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## Article

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# University public transportation logistics service quality and student satisfaction: empirical evidence from Thailand

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## ABSTRACT

Although students around campuses mostly rely on university public transportation (i.e. shuttle buses), studies on how university public transportation logistics service quality impacts student satisfaction are limited. Hence, this study investigates the university public transportation logistics service quality attributes that affect student satisfaction. Data obtained from 202 valid questionnaires completed by students who frequently use shuttle services were analyzed using partial least square structural equation modeling with the assistance of the statistical package for social sciences V. 27 and smart partial least squares 4.0. The results show that the university public transportation logistics service quality attributes of empathy, reliability, and timeliness significantly influenced student satisfaction. Specifically, reliability is most important when it comes to university public transportation logistics service quality, considering that transportation services should be safe and efficient. This suggests that the university public transportation logistics service quality is important for student satisfaction and should not be ignored. To the best of our knowledge, this is the first attempt at understanding the effects of university public transportation logistics service quality attributes on student satisfaction with university public transportation in Thailand.

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## 1. Introduction

The quality of logistics services is vital in determining customer satisfaction and indicating a company's position in a competitive market (Lisińska-Kuśnier & Gajewska, 2014). The main task of a logistics company is to plan distribution routes, connect areas to one another (Uvet, 2020), and measure shipping efficiency. Different types of courier service providers can arrange transportation through different modes of travel, such as land, sea, and air. Travel is essential for facilitating the transport of goods or people between destinations (Ho et al., 2012a). By providing transportation services, logistics companies can become key players in the safe delivery of goods to customers. A high level of competition necessitates that companies understand how to use their resources, thus enabling them to place efficiency at the heart of the service, win against competition, and enhance customer satisfaction (Berry et al., 1994).

Moreover, logistics service quality can indicate the efficiency of a company's entire work process in delivering goods and providing information to the customer. This is because the quality of logistics services depends on customers' utilization of time and space. How these logistics service processes affect customers depends on how they benefit from the service purchased (Gil Saura et al., 2008). Indeed, a company must ensure that its logistics service can provide customer satisfaction and monitor, supervise, and improve service quality (Kilibarda et al., 2012). The concept of logistics service quality (LSQ) is compound, dispersed, intangible, and principally appropriate to customers' demands and experiences, as well as the specific area of the service. From the consumer perspective, it is often associated with customer satisfaction (Kadlubek & Grabara, 2015).

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Khon Kaen University (KKU) comprises 27,689 students and is spread over a large area of 8,800,000 square meters, owing to students' need to travel to perform many activities on campus daily, causing traffic problems, especially during the morning and evening rush hours. Consequently, KKU introduced public transportation (e.g. KKU shuttle buses), ferrying personnel and students within the university, free of charge, to reduce the use of personal cars, thereby alleviating traffic congestion, accidents, and pollution within the university (Chatathicoon & Tanwanichkul, 2021). To assess student or customer satisfaction, students' experiences must be measured against their expectations. Although subjective, the feeling of using the services offered is considered to be an effective and reliable basis of assessment, as well as one that ensures an accurate picture of the perceived service (Lisińska-Kuśnierz & Gajewska, 2014).

Previous studies have discussed different attributes related to public transportation logistics service quality. de Oña (2022) noted that the relationships between punctuality, frequency, information, and intermodality are among the five most important service quality attributes (Madrid and Lisbon). Balouei Jamkhaneh et al. (2022) focused on the impact of Logistics 4.0 (logistics technologies) on service quality attributes. Gupta et al. (2023) added that 'operational quality,' 'resource quality,' 'information quality,' 'personnel contact quality,' and 'customization and innovation quality' are directly related to user satisfaction.

However, there is little research on how students view the university public transportation logistics service quality (UPT-LSQ) in universities and how these companies operating in universities resolve or develop a solution for receiving feedback from students using the service. Hence, we intend to determine how students view or express their experience of the campus UPT-LSQ called the 'Shuttle Bus,' as these services greatly affect students' daily lives. Hence, this study aims to investigate the attributes of shuttle buses (UPT-LSQ) that affect student satisfaction. Specifically, this study aimed to answer the following question: From a student's standpoint, which factors impact UPT-LSQ?

To answer the aforementioned questions, questionnaires were distributed to students who frequently use campus shuttle buses. Data were analyzed by partial least square structural equation modeling (PLS-SEM) with the assistance of the statistical package for social sciences V. 27 (SPSS 27) and smart partial least squares 4.0 (Smart-PLS 4.0). Through structural equation modeling (SEM), we found that three factors (empathy, reliability, and timeliness) significantly impact student satisfaction with the UTP-LSQ. We hope the present results will help university administrators improve their UTP-LSQ scores.

## 2. Literature review

Logistics service quality (LSQ) is an instrument used to determine how effectively a service provider adds value to customers by increasing customer satisfaction and loyalty (Huma et al., 2019). Kadłubek and Jereb (2015) further added that logistic customer service is 'the abilities or skills to meet the customer's requirements and expectations, chiefly in terms of the time and place of deliveries, while using all available forms of logistic activity, including transport, storage, and the management of inventories, information and packages' p. 08. Logistics services can enhance customer relationships (Huma et al., 2019). Owing to the various changes in market behavior regarding service quality variables, LSQ has become one of the most significant determinants of customer satisfaction (Ho et al., 2012a). Numerous types of transportation constantly change their regulations to provide the highest possible level of service quality (Boquet, 2013). According to Goldbach et al. (2022), qualitative psychological factors, travel time, and costs significantly affect a logistics service's ability to deliver high-quality public transportation services.

