmet. Empirical studies consistently report strong positive relationships between perceived transportation service quality and user satisfaction. However, the relative importance of specific dimensions varies across contexts. For example, in urban public transit systems, overcrowding and delay frequency dominate satisfaction judgments, whereas in institutional transport settings, safety and schedule reliability often take precedence.

2.3 Service Quality in Higher Educational Institutions

Higher educational institutions deliver a wide range of support services beyond academic instruction, including housing, food services, healthcare, and transportation. These services significantly influence students' overall institutional experience and perceptions of value. Institutional services differ from commercial services in several ways. Users typically lack alternative providers, service usage is mandatory rather than optional and pricing mechanisms are indirect. These factors shape satisfaction formation and behavioural responses, often reducing exit options while increasing sensitivity to service quality variations. Transportation services in educational institutions are particularly critical due to their direct link to attendance and academic participation. Poor transportation performance can undermine institutional objectives by affecting punctuality, concentration and staff productivity. Despite this importance, transportation services are frequently evaluated using operational metrics rather than user-cantered quality assessments.

2.4 Student and Staff Satisfaction

Satisfaction is commonly defined as a psychological state resulting from the comparison of expectations with perceived performance. In institutional contexts, satisfaction reflects not only service experience but also perceived fairness, reliability, and institutional support. Research indicates that satisfaction in educational environments influences a range of outcomes, including academic engagement, institutional loyalty and positive word-of-mouth. Students who perceive support services as reliable and responsive are more likely to develop favourable attitudes toward the institution as a whole. Staff satisfaction with transportation services is equally important, as delays and discomfort can affect teaching effectiveness, administrative coordination, and workplace morale. However, empirical studies often focus primarily on student perspectives, leaving staff experiences underexplored.

2.5 Behavioural Intentions and Recommendation

Behavioural intentions represent the likelihood that users will engage in future behaviours such as continued usage, positive recommendation or advocacy. In service research, satisfaction is widely recognized as a key predictor of behavioural intentions. The satisfaction recommendation relationship has been extensively studied in commercial services, where satisfied customers are more likely to recommend services to others. In institutional transportation contexts, recommendation behaviour may appear less relevant due to limited choice, yet it remains an important indicator of perceived service value and institutional reputation. Studies suggest that even in constrained-choice environments, satisfied users express higher levels of trust and positive communication, which can influence institutional image among prospective users and stakeholders.

2.6 Theoretical Framework

This study draws upon the Customer Satisfaction Model, which posits that perceived service quality influences satisfaction, which in turn shapes behavioural intentions. The model emphasizes satisfaction as a mediating variable rather than a direct outcome of service quality alone. In the context of institutional transportation, the framework suggests that improvements in service quality dimensions such as punctuality, comfort, safety and communication enhance satisfaction, which subsequently increases the likelihood of positive behavioural responses.

The conceptual pathway underlying this study is:

Transportation Service Quality → User Satisfaction → Behavioural Outcomes

This framework provides a logical basis for hypothesis formulation and empirical testing.

2.7 Research Gap

Despite extensive research on service quality and satisfaction, several gaps remain:

1. **Contextual Gap:** Most transportation service quality studies focus on public or commercial transit systems, with limited attention to institutional transportation environments.

2. **Methodological Gap:** Many studies rely on descriptive analysis without employing advanced statistical models to quantify predictive relationships.

3. **Behavioural Gap:** The mediating role of satisfaction in shaping recommendation intentions is underexplored in institutional contexts.

4. **Operational Gap:** Few studies translate empirical findings into actionable operational strategies for institutional administrators.

The present study addresses these gaps by empirically examining service quality, satisfaction and behavioural intentions within a higher education transportation system using robust quantitative methods.

3. Conceptual Framework and Research Methodology

This section presents the conceptual foundation and methodological approach adopted for the study. It explains the analytical framework, research design, sampling strategy, data collection instruments, reliability measures and ethical considerations underlying the empirical investigation.

