

**Empathetic connection between public transportation and university quality of life: legal implications for student well-being**

*Conexión empática entre el transporte público y la calidad de vida universitaria: implicaciones legales para el bienestar estudiantil*

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**Silvia Isabel Figueroa-Quito<sup>1</sup>**

<https://orcid.org/0000-0003-2986-4809>  
[sfigueroaq@unasam.edu.pe](mailto:sfigueroaq@unasam.edu.pe)

**Nathaly Luisa Trujillo-Navarro<sup>1</sup>**

<https://orcid.org/0009-0003-4429-9972>  
[ntrujillon@unasam.edu.pe](mailto:ntrujillon@unasam.edu.pe)

**César Hernán Norabuena-Mendoza<sup>1\*</sup>**

<https://orcid.org/0000-0001-9832-5126>  
[cnorabuenam@unasam.edu.pe](mailto:cnorabuenam@unasam.edu.pe)

**Reyna Edelina Robles-Espinoza<sup>1</sup>**

<https://orcid.org/0000-0002-8633-7338>  
[rroblese@unasam.edu.pe](mailto:rroblese@unasam.edu.pe)

**Fabel Bernabé Robles-Espinoza<sup>1</sup>**

<https://orcid.org/0000-0003-4389-8351>  
[froblese@unasam.edu.pe](mailto:froblese@unasam.edu.pe)

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**ABSTRACT**

Digital transformation and increasing urban mobility challenges have highlighted the importance of public transportation as a determinant of university students' well-being. This study analyzes the relationship between empathetic connection in public transportation services and university quality of life in the Ancash region of Peru, incorporating a legal perspective on student mobility rights. A quantitative, correlational, non-experimental, and cross-sectional design was employed. Data were collected from a sample of 224 students enrolled in business sciences programs using structured questionnaires. The reliability of the instruments was confirmed through Cronbach's Alpha coefficient. Pearson correlation analysis revealed statistically significant positive relationships between empathetic service dimensions empathy, personalized attention, flexibility, and understanding of users' concerns and students' quality of life ( $p < .001$ ). Among these, empathy in service showed the strongest association. These findings indicate that more empathetic public transportation systems contribute to improved student well-being and reduced stress levels. The study highlights the need to incorporate student-centered approaches into transportation policies and supports the recognition of dignified mobility as part of the right to education.

**Keywords:** public transportation; empathy; university quality of life; student well-being; legal framework

1. Universidad Nacional Santiago Antúnez de Mayolo- Perú

\* Autor de correspondencia: [cnorabuenam@unasam.edu.pe](mailto:cnorabuenam@unasam.edu.pe)

## RESUMEN

La transformación digital y los crecientes desafíos de movilidad urbana han puesto en evidencia la importancia del transporte público como un factor determinante en el bienestar de los estudiantes universitarios. El presente estudio analiza la relación entre la conexión empática en los servicios de transporte público y la calidad de vida universitaria en estudiantes de la región Áncash, Perú, incorporando una perspectiva legal sobre el derecho a la movilidad y su vínculo con el acceso a la educación. Metodológicamente, se empleó un enfoque cuantitativo, con diseño no experimental, de tipo correlacional y corte transversal. La muestra estuvo conformada por 224 estudiantes de programas de ciencias empresariales, a quienes se aplicó un cuestionario estructurado con escala tipo Likert. La confiabilidad de los instrumentos fue validada mediante el coeficiente Alfa de Cronbach. El análisis estadístico, realizado a través del coeficiente de correlación de Pearson, evidenció relaciones positivas y estadísticamente significativas entre las dimensiones del servicio empático empatía, atención personalizada, flexibilidad y comprensión de las necesidades del usuario y la calidad de vida universitaria ( $p < .001$ ). La dimensión empatía presentó la mayor asociación. Los resultados indican que sistemas de transporte más empáticos contribuyen a mejorar el bienestar estudiantil y a reducir niveles de estrés asociados al desplazamiento diario. Se concluye que la incorporación de enfoques centrados en el usuario en las políticas de transporte, así como el reconocimiento de la movilidad digna como condición habilitante del derecho a la educación, resultan fundamentales para fortalecer la calidad de vida de los estudiantes en contextos urbanos