### 2.1. Overview of Khon Kaen university

KKU is a large university with an area of 5,500 rai or 8,800,000 square meters, necessitating travel between different locations on campus for various school activities. In 2018, the university had 11,106

staff members, 27,687 graduate and postgraduate students, and 3,632 primary and secondary students. Some students do not have motorcycles or private cars and rely on public transportation (i.e. shuttle buses) to travel to different institutions or departments and study (Chatathicoon & Tanwanichkul, 2021).

Recently, traffic congestion has become a cause of concern when traveling on campus owing to the large number of students. Surprisingly, some students are unwilling to use public transportation. Hence, this study attempts to understand the factors that impact student satisfaction and motivate students to use university shuttle buses. Additionally, the UPT-LSQ factors of shuttle buses, which affect student satisfaction at KKU, should be considered. We hope that our findings will offer better ideas for improving the efficiency of shuttle bus services.

## 2.2. Empathy

Empathy is the caring and individualized attention that a firm provides to its customers (Gulc, 2017). Empathy is related to the quality of personal communication and information provided to customers by the firm (Saura et al., 2008). Furthermore, empathy is not related to other factors, meaning that customer sentiment is not included in service evaluations (Franceschini & Rafele, 2000). Thus, customer service can be differentiated from empathy because how empathy affects the evaluation of LSQ is unknown; however, it certainly affects customer satisfaction. A recent study also confirmed that empathy positively impacts student satisfaction within sports education programs (Saori et al., 2023). Hence, we hypothesize the following:

H<sub>1</sub> Empathy positively impacts student satisfaction.

## 2.3. Perceived value

Although many previous studies have highlighted different factors in the perception of service value, customer values, and attitudes, they essentially mean the same. Recognized value is the collective processing of customers who benefit from a product or service based on a comparison between costs and gains in terms of time, money, effort, and benefits to the company. Passengers not only consider the satisfaction or dissatisfaction they experience but also the value of the quality of service they receive (Thongkruer & Wanarat, 2021). From a quality perspective, value is the difference between the money paid for a product and its quality. This means that when we pay less for a high-quality product, its perceived value is higher (Kuo et al., 2009). Hence, perceived value refers to the total utility that consumers receive from consuming a product or service at the price they pay. In terms of LSQ, students can use the shuttle bus service for free without paying, resulting in increased student satisfaction. Therefore, we hypothesize the following:

H<sub>2</sub> Perceived value positively impacts student satisfaction.

## 2.4. Reliability

Service reliability refers to an individual's ability to serve quickly. Thus, it is considered reliable and safe (Restuputri et al., 2021). Reliability also influences the logistics company's commitment to care. Service reliability combines modern technology with high efficiency and can be effectively used by logistics companies to provide LSQ. This allows these companies to better assess the quality of their logistics services and manage their future expenditures, making management more efficient in improving service quality (Berry et al., 1994). Therefore, reliability is an important factor for customers. A reliable LSQ positively affects customer satisfaction. Recently, Abu-Rumman and Qawasmeh (2022) noted a positive relationship between reliability and student satisfaction. Thus, we hypothesize the following:

H<sub>3</sub> Reliability positively impacts student satisfaction.

## 2.5. Timeliness

Timeliness refers to providing on schedule, whether delivering an order or conducting an activity for a service user (Huma et al., 2019). Timeliness is essential for reducing the downtime in service processes. In addition, customer satisfaction can be enhanced through flexible hours based on customer requirements (Ho et al., 2012b). Moreover, emphasis on the importance of punctuality is also a key evaluator of order fulfillment quality and significantly impacts customer satisfaction in online shopping and logistics (Murfield et al., 2017). Customers are particularly concerned about timeliness because they must work and partake in daily activities. Moreover, it can affect the timeliness of transportation service workflows. A recent study by Saputri and Mulyani (2022) confirmed the significant influence of speed, timeliness, and ease of access on students' satisfaction in implementing academic information systems. Hence, we hypothesize the following:

H<sub>4</sub> Timeliness positively impacts student satisfaction.