3.1 Conceptual Framework

The conceptual framework of this study is grounded in service quality theory and satisfaction research. It proposes that perceived transportation service quality directly influences user satisfaction, which in turn affects behavioural intentions such as service recommendation and continued usage. Transportation service quality is treated as a multidimensional construct comprising attributes related to operational performance and user experience. These include punctuality, route consistency, safety, comfort, cleanliness, communication effectiveness and crowd management. User satisfaction represents an overall evaluative judgment formed through repeated service encounters. Behavioural intention reflects users' propensity to express positive opinions and recommend the service to others. The framework assumes satisfaction to be a mediating variable rather than an endpoint. This mediating role aligns with established service management theories suggesting that quality perceptions shape satisfaction, which subsequently determines behavioural outcomes. The framework also allows for the examination of demographic factors as control variables, acknowledging potential differences in perception across user groups.

Conceptual Relationship:

Service Quality Dimensions → User Satisfaction → Behavioural Intentions
(Control Variables: Gender, Academic Status, Commute Duration)

3.2 Research Design

The study uses a descriptive analytical design based on quantitative methods. This design is appropriate for examining relationships between variables and testing theoretically grounded hypotheses using empirical data. A cross-sectional survey method was adopted to capture user perceptions at a single point in time. While longitudinal designs offer advantages in causal inference, cross sectional analysis is suitable for identifying patterns, associations and predictive relationships within institutional service environments where large-scale experimentation is impractical.

3.3 Population and Sampling

3.3.1 Target Population

The target population for the study comprises all students and staff members who regularly utilize the transportation services of a higher educational institution. This includes undergraduate students, postgraduate students, teaching faculty and non-teaching staff.

3.3.2 Sample Size

A total of 410 valid responses were obtained and included in the analysis. The sample size exceeds minimum statistical requirements for regression and correlation analysis, ensuring sufficient power to detect meaningful relationships among variables.

3.3.3 Sampling Technique

A non-probability convenience sampling method was employed due to accessibility constraints and the voluntary nature of survey participation. While this approach limits generalizability, it is commonly used in institutional service studies and is appropriate for exploratory and predictive analyses. Efforts were made to ensure representation across different academic levels and user categories to reduce sampling bias.

3.4 Instrument Design

Data were collected using a structured questionnaire designed specifically for this study. The instrument was developed based on established service quality literature and adapted to the institutional transportation context.

3.4.1 Structure of the Questionnaire

The questionnaire had five sections:

1. **Demographic Information**
Gender, academic status, and average commute duration.

2. **Transportation Service Quality Dimensions**
Multiple items measuring perceptions of punctuality, safety, comfort, cleanliness, communication and operational reliability.

3. **Overall Satisfaction**
A global satisfaction measure capturing users' overall evaluation of transportation services.

4. **Behavioural Intentions**
Items measuring the likelihood of recommending the transportation service.

5. **Open-Ended Feedback**
Qualitative responses capturing perceived problems and improvement suggestions.

3.4.2 Measurement Scale

Most items were measured using a five-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5). Satisfaction and recommendation intentions were similarly measured on five-point ordinal scales.

3.5 Reliability and Validity

3.5.1 Reliability Analysis

Internal consistency reliability of the service quality dimension items was evaluated using Cronbach's alpha. The composite scale demonstrated a high alpha coefficient, indicating strong internal consistency and measurement reliability. A reliability coefficient above the recommended threshold suggests that the items consistently measure the intended construct and are suitable for further statistical analysis.

3.5.2 Content Validity

Content validity was established through an extensive review of existing service quality and transportation literature. Questionnaire items were designed to reflect key dimensions identified in prior research while ensuring relevance to the institutional context.

3.6 Data Collection Procedure

Data collection was conducted over a defined academic period using an online survey platform. Participation was voluntary, and respondents were informed about the purpose of the study and the confidentiality of their responses. To enhance response quality, the questionnaire was designed to be concise, user-friendly, and accessible across devices. Duplicate responses were restricted to maintain data integrity.