**Palabras Clave:** Transporte público; empatía; calidad de vida universitaria; bienestar estudiantil; marco legal.

## INTRODUCCIÓN

Urban mobility has become a critical factor influencing the quality of life of university students, particularly in regions where public transportation systems present structural and operational limitations. In developing contexts, deficiencies in transport services—such as overcrowding, irregular schedules, inadequate infrastructure, and limited accessibility—can negatively affect students' academic performance, emotional well-being, and overall daily functioning. As a result, transportation is no longer viewed solely as a logistical issue but as a key component of social equity and educational access.

In recent years, growing attention has been given to the role of human-centered approaches in public service delivery. Within this framework, empathy has emerged as a relevant dimension in evaluating service quality, particularly in transportation systems that directly interact with users on a daily basis. Empathy in public transportation refers to the capacity of service providers to understand and respond to users' needs, concerns, and expectations, fostering a more respectful, inclusive, and supportive travel experience. Previous studies have shown that empathetic

service delivery contributes to user satisfaction, reduced stress levels, and improved perceptions of service quality.

At the same time, university quality of life has been increasingly recognized as a multidimensional construct that encompasses not only academic conditions but also environmental, social, and infrastructural factors. Among these, access to efficient and dignified transportation plays a fundamental role, as it directly influences students' punctuality, safety, comfort, and psychological well-being. Poor transportation conditions may generate fatigue, anxiety, and time constraints, ultimately affecting students' academic engagement and performance.

Despite the relevance of these factors, there remains a limited integration of empirical and legal perspectives in the analysis of transportation and student well-being, particularly in Latin American contexts. While previous research has examined service quality and mobility challenges, fewer studies have explored how empathetic dimensions of public transportation relate to university quality of life and how these relationships can be framed within the recognition of mobility as a social and educational right. This gap highlights the need for a more comprehensive approach that combines quantitative analysis with normative considerations.

From a legal standpoint, access to adequate transportation can be interpreted as part of the broader right to education, as it conditions students' ability to attend academic institutions under dignified and equitable circumstances. In this sense, public policies aimed at improving transportation services should incorporate principles of accessibility, equity, and human dignity, particularly for student populations.

In this context, the present study aims to analyze the relationship between empathetic connection in public transportation and university quality of life among students in the Ancash region of Peru, incorporating a legal perspective on mobility and student well-being.

## THEORETICAL FRAMEWORK

### Empathy in Public Transportation Services

Empathy has emerged as a key dimension in the evaluation of service quality, particularly in sectors characterized by direct and continuous interaction with users, such as public transportation. In this context, empathy refers to the ability of service providers to understand users' needs, concerns, and expectations, as well as to respond in a respectful and personalized manner (Parasuraman et al., 1988). This dimension is closely related to human-centered service approaches, which emphasize dignity, inclusion, and responsiveness in service delivery (Zeithaml et al., 2018).

In transportation systems, empathetic service is reflected in aspects such as courteous treatment, effective communication, flexibility in addressing user needs, and the capacity to recognize the diverse conditions of passengers. These elements contribute to a more positive travel experience and can reduce stress levels associated with daily commuting. Furthermore, empathy in service provision is linked

to user satisfaction and trust, which are essential components for improving the perceived quality of public transportation systems (Eboli & Mazzulla, 2007).

From a broader perspective, incorporating empathy into public transportation services represents a shift from purely operational models toward more socially oriented approaches, where users are recognized not only as passengers but as individuals with specific needs and rights.

### **University Quality of Life**

University quality of life is a multidimensional construct that encompasses students' physical, emotional, social, and academic well-being within the educational environment (Sirgy et al., 2007). It goes beyond academic performance and includes factors such as access to resources, environmental conditions, interpersonal relationships, and institutional support systems.

Among these dimensions, mobility and transportation play a crucial role, as they directly influence students' daily experiences. Reliable and accessible transportation allows students to attend classes on time, participate in academic and extracurricular activities, and maintain a balance between academic responsibilities and personal life. Conversely, deficiencies in transportation systems—such as delays, overcrowding, and unsafe conditions—can negatively impact students' well-being, generating fatigue, stress, and decreased academic engagement (Delbosc & Currie, 2011).