## 2.6. Satisfaction

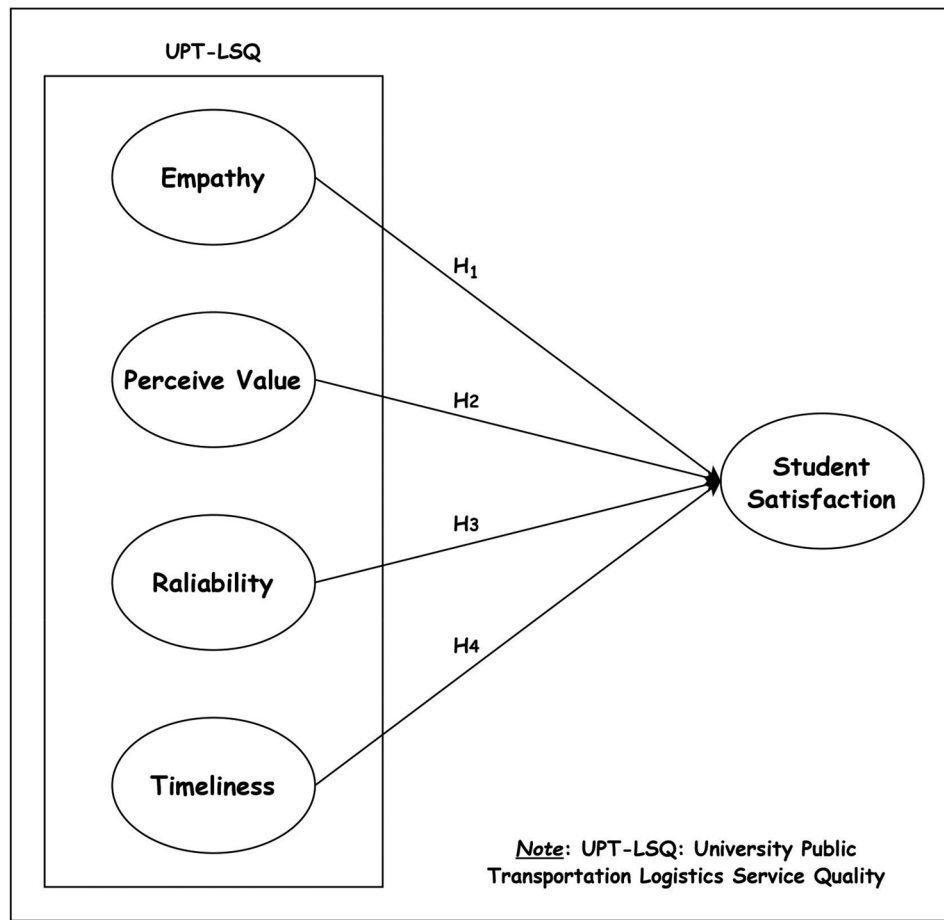
Satisfaction is a business term that describes the evaluation of a product or service provided by a company, ensuring that customers obtain what they hope for (Roslan et al., 2015). Dissonance is a feeling of remorse over the purchase of a product/service, especially if the results do not meet expectations and customers regret their decision to buy or use the product or service. Satisfaction can be easily identified through surveys, satisfaction scores, complaints, and repeat purchases, enabling the company to determine whether the customer is happy or biased and disappointed by the results, considering what was obtained, including purchasing decisions and demands related to the product (Huma et al., 2019). Therefore, satisfaction is the main factor in evaluating the LSQ (Lisińska-Kuśnierz & Gajewska, 2014). The greater the difficulty in assessing service quality, the greater the difficulty in measuring satisfaction. Customer satisfaction is a measure of service efficiency. Thus, if customers continue to use the service, it indicates that they have received the desired service, which has met their expectations. Figure 1 illustrates the conceptual framework of this study.

## 3. Research methodology

### 3.1. Data collection and questionnaire

The sample comprised KKU students who used a university shuttle bus at least once a month. An online survey was posted on the official Facebook page of KKU since Thai students spend most of their free time on social media platforms. A 5-point Likert rating scale was adopted, ranging from 1 (very disappointed) to 5 (very satisfied) (Joshi et al., 2015). The variables determining service user satisfaction include reusability, dependability, cleanliness, bus modernization, comfort during service, uptime, value, spending, bus stops, and routes (Chatathicoon & Tanwanichkul, 2021). Data were collected from September 1, 2022, to September 30, 2022, using the snowball sampling technique. Each question indicated the quality of the shuttle bus service.

Before conducting the survey, a pilot test was conducted with approximately 30 respondents. Additionally, to ensure the validity of the questionnaires, peers, and coworkers were interviewed to ensure that the questions were accurate, simple, and clear for everyone to understand. Following the suggestions and recommendations, the questionnaire was revised and improved before its final implementation. Cronbach's alpha was calculated to ensure questionnaire reliability. All variables obtained a Cronbach's alpha value higher than 0.6, which is considered acceptable (Bujang et al., 2018), except for the perceived value because of the non-readability of the question. Subsequently, the authors revised the questions based on the respondents' suggestions that the questions should be simpler, more readable, and easier to understand. The final dataset was collected. After the first 50 samples, we retested the reliability using Cronbach's alpha, and the values of all variables were higher than 0.6, confirming the reliability of the questionnaire.



**Figure 1.** Research framework.

Note. UPT-LSQ: university public transportation logistics service quality.

The samples were included in the final dataset. To select respondents who had experience with university shuttle buses, the first part of the questionnaire included questions about shuttle bus experience. Those whose replies included 'No' were excluded from the study. Additionally, the reverse-item technique was implemented to prevent respondents from answering carelessly (i.e. perceived value 2 [PV2]).

Finally, university students who had experience with university public transportation were selected as the study sample size as Li et al. (2022) stated that a university student sample is suitable for investigating the relationship between university service quality and student satisfaction. Therefore, it was appropriate for our study. After the initial screening of the erroneous samples, 48 samples were excluded. The final data comprised the responses from 202 experienced shuttle bus users. The final questionnaire was divided into three parts. The first was to gather general information and user experience, the second was a survey of students' satisfaction with the shuttle bus service, and the third was recommendations or suggestions (optional). Data is available for free online at Doi: [10.17632/4ryppc5jbr.1](https://doi.org/10.17632/4ryppc5jbr.1).