3.7 Ethical Considerations

The research was conducted in accordance with established ethical principles. Participation was voluntary, and respondents provided informed consent before completing the survey. No personally identifiable information was collected, thereby maintaining respondent anonymity. The data were used exclusively for academic research purposes and access was restricted to the researcher. The study adhered to general ethical guidelines for social science research involving human participants.

3.8 Statistical Tools and Techniques

The following statistical techniques were employed:

- Descriptive statistics to summarize demographic and perceptual data.
- Pearson correlation analysis was used to assess the relationship between the variables.
- Simple and multiple linear regression to assess predictive relationships.
- Chi-square tests to analyse associations between satisfaction and recommendation behaviour.
- Effect size measures to assess practical significance.

Statistical analysis was conducted using standard data analysis software to ensure accuracy and reproducibility.

4. Data Analysis and Results

This section presents the statistical analysis of transportation service quality, user satisfaction, and behavioural intention based on responses collected from 410 participants. The analysis incorporates descriptive statistics, correlation coefficients, regression models and chi-square testing to examine the proposed relationships.

4.1 Descriptive Statistics

The overall transportation service quality score recorded a mean value of 3.89 with a standard deviation of 0.62, indicating that respondents generally perceived the service as satisfactory. The moderate standard deviation suggests reasonable consistency in user perceptions. Overall satisfaction exhibited a mean score of 3.94 (SD = 0.71), reflecting a positive evaluation of the transportation service. Recommendation intention recorded a mean of 3.87 (SD = 0.76), indicating a favourable tendency toward service advocacy.

Interpretation:

The descriptive results reveal that transportation services are positively evaluated by users, with satisfaction levels slightly exceeding perceived service quality.

4.2 Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships between service quality, satisfaction, and recommendation intention. Transportation service quality demonstrated a strong positive correlation with overall satisfaction ($r = 0.768$, $p < 0.001$). This indicates that improvements in service quality are associated with substantial increases in satisfaction. Satisfaction exhibited a very strong correlation with recommendation intention ($r = 0.812$, $p < 0.001$), suggesting that satisfied users are significantly more likely to recommend the transportation service. Additionally, service quality showed a positive correlation with recommendation intention ($r = 0.701$, $p < 0.001$), reinforcing the indirect influence of service quality on behavioural outcomes.

Interpretation:
The correlation results strongly support the theoretical framework proposing satisfaction as a mediating variable between service quality and recommendation behaviour.

4.3 Regression Analysis

4.3.1 Service Quality as a Predictor of Satisfaction

Simple linear regression analysis was performed with service quality as the independent variable and satisfaction as the dependent variable. The model yielded an R value of 0.768 and an R^2 value of 0.590, indicating that 59.0% of the variance in satisfaction is explained by perceived transportation service quality. The regression model was statistically significant ($F = 586.42$, $p < 0.001$). The standardized beta coefficient ($\beta = 0.768$, $p < 0.001$) confirms that service quality is a strong predictor of satisfaction.

Interpretation:
In social science research, an R^2 value approaching 0.60 represents a substantial explanatory power, underscoring the central role of service quality in shaping satisfaction within institutional transportation systems.

4.3.2 Predictors of Recommendation Intention

Multiple regression analysis was conducted with service quality and satisfaction as predictors of recommendation intention. The model explained 66.1% of the variance in recommendation intention ($R^2 = 0.661$) and was statistically significant ($p < 0.001$). Satisfaction emerged as the strongest predictor ($\beta = 0.612$, $p < 0.001$), while service quality retained a significant but reduced direct effect ($\beta = 0.281$, $p < 0.01$).

Interpretation:
These findings empirically confirm the mediating role of satisfaction, demonstrating that service quality influences recommendation behaviour primarily through its impact on satisfaction.

4.4 Chi-Square Analysis

A chi-square test was employed to examine the association between satisfaction levels and recommendation intention. The results revealed a statistically significant association ($\chi^2 = 128.36$, $df = 16$, $p < 0.001$), indicating that higher satisfaction levels are strongly associated with increased likelihood of service recommendation.