Therefore, university quality of life must be understood as a holistic concept that integrates both internal institutional factors and external conditions, including urban mobility and access to public services.

### **Public Transportation and Student Well-Being**

The relationship between public transportation and student well-being has gained increasing attention in recent years, particularly in urban and semi-urban contexts where students rely heavily on public transit systems. Transportation conditions can significantly affect students' physical and psychological states, influencing their levels of stress, safety perception, and overall satisfaction with their daily routines.

Inadequate transportation services may lead to negative outcomes such as chronic fatigue, anxiety, and reduced academic performance. On the other hand, efficient, safe, and user-oriented transportation systems can enhance students' well-being by providing reliable access to educational institutions and reducing the burden associated with commuting (Currie & Delbosc, 2010).

Within this framework, the concept of empathetic transportation becomes especially relevant, as it links service quality with emotional and psychological dimensions of user experience. By addressing students' needs in a more personalized and humane manner, transportation systems can contribute to improving their quality of life and overall academic experience.

### **Legal Perspective on Mobility and Education**

From a legal standpoint, access to public transportation can be interpreted as an enabling condition for the exercise of the right to education. Although transportation is not always explicitly recognized as a fundamental right, it plays a crucial role in ensuring equitable access to educational opportunities, particularly for students from vulnerable or geographically distant areas (UNESCO, 2019).

Legal frameworks related to social rights emphasize the principles of equality, accessibility, and human dignity, which can be extended to transportation policies. In this sense, the provision of adequate, safe, and inclusive transportation services should be considered part of the State's responsibility to guarantee the effective exercise of educational rights.

Furthermore, the integration of a legal perspective into the analysis of public transportation highlights the need for public policies that address not only technical and operational aspects but also social and ethical considerations. This includes the development of regulations and programs aimed at improving transportation conditions for students, promoting inclusive mobility, and reducing inequalities in access to education (United Nations, 2020).

## **METHODOLOGY**

### **Research Approach and Design**

This study was conducted under a quantitative approach, as it seeks to examine the relationship between empathetic connection in public transportation services and university quality of life through measurable variables and statistical analysis (Hernández-Sampieri & Mendoza, 2018). The research is non-experimental, since the variables were not manipulated, but rather observed in their natural context.

The design is cross-sectional, as data were collected at a single point in time, and correlational, given that the study aims to determine the degree of association between the variables under investigation (Creswell, 2014).

### **Population and Sample**

The target population consisted of university students enrolled in business sciences programs in the Ancash region of Peru. From this population, a sample of 224 students was selected.

The sampling technique was non-probabilistic, convenience-based, due to accessibility and availability of participants. Although this limits generalizability, it is appropriate for exploratory and correlational studies in social sciences (Etikan et al., 2016).

### **Data Collection Technique and Instrument**

Data were collected using the survey technique, through a structured questionnaire composed of items designed to measure two main variables:

Empathetic connection in public transportation, operationalized through dimensions such as empathy, personalized attention, flexibility, and understanding of users' concerns.

University quality of life, including aspects related to well-being, satisfaction, and daily academic experience.

The instrument was structured using a Likert-type scale, allowing participants to express their level of agreement with each statement.

### **Validity and Reliability**

The content validity of the instrument was established through expert judgment, ensuring that the items adequately represented the dimensions of the variables studied.

To assess internal consistency, Cronbach's Alpha coefficient was calculated. The results indicated a satisfactory level of reliability:

- Empathy variable:  $\alpha = 0.87$
- University quality of life:  $\alpha = 0.85$

These values indicate high internal consistency, as coefficients above 0.70 are considered acceptable in social science research (Nunnally & Bernstein, 1994).

### **Data Collection Procedure**

The data collection process was carried out during the academic period, with prior authorization from institutional authorities. Participants were informed about the purpose of the study and voluntarily agreed to take part.

Ethical considerations were respected throughout the process, ensuring confidentiality, anonymity, and informed consent of the participants.