### 3.2. Measurement

Five variables, each measured at the same level, were used in this study. Each variable represents an essential factor in determining student satisfaction with the shuttle bus services and service history. The four questions on empathy were adapted from Akdere et al. (2020), Dewi et al. (2011), and Kilibarda et al. (2016). Another four questions regarding perceived value were adapted from Le et al. (2020). Five questions indicating reliability were used as satisfaction evaluation criteria (Chatathicon & Tanwanichkul, 2021; Kilibarda et al., 2016). The three questions indicating timeliness were adapted from Bouzaabia et al. (2013) and Uvet (2020). Finally, seven questions indicating satisfaction were adopted and modified from the



**Table 1.** Details of variables and their indicators.

Variables	Indicators	Source
Empathy		(Akdere et al., 2020; Dewi et al., 2011; Kilibarda et al., 2012)
EMP1	You feel safe when you use the shuttle bus.	
EMP2	The shuttle bus service is attentive to customers at all times.	
EMP3	The air conditioning on the shuttle bus makes you feel relaxed.	
EMP4	The shuttle bus is large, so those using the service will not feel uncomfortable.	
Perceived value		(Chatathicoon & Tanwanichkul, 2021; Le et al., 2020)
PV1	You feel satisfied when you can use the shuttle bus for free.	
PV2	You are amenable if the shuttle bus starts collecting money for the service.	
PV3	Using a shuttle bus can help reduce your daily travel expenses.	
PV4	Using a shuttle bus can greatly reduce air pollution.	
Reliability		(Chatathicoon & Tanwanichkul, 2021; Franceschini & Rafele, 2000)
RL1	When a problem arises in using the shuttle bus service, the transport company demonstrates its commitment to resolving the issue.	
RL2	The shuttle bus driver has good driving ability.	
RL3	The shuttle bus service is stable and reliable.	
RL4	The exterior of the shuttle bus is strong and compact.	
RL5	The shuttle service application will notify you of lost or incidental items during the service.	
Timeliness		(Bouzaabia et al., 2013; Uvet, 2020)
TL1	The shuttle bus service time is appropriate.	
TL2	The waiting time for each shuttle bus doesn't take long.	
TL3	You are satisfied with the frequency of the shuttle bus service.	
Student satisfaction		(Fernandes et al., 2018; Gil Saura et al., 2008; Sorkun et al., 2020)
SS1	You are satisfied with the shuttle bus service quality.	
SS2	You are satisfied with the cleanliness of the shuttle bus.	
SS3	The shuttle bus service is very convenient for you.	
SS4	The interior elements of the shuttle bus are appropriate (seat position or seat cushion).	
SS5	The technology in the shuttle bus is modern and looks high-quality.	
SS6	The bus stop displays the location of the shuttle bus at that time.	
SS7	We can see an application on the map that shows the location of every shuttle bus.	

Note: EMP, Empathy; PV, Perceived value; RL, Reliability; TL, Timeliness; SS, Student satisfaction.

studies of Fernandes et al. (2018), Gil Saura et al. (2008), and Sorkun et al. (2020). A structured response method using a 5-point Likert scale was used to increase the success rate. Cronbach's alpha was used for each export factor to ensure internal consistency. Table 1 details the variables and their indicators.

### 3.3. Data analysis

Data were analyzed using IBM SPSS 27 for organizing, cleaning, frequent analysis, and descriptive statistics, whereas SEM was conducted using Smart PLS 4.0. This study adopts PLS-SEM over covariance-based SEM because it is widely applied in social science research (Sann et al., 2023; Sann & Lai, 2023). Secondly, it is convenient for small sample issues where other applications are limited (Sann et al., 2023). Finally, PLS-SEM is free of a normal distribution. Accordingly, there is no need for a normal distribution of empirical data (Sann et al., 2023; 2023). Thus, PLS-SEM was suitable for this study.

### 3.4. Ethical consideration

This study was exempt from ethical considerations because it only included interactions involving educational tests (e.g. cognitive, diagnostic, aptitude, and achievement), survey procedures, interview procedures, or observation of public behavior.

## 4. Results

### 4.1. Descriptive statistics

Questionnaires were distributed to students using the shuttle bus service. After the completion of the study, 202 valid samples were included. Table 2 summarizes respondents' demographic and general information, according to which females constituted the majority at 64.9%, followed by males at 30.2%. Regarding age and education, the majority were in their 20s (36.1%) and studying for a bachelor's degree (94.1%), respectively. Additionally, most of them earn less than 10,000 baht (65.8%).