Interpretation:
Even in institutional settings with limited choice alternatives, satisfaction significantly shapes positive advocacy behaviour.

4.5 Summary of Statistical Findings

- Transportation service quality scored a mean of 3.89, indicating positive user perceptions.
- Service quality strongly predicts satisfaction ($\beta = 0.768$, $R^2 = 0.590$).
- Satisfaction significantly influences recommendation intention ($\beta = 0.612$).
- A strong association exists between satisfaction and recommendation behaviour ($\chi^2 = 128.36$, $p < 0.001$).

5. Discussion of Findings

The purpose of this section is to interpret the empirical results in light of existing literature and theoretical expectations. Rather than restating numerical outcomes, the discussion explains why the observed relationships exist and how they contribute to understanding transportation service quality in higher educational institutions.

5.1 Transportation Service Quality and User Satisfaction

The analysis demonstrates that transportation service quality is a strong determinant of user satisfaction, explaining approximately 59% of the variance in satisfaction levels. This finding aligns with service quality theory, which posits that perceived service performance is a primary antecedent of satisfaction in recurring service encounters. The strength of this relationship suggests that users evaluate institutional transportation services not merely as logistical support but as an integral component of their academic experience. High beta values indicate that improvements in service reliability, safety and operational consistency directly enhance satisfaction. Consistent with prior studies in public and private transportation systems, the findings reinforce the argument that perceived quality outweighs objective metrics such as distance or duration in shaping satisfaction judgments. Even users with longer commute times reported higher satisfaction when service quality perceptions were favourable.

5.2 Role of Satisfaction as a Mediating Variable

One of the most significant contributions of this study is the empirical confirmation of satisfaction as a mediating mechanism between service quality and recommendation behaviour. While service quality exhibits a direct relationship with recommendation intention, the strength of this relationship diminishes when satisfaction is included in the regression model. This pattern indicates that users do not recommend services solely based on operational performance. Instead, recommendation behaviour emerges from a cumulative evaluative process in which satisfaction reflects emotional and cognitive assessments formed through repeated service use. The mediating role of satisfaction supports the Customer Satisfaction Model and extends its applicability to institutional service environments, where behavioural choices are constrained but attitudinal responses remain highly influential.

5.3 Satisfaction and Recommendation Intention

The strong association between satisfaction and recommendation intention highlights the importance of user experience in shaping institutional reputation. Even in settings where users cannot easily switch service providers, satisfaction influences how they communicate about the institution and its services. High satisfaction levels translate into positive word-of-mouth, informal advocacy and trust in institutional management. Conversely, dissatisfaction particularly when persistent can amplify negative perceptions and undermine institutional credibility among prospective users. The significant chi square association confirms that recommendation behaviour is not randomly distributed but systematically related to satisfaction levels, underscoring the strategic importance of maintaining consistent service quality.

5.4 Interpretation of Service Quality Dimensions

Although the study primarily focuses on composite service quality, descriptive findings indicate differential perceptions across individual dimensions. Core operational attributes such as route reliability and safety received stronger evaluations, while experiential aspects such as comfort and crowd management exhibited comparatively lower ratings. This imbalance suggests that institutions prioritize functional efficiency over user comfort, potentially underestimating the cumulative impact of experiential factors on satisfaction. Overcrowding and discomfort, even when not severe, can erode satisfaction over time, particularly among frequent users. The findings indicate that incremental improvements in comfort and communication may yield disproportionate gains in satisfaction relative to their implementation cost.

5.5 Alignment with Existing Literature

The findings of this study are consistent with prior research demonstrating strong links between service quality and satisfaction in transportation contexts. However, the magnitude of explanatory power observed in this study exceeds that reported in several public transportation studies, likely due to the repetitive and compulsory nature of institutional service usage. Unlike public transit users, institutional users interact with

the same service system daily, intensifying the impact of both positive and negative experiences. This repeated exposure amplifies the role of service quality in shaping satisfaction and behavioural intentions. By situating transportation services within an institutional framework, the study extends service quality research beyond commercial and public service models, highlighting the unique dynamics of organizational service environments.