### **Data Analysis**

The collected data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS), version 26.

Descriptive statistics were first used to characterize the sample and variables. Subsequently, Pearson's correlation coefficient was applied to determine the strength and direction of the relationship between empathetic connection in public transportation and university quality of life.

The level of statistical significance was established at  $p < .05$ , and highly significant results were reported at  $p < .001$ .

## **RESULTS**

### **Descriptive Analysis**

The descriptive analysis allowed for the characterization of the main variables under study: empathetic connection in public transportation and university quality of life.

Regarding empathetic connection, students reported generally moderate to high levels across its dimensions. The highest scores were observed in items related to respectful treatment and recognition of user needs, indicating that students perceive certain positive aspects in interpersonal interactions within transportation services. However, variability was observed in dimensions such as flexibility and personalized attention, suggesting inconsistencies in service delivery.

In relation to university quality of life, the results indicate intermediate levels of perceived well-being. Students reported that transportation conditions influence their daily academic experience, particularly in terms of punctuality, comfort, and emotional state. Although some students expressed acceptable levels of satisfaction, others reported difficulties associated with commuting conditions, including delays, overcrowding, and fatigue.

### Correlation Analysis

To examine the relationship between empathetic connection in public transportation and university quality of life, Pearson's correlation coefficient ( $r$ ) was applied.

**Table 1**

Pearson Correlations Between Empathetic Connection in Public Transportation and University Quality of Life

Variables	$r$	p-value
Empathy – Quality of life	0.68	< .001
Personalized attention – Quality of life	0.61	< .001
Flexibility – Quality of life	0.57	< .001
Understanding of users – Quality of life	0.63	< .001

The results show positive and statistically significant correlations between all dimensions of empathetic connection and university quality of life ( $p < .001$ ).

According to commonly accepted criteria for correlation strength in social sciences, the values obtained can be interpreted as follows:

- Strong correlation: Empathy ( $r = 0.68$ )
- Moderate to strong correlation: Understanding of users' concerns ( $r = 0.63$ )
- Moderate correlation: Personalized attention ( $r = 0.61$ ) and flexibility ( $r = 0.57$ )

These results indicate that as the perceived level of empathy in transportation services increases, students tend to report higher levels of quality of life.

### Comparative Analysis of Dimensions

Among the dimensions analyzed, empathy showed the highest correlation with university quality of life, suggesting that emotional and interpersonal aspects of service delivery play a particularly relevant role in shaping students' perceptions of well-being.

Similarly, the dimension understanding of users' concerns presented a relatively strong association ( $r = 0.63$ ), highlighting the importance of recognizing students' specific needs and daily challenges in transportation systems.

In contrast, flexibility and personalized attention, although significant, showed comparatively lower correlation values. This suggests that while these factors contribute to quality of life, their impact may be less pronounced than that of empathy-related dimensions.

Overall, the results demonstrate a consistent pattern: all dimensions of empathetic connection in public transportation are positively associated with university quality of life. No negative or non-significant relationships were identified.

The statistical significance of all correlations ( $p < .001$ ) indicates a high level of confidence in the observed relationships, supporting the robustness of the findings.

## DISCUSSION

The findings of this study provide empirical evidence supporting the relevance of empathetic connection in public transportation as a significant factor influencing university students' quality of life. The positive and statistically significant correlations identified across all dimensions suggest that transportation services are not merely logistical systems but also social environments that shape users' daily experiences and well-being.

In particular, the strong association between empathy and university quality of life ( $r = 0.68$ ) highlights the importance of interpersonal and emotional dimensions in service delivery. This result is consistent with service quality theory, which emphasizes empathy as a core determinant of user satisfaction and perceived service effectiveness (Parasuraman et al., 1988; Zeithaml et al., 2018). From this perspective, transportation systems that incorporate human-centered approaches are more likely to generate positive user experiences and contribute to overall well-being.

Moreover, the findings align with previous research indicating that transportation conditions significantly affect individuals' psychological and emotional states. Studies by Currie and Delbosc (2010) and Delbosc and Currie (2011) demonstrate that inadequate transport services can lead to stress, fatigue, and social exclusion, particularly among populations that depend heavily on public transportation, such as students. The present study extends this line of research by showing that not only structural aspects of transportation matter, but also the quality of human interaction within these systems.