**Table 2.** Demographic information.

Items	Describe	Frequency	Percent (%)
Gender	Female	131	64.9
	LGBTQ	1	0.5
	Male	61	30.2
	Prefer not to say	9	4.5
Age	19 or below	52	25.7
	20	73	36.1
	21	36	17.8
	22	27	13.4
	23 or more	14	6.9
Degree	Currently studying for a bachelor's degree	190	94.1
	Currently studying for a master's degree	8	4.0
	Currently studying for a Ph.D.	4	2.0
Income (baht)	less than 10,000 baht	133	65.8
	10,001 – 15,000 baht	48	23.8
	15,001 – 20,000 baht	8	4.0
	more than 20,001 baht	13	6.4
Frequency of shuttle bus use	1–3 day(s) per week	47	23.3
	4–5 days per week	70	34.7
	6 days per week or more	53	26.2
	Once a month	32	15.8
Total		202	100

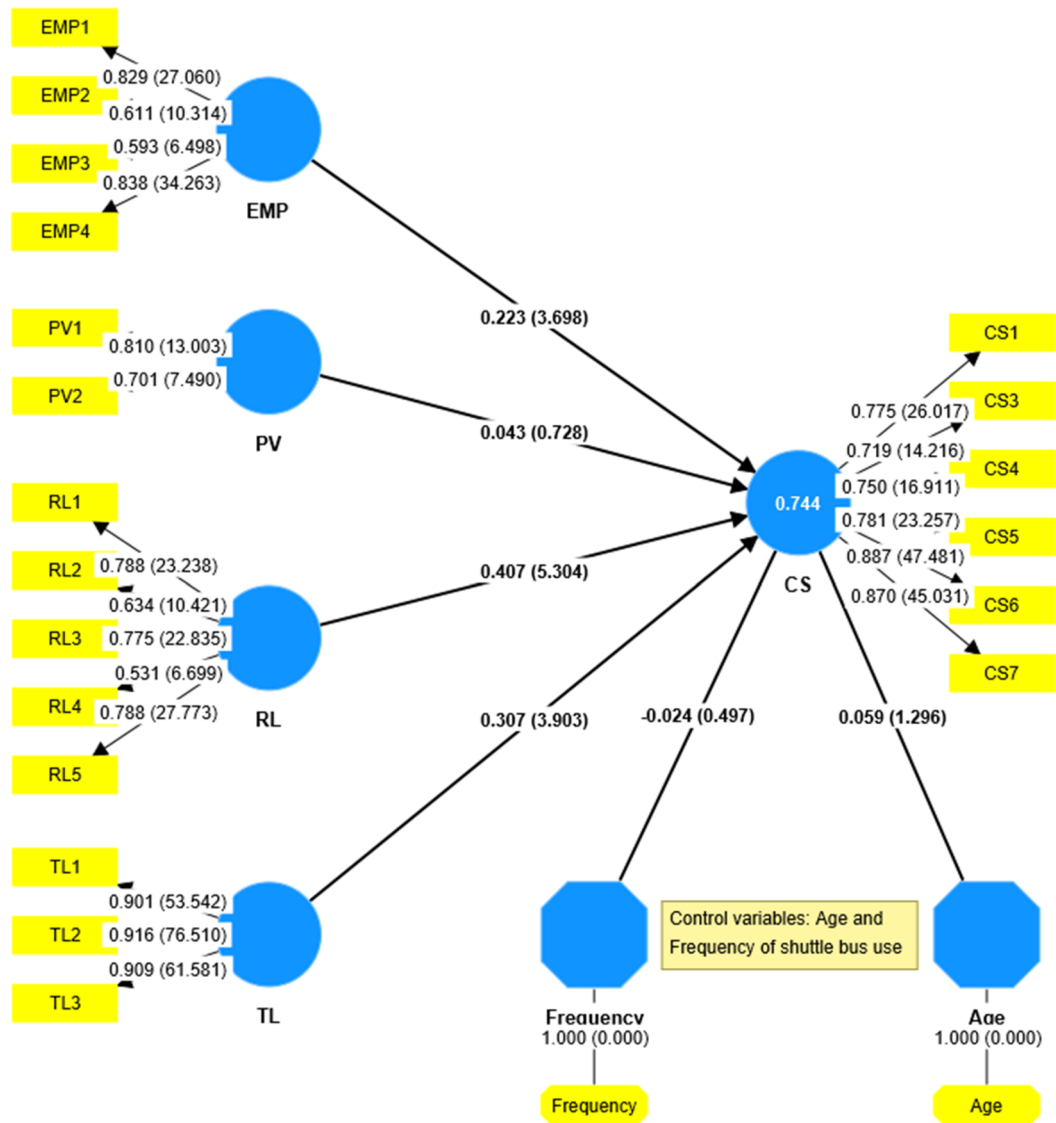
#### 4.2. Measurement model

Items with factor loadings lower than 0.5 were omitted from the measurement model (e.g. PV3, PV4, and SS2) (Figure 2). In this study, we used Smart PLS 4.0, the values of which must be above 0.7, to investigate composite reliability and Cronbach's alpha to verify construct validity (Bujang et al., 2018). Table 3 shows that the composite reliability ranges between 0.728 and 0.934, which is acceptable because the cutoff value of the coefficient rho\_c should be > 0.70. The factor loading of this study is above 0.50, thereby meeting the criteria of convergent validity (Peterson & Kim, 2013; Sann et al., 2023; 2023). The average variance extracted (AVE) is between 0.505 and 0.826, while Cronbach's alpha was above 0.701 (Table 3). A construct's perceived value (CR value) fails to meet these criteria, making it unacceptable (Yi & Gong, 2013). However, according to Farrell (2010), AVE should be higher than 0.5 for it to be accepted. Table 3 shows that all variables passed the measurement criteria, including AVE, the values of which were greater than 0.5.