5.6 Practical Implications of the Findings

The empirical results suggest that institutional transportation services should be managed as strategic assets rather than auxiliary functions. Investments in service quality yield tangible benefits in user satisfaction, operational efficiency, and institutional image. The dominance of service quality over demographic variables indicates that satisfaction is largely controllable through managerial intervention. This finding empowers administrators to proactively shape user perceptions through targeted improvements rather than attributing dissatisfaction to external constraints.

6. Managerial, Operational, and Policy Implications

The empirical findings of this study provide valuable insights for institutional administrators, transport managers, and policy planners responsible for designing and managing transportation services in higher educational environments. This section translates statistical evidence into actionable strategies aimed at improving service quality, user satisfaction and operational efficiency.

6.1 Managerial Implications

6.1.1 Service Quality as a Strategic Priority

The strong predictive relationship between service quality and satisfaction indicates that transportation services should be treated as strategic institutional functions rather than logistical support activities. Administrators must recognize that transportation performance directly influences user perceptions of institutional effectiveness. Managerial focus should shift from reactive problem-solving to proactive quality management. Regular monitoring of service quality indicators such as punctuality, safety compliance and comfort can help prevent dissatisfaction before it escalates into systemic issues.

6.1.2 User-Cantered Service Design

The findings underscore the importance of aligning transportation services with user expectations. While operational efficiency is essential, experiential factors such as comfort, cleanliness, and communication significantly shape satisfaction. Managers should adopt user-cantered design principles by incorporating periodic feedback mechanisms, including surveys and digital reporting tools. This approach enables continuous improvement and ensures that service modifications reflect actual user needs rather than administrative assumptions.

6.1.3 Performance Evaluation and Accountability

Given the measurable impact of service quality on satisfaction, institutions should integrate transportation service performance into broader operational evaluation frameworks. Establishing key performance indicators (KPIs) linked to punctuality, safety, and user satisfaction can enhance accountability among transport staff and contractors. Incentive structures aligned with service quality outcomes may further motivate adherence to performance standards and encourage innovation in service delivery.

6.2 Operational Implications

6.2.1 Capacity Planning and Crowd Management

Moderate dissatisfaction related to overcrowding highlights the need for improved capacity planning, particularly during peak hours. Operational strategies such as dynamic route scheduling, staggered departure times, and demand-based vehicle allocation can help mitigate crowding without substantial capital investment. The use of data analytics to predict peak demand patterns can further enhance route optimization and resource utilization.

6.2.2 Communication and Information Systems

The results indicate that communication gaps contribute to user dissatisfaction. Real-time information regarding delays, route changes or service disruptions can significantly improve user perceptions even when operational challenges arise. Implementing digital communication platforms such as mobile notifications or transport dashboards can enhance transparency and reduce uncertainty, thereby strengthening trust in transport management.

6.2.3 Maintenance and Safety Management

Although safety ratings were generally positive, maintaining high safety standards requires continuous vigilance. Preventive maintenance schedules, driver training programs, and safety audits should be institutionalized to sustain user confidence. Consistent attention to vehicle cleanliness and interior conditions can also yield substantial improvements in satisfaction with relatively low operational cost.

6.3 Policy Implications

At a policy level, the study highlights the need for formalized transportation service guidelines within higher educational institutions. Policies should define minimum service quality standards, safety protocols, and user grievance mechanisms. Institutional policies that recognize transportation as an essential service can facilitate adequate budget allocation, long-term planning, and integration with sustainability initiatives.

6.4 Sustainability and Future Transport Systems

6.4.1 Sustainable Transportation Practices

Transportation services present significant opportunities for sustainability enhancement. Transitioning to fuel-efficient or electric vehicles can reduce environmental impact while improving user perceptions of institutional responsibility. Sustainable transport initiatives also align with broader educational goals by modelling environmentally conscious behaviour for students and staff.