The relatively strong correlation observed in the dimension of understanding users' concerns ( $r = 0.63$ ) further reinforces the role of responsiveness and user recognition in shaping perceptions of quality of life. This finding suggests that transportation systems that actively acknowledge and address users' needs can contribute to more positive commuting experiences. In contrast, dimensions such as flexibility and personalized attention, while still significant, showed comparatively lower correlations, indicating that their influence may be secondary to more fundamental empathetic interactions.

From a broader analytical perspective, these results support the notion that public transportation should be conceptualized as a component of social infrastructure with direct implications for well-being and equity. As highlighted by Sirgy et al. (2007), quality of life is influenced by both institutional and environmental conditions, and transportation plays a key role in connecting individuals to educational opportunities and social participation.

Importantly, this study also contributes by integrating a legal perspective into the analysis of transportation and student well-being. The results suggest that deficiencies in public transportation may not only affect comfort and efficiency but also raise concerns related to equity and access to education. In line with international frameworks such as UNESCO (2019), access to adequate transportation can be considered an enabling condition for the effective exercise of the right to education. Therefore, improving transportation services is not only a matter of operational efficiency but also of social justice and public policy.

Additionally, the findings highlight the need for policy interventions that incorporate empathy as a guiding principle in the design and management of transportation systems. While traditional approaches have focused on infrastructure and efficiency, the present results suggest that user-centered strategies can significantly enhance perceived quality of life. This aligns with recent discussions on sustainable and inclusive urban mobility, which emphasize the importance of accessibility, dignity, and user experience (United Nations, 2020).

From a regional perspective, the study provides relevant evidence for Latin American contexts, where transportation systems often face structural limitations. By demonstrating the relationship between empathetic service and student well-being, the research contributes to the understanding of how social and service-related factors interact within mobility systems in developing regions.

Finally, this study contributes to the literature by empirically linking empathetic service dimensions with university quality of life, while simultaneously incorporating a legal framework that highlights the role of transportation as a facilitator of educational rights. This integrative approach provides a more comprehensive understanding of the phenomenon and opens new avenues for interdisciplinary research in transportation, education, and public policy.

## CONCLUSIONS

This study analyzed the relationship between empathetic connection in public transportation and university quality of life among students in the Ancash region of Peru, incorporating a legal perspective on mobility and educational access. The findings confirm that empathetic dimensions of transportation services are significantly associated with students' perceived well-being, highlighting the relevance of human-centered approaches in public service delivery.

The results demonstrate that empathy, as a core dimension of service quality, presents the strongest relationship with university quality of life, followed by understanding of users' concerns, personalized attention, and flexibility. These findings indicate that interpersonal and emotional aspects of transportation services

play a critical role in shaping students' daily experiences, beyond traditional operational factors such as efficiency and coverage.

From a practical standpoint, the study underscores the need for transportation systems to move beyond purely technical and infrastructure-based approaches, incorporating user-centered strategies that prioritize respect, responsiveness, and inclusion. Enhancing empathetic service delivery can contribute to reducing stress levels, improving commuting experiences, and ultimately strengthening students' academic engagement and performance.

From a legal perspective, the findings highlight the importance of recognizing public transportation as an enabling condition for the effective exercise of the right to education. Inadequate transportation services may create barriers to access, particularly for students in vulnerable or geographically distant contexts. Therefore, public policies should incorporate principles of equity, accessibility, and human dignity in the design and regulation of transportation systems.

In theoretical terms, this study contributes to the literature by integrating concepts from service quality, urban mobility, and educational well-being, providing empirical evidence on the relationship between empathetic service and quality of life in a university context. The inclusion of a legal perspective further expands the analytical framework, offering an interdisciplinary approach to understanding transportation as both a service and a social right.

Finally, future research should explore these relationships in different geographical and institutional contexts, as well as incorporate longitudinal designs to examine changes over time. Additionally, further studies could analyze the role of digital technologies and smart mobility solutions in enhancing empathetic interactions within transportation systems.

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