According to Hasan et al. (2020), the degree to which a test is unrelated to others measuring different constructs is referred to as discriminant validity. To measure this, the square root of AVE is required. To establish discriminant validity, the square root AVE of the construct should be greater than the variance distributed between the construct and the others (Sann et al., 2023). Table 4 presents the discriminant validity of all five constructs. The square root of AVE for each latent construct should be higher than the correlations of any other latent construct (Sann et al., 2023). Figure 2 shows how all variables are associated with each other and how the value of the path coefficient is influenced by every variable (Dewey & Lu, 1959).

#### 4.3. Structural model

A bootstrap approach (confidence interval method: bias-corrected and accelerated bootstrap, two-tailed test, significance level of 0.05) with 5,000 subsamples is used to test the hypotheses. Table 5 lists the standardized coefficients with the corresponding *t*- and *p*-values. SEM shows that the path coefficients from the UPT-LSQ attributes of empathy, reliability, and timeliness to student satisfaction are all statistically significant (EMP → SS:  $\beta=0.219$ ,  $t=3.649$ ,  $p<0.000$ ; RL→ SS:  $\beta=0.424$ ,  $t=5.692$ ,  $p<0.000$ ; TL → SS:  $\beta=0.284$ ,  $t=3.648$ ,  $p<0.000$ ), however, the perceived value attribute is statistically insignificant (PV → SS:  $\beta=0.039$ ,  $t=0.677$ ,  $p=0.499$ ) within the expected directions. Therefore, student satisfaction was influenced by the UPT-LSQ attributes of empathy, reliability, and timeliness (Table 5).



**Figure 2.** Measurement model of the study.

Note. Inner model: path coefficient and *t*-value; outer model: outer weights/loadings and *t*-value.

**Table 3.** Construct reliability and validity.

Constructs	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
SS	0.885	0.891	0.914	0.639
EMP	0.701	0.765	0.814	0.529
PV	0.262	0.267	0.728	0.574
RL	0.752	0.790	0.833	0.505
TL	0.895	0.895	0.934	0.826

Note: EMP: Empathy; PV: Perceived value; RL: Reliability; TL: Timeliness; and SS: Student satisfaction.

**Table 4.** Latent variable correlations, square roots of average variance extracted, and AVE.

Construct	Mean	Std	EMP	PV	RL	TL	SS	AVE
EMP	4.283	0.565	<b>0.727</b>					0.529
PV	4.678	0.460	.561**	<b>0.757</b>				0.574
RL	4.186	0.576	.702**	.571**	<b>0.711</b>			0.505
TL	3.865	1.011	.652**	.572**	.721**	<b>0.908</b>		0.826
SS	4.257	0.739	.710**	.571**	.801**	.755**	<b>0.799</b>	0.639

\*\*Correlation is significant at the 0.01 level (2-tailed).

Note: Bold italic diagonal is the square root of AVE.

Note: EMP, Empathy; PV, Perceived Value; RL, Reliability; TL, Timeliness; SS, Student Satisfaction.

**Table 5.** Results of the structure model.

Construct	$\beta$ value	SD	t-Values	P-values	Supported
EMP $\rightarrow$ SS	0.219	0.060	3.649	0.000	Yes
PV $\rightarrow$ SS	0.039	0.057	0.677	0.499	No
RL $\rightarrow$ SS	0.424	0.075	5.692	0.000	Yes
TL $\rightarrow$ SS	0.284	0.078	3.648	0.000	Yes

## 5. Discussion

Table 4 shows that our findings support  $H_1$ , that is, empathy impacts student satisfaction. This is consistent with previous studies by Abu-Rumman and Qawasmeh (2022) and Saori et al. (2023), who revealed that empathy positively correlates with student satisfaction. Additionally, Michalski and Montes-Botella (2022) stated that, over time, a student's feeling of enhanced service leads to greater satisfaction. As more students use the service and receive better services over time, it gradually enhances their feelings of connection with the service provider, resulting in greater satisfaction. Empathy (including access, information, and comprehension) impresses students that they receive personalized service tailored to their needs and requirements and that they will be pleased with the service, enabling the company to gain a positive reputation (Shahin et al., 2013).

Consistent with Zaim et al. (2013), our findings suggest that reliability positively impacts student satisfaction, thereby supporting  $H_3$ . Likewise, this is consistent with Abu-Rumman and Qawasmeh (2022), who found a strong relationship between reliability and student satisfaction. This implies that service providers perform services dependably and accurately, such as delivering the service on time, keeping promises, and receiving student satisfaction. Restuputri et al. (2021) explained that students are concerned about the safety of goods and services. Furthermore, the behavior and excellence of service providers (e.g. driver abilities) are important factors contributing to a company's success.