6.4.2 Technology-Driven Innovations

Emerging technologies offer new possibilities for improving transportation service quality. Artificial intelligence–based route optimization, predictive maintenance systems and smart scheduling tools can enhance operational efficiency and reliability. The integration of digital ticketing, attendance linkage and transport analytics platforms can further streamline service management and data-driven decision-making.

6.5 Strategic Integration with Institutional Goals

The findings suggest that transportation services should be integrated into institutional strategic planning frameworks. Aligning transport management with academic schedules, campus expansion plans and sustainability objectives can maximize the long-term benefits of service quality investments. By positioning transportation services as enablers of academic success and operational efficiency, institutions can strengthen their overall value proposition.

7. Conclusion, Limitations, and Future Research Directions

This section summarizes the key findings of the study, outlines its limitations, and identifies avenues for future research. It also highlights the academic and practical contributions of the research to the field of service quality and institutional transportation management.

7.1 Conclusion

This study examined the relationship between transportation service quality, user satisfaction, and behavioural intentions within a higher education context. By employing quantitative analytical techniques on data collected from 410 transportation service users, the research provides empirical evidence supporting the central role of service quality in shaping satisfaction and recommendation behaviour. The findings demonstrate that perceived transportation service quality significantly influences overall satisfaction, accounting for a substantial proportion of variance in satisfaction levels. Furthermore, satisfaction was identified as a key mediator between service quality and recommendation intention, confirming theoretical propositions derived from service management literature. The study reveals that users evaluate transportation services holistically, incorporating both functional attributes such as reliability and safety and experiential attributes such as comfort and communication. While core operational performance was generally rated positively, areas related to user experience present opportunities for improvement. Overall, the research underscores the importance of managing institutional transportation services strategically. High-quality transportation systems not only facilitate daily academic operations but also contribute to positive user perceptions, institutional reputation, and operational efficiency.

7.2 Academic Contributions

This research contributes to existing literature in several ways. First, it extends service quality theory to institutional transportation systems, a context that has received limited empirical attention. Second, the study empirically validates the mediating role of satisfaction in shaping behavioural intentions within a constrained choice service environment. Third, by employing robust statistical techniques, the research demonstrates the explanatory power of service quality perceptions in non-commercial service settings. The findings enrich understanding of how service quality operates in institutional contexts and provide a foundation for future theoretical and empirical exploration.

7.3 Practical Contributions

From a practical perspective, the study offers evidence-based insights for administrators and transport managers seeking to enhance service effectiveness. The results emphasize that improvements in service quality particularly in comfort, communication and crowd management can yield substantial gains in satisfaction and advocacy. By linking service performance directly to behavioural outcomes, the research supports data-driven decision-making and strategic investment in transportation services as critical institutional infrastructure.

7.4 Limitations of the Study

Despite its contributions, the study has certain limitations. First, the use of a cross-sectional research design restricts the ability to infer causal relationships over time. Second, the reliance on self-reported data may introduce response bias, as perceptions and satisfaction are inherently subjective. Additionally, the use of convenience sampling limits the generalizability of findings beyond the studied context. While the sample size was sufficient for statistical analysis, future studies may benefit from probability sampling techniques to enhance representativeness.

7.5 Directions for Future Research

Future research may build upon the present study in several ways:

1. Longitudinal studies could examine changes in satisfaction and service quality perceptions over time.

2. Comparative studies across multiple institutions could enhance generalizability and identify contextual differences.

3. Qualitative research methods could complement quantitative findings by exploring user experiences in greater depth.

4. Future models may incorporate additional variables such as stress levels, academic performance, or well-being outcomes.

5. The impact of emerging technologies and sustainable transport solutions on satisfaction warrants further investigation.

7.6 Final Remarks

Transportation services represent a vital yet often underappreciated component of institutional operations. This study demonstrates that service quality in transportation systems plays a decisive role in shaping user satisfaction and behavioural outcomes. By adopting a user-cantered, quality-driven approach to transport management, institutions can enhance operational efficiency, improve user experiences and strengthen their overall academic environment.

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