Timeliness is an essential factor in student satisfaction with UPT-LSQ (Saura et al., 2008; Uvet, 2020). These findings support  $H_4$ , which suggests that timeliness affects student satisfaction. This is consistent with Saputri and Mulyani (2022), who demonstrated that timeliness and speed are the most important attributes for increasing student satisfaction. Additionally, previous research (e.g. Huma et al., 2019) indicates that the timeliness of shipping companies is a measure of their transportation service capability. In addition, almost all public transportation systems have schedules that specify when a vehicle arrives at a stop. Any heavily used public transportation service should increase the number of trips on the scheduled route and be punctual every time so that frequent travelers intending to use the service can plan their activities around the transportation system (Kilibarda et al., 2016).

Unlike the others, although  $H_2$  assumes that perceived value impacts customer satisfaction, the results prove otherwise. This is in contrast to previous studies (e.g. Miao et al., 2022; Sheng & Fauzi, 2022). This may be because most students were concerned only with whether the service was free. As seen in Figure 2, PV1 (You feel satisfied when you can use the shuttle bus for free) and PV2 (You are satisfied if the shuttle bus starts collecting money for the service) significantly impact student satisfaction. However, students are unwilling to engage in other areas of perceived value (i.e. PV3: Using a shuttle bus can help reduce their daily travel expenses, and PV4: Using a shuttle bus can greatly reduce air pollution), which shows that they do not affect student satisfaction. Hence,  $H_2$  is rejected.

## 6. Conclusion

This study examines the UPT-LSQ (i.e. campus shuttle buses) at KKU. The main objective was to investigate students' satisfaction with university public transportation, specifically, the factors that impact the UPT-LSQ, from the student's perspective. A questionnaire based on factors such as empathy, perceived value, reliability, timeliness, and student satisfaction was distributed to students who used the shuttle bus service. The analysis was conducted PLS-SEM using SSPS 27 and smart PLS 4.0 to validate the accuracy and reliability of each factor. According to the results, three factors related to the UPT-LSQ, namely, empathy, reliability, and timeliness, have a real effect on student satisfaction; however, perceived value does not. Their satisfaction is limited to the free service (PV1) offered by the university shuttle bus service, concluding that most students use the shuttle bus service because they do not want to pay for

transportation and are not interested in anything related to perceived value besides using the service for free. This study offers a better understanding of the factors of (shuttle bus) UPT-LSQ that affect student satisfaction.

### **6.1. Theoretical contributions and practical implications**

This study found that empathy, reliability, and timeliness positively influenced KKU students' satisfaction with the shuttle bus service. Consistent with previous studies, our findings add to the existing literature (Chatathicoon & Tanwanichkul, 2021; Do et al., 2023; Michalski & Montes-Botella, 2022; Prassida & Hsu, 2022), concluding that the aforementioned factors are the primary components of the UPT-LSQ. In addition, this study found that perceived value did not affect student satisfaction with the UPT-LSQ.

The present findings will assist public transportation operators in understanding the perspectives of students who use the service, as well as how they can enhance their service, thereby improving their service delivery image. These findings imply that transportation companies should increase their service frequency, making it easier for customers to use the service at different times, which will help them improve and implement their services. This will make it easier to gather diverse additional information for future research.

### **6.2. Limitations and scope for future research**

This study has certain limitations. First, it was based on only a few primary factors of the UPT-LSQ. Future research should include a variety of factors such as hedonism, affordability, and cleanliness to diversify the data. Second, this study relies solely on university students who use public transportation. This might leave the study lacking context. Further research should consider comparisons with other transportation modes (e.g. private vehicles or bicycles). Third, this study relies solely on self-reported data obtained from self-administered questionnaires. This may have introduced the possibility of a response bias. Thus, future research might consider exploring alternative methods, such as direct observation or interview, to triangulate the study findings. Finally, the sample was comprised only of KKU students. Using a cross-cultural sample (e.g. local vs. international students) will not only help expand the study further but also make it possible to generalize the findings.

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## **Authors' contributions**

Raksmei Sann: Conceptualization, Methodology, Software, Validation, Formal analysis, investigation, resources, data curation, supervision, writing–original draft, writing–review and editing, visualization, project administration, and funding acquisition. Saharat Siripipattaworn: Conceptualization, Methodology, Formal analysis, Data Collection, Writing - Original Draft

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## Data availability statement

Data are available on SANN, RAKSMEY (2024), 'Replication Data for: University Public Transportation Logistics Service Quality and Student Satisfaction: Empirical Evidence on from Thailand', Mendeley Data, V1, doi: [10.17632/4ryppc5jbr.1](https://doi.org/10.17632/4ryppc5jbr.1).

## References

- Abu-Rumman, A., & Qawasmeh, R. (2022). Assessing international students' satisfaction of a Jordanian university using the service quality model. *Journal of Applied Research in Higher Education*, 14(4), 1–14. <https://doi.org/10.1108/JARHE-05-2021-0166>
- Akdere, M., Top, M., & Tekingündüz, S. (2020). Examining patient perceptions of service quality in Turkish hospitals: The SERVPERF model. *Total Quality Management & Business Excellence*, 31(3-4), 342–352. <https://doi.org/10.1080/14783363.2018.1427501>
- Balouei Jamkhaneh, H. B., Shahin, R., & Tortorella, G. L. (2022). Analysis of Logistics 4.0 service quality and its sustainability enabler scenarios in emerging economy. *Cleaner Logistics and Supply Chain*, 4, 100053. <https://doi.org/10.1016/j.clscn.2022.100053>
- Berry, L. L., Parasuraman, A., & Zeithaml, V. A. (1994). Improving service quality in America: Lessons learned. *Academy of Management Perspectives*, 8(2), 32–45. <https://doi.org/10.5465/ame.1994.9503101072>
- Boquet, Y. (2013). *Bus transportation in the Philippines* [Paper presentation]. Proceedings of the 18th Hong Kong Society for Transportation Studies Conference, 'Travel Behaviour and Society, In. The University of Hong Kong.
- Bouzaabia, R., Bouzaabia, O., & Capatina, A. (2013). Retail logistics service quality: A cross-cultural survey on customer perceptions. *International Journal of Retail & Distribution Management*, 41(8), 627–647. <https://doi.org/10.1108/IJRDM-02-2012-0012>
- Bujang, M. A., Omar, E. D., & Baharum, N. A. (2018). A review on sample size determination for Cronbach's alpha test: A simple guide for researchers. *The Malaysian Journal of Medical Sciences: MJMS*, 25(6), 85–99. <https://doi.org/10.21315/mjms2018.25.6.9>
- Chatathicoon, H., & Tanwanichkul, L. (2021). A study of travel behavior and accessibility of shuttle bus in Khon Kaen University. *Journal of Science and Technology Mahasarakham University*, 40(2), 192–202.
- de Oña, J. (2022). Service quality, satisfaction and behavioral intentions towards public transport from the point of view of private vehicle users. *Transportation*, 49(1), 237–269. <https://doi.org/10.1007/s11116-021-10175-7>
- Dewey, D. R., & Lu, K. H. (1959). A correlation and path-coefficient analysis of components of crested wheatgrass seed production 1. *Agronomy Journal*, 51(9), 515–518. <https://doi.org/10.2134/agronj1959.00021962005100090002x>
- Dewi, F. D., Sudjana, G., & Oesman, Y. M. (2011). Patient satisfaction analysis on service quality of dental health care based on empathy and responsiveness. *Dental Research Journal*, 8(4), 172–177. <https://doi.org/10.4103/1735-3327.86032>
- Do, Q. H., Kim, T. Y., & Wang, X. (2023). Effects of logistics service quality and price fairness on customer repurchase intention: The moderating role of cross-border e-commerce experiences. *Journal of Retailing and Consumer Services*, 70, 103165. <https://doi.org/10.1016/j.jretconser.2022.103165>
- Farrell, A. M. (2010). Insufficient discriminant validity: A comment on Bove, Pervan, Beatty, and Shiu (2009). *Journal of Business Research*, 63(3), 324–327. <https://doi.org/10.1016/j.jbusres.2009.05.003>
- Fernandes, D. W., Moori, R. G., & Filho, V. A. V. (2018). Logistic service quality as a mediator between logistics capabilities and customer satisfaction. *Revista de Gestão*, 25(4), 358–372. <https://doi.org/10.1108/REGE-01-2018-0015>
- Franceschini, F., & Rafele, C. (2000). Quality evaluation in logistic services. *International Journal of Agile Management Systems*, 2(1), 49–54. <https://doi.org/10.1108/14654650010312589>
- Gil Saura, I., Ruiz Molina, M. E., & Servera Francés, D. (2008). Logistic service quality and technology: A comparison between supplier–retailer and retailer–consumer relationships. *International Review of Retail, Distribution and Consumer Research*, 18(5), 495–510. <https://doi.org/10.1080/09593960802573385>



- Goldbach, C., Sickmann, J., Pitz, T., & Zimasa, T. (2022). Towards autonomous public transportation: Attitudes and intentions of the local population. *Transportation Research Interdisciplinary Perspectives*, 13, 100504. <https://doi.org/10.1016/j.trip.2021.100504>
- Gulc, A. (2017). Models and methods of measuring the quality of logistic service. *Procedia Engineering*, 182, 255–264. <https://doi.org/10.1016/j.proeng.2017.03.187>
- Gupta, A., Singh, R. K., Mathiyazhagan, K., Suri, P. K., & Dwivedi, Y. K. (2023). Exploring relationships between service quality dimensions and customers satisfaction: Empirical study in context to Indian logistics service providers. *The International Journal of Logistics Management*, 34(6), 1858–1889. <https://doi.org/10.1108/IJLM-02-2022-0084>
- Hasan, A. A., Biswas, C., Roy, M., Akter, S., & Kuri, B. C. Patuakhali Science and Technology University, Faculty of Business Administration and Management, Department of Marketing, Bangladesh. (2020). The applicability of theory of planned behaviour to predict domestic tourist behavioural intention: The case of Bangladesh. *GeoJournal of Tourism and Geosites*, 31(3), 1019–1026. <https://doi.org/10.30892/gtg.31313-536>
- Ho, J. S. Y., Teik, D. O. L., Tiffany, F., Kok, L. F., & Teh, T. Y. (2012a). Logistic service quality among courier services in Malaysia. *International Journal of Trade. Journal of Economics and Finance*, 3(4), 113–117.
- Ho, J. S. Y., Teik, D. O. L., Tiffany, F., Kok, L. F., & Teh, T. Y. (2012b). The moderating effect of local VS. *International Journal of Trade, Economics and Finance*, 257, 3(4), 257–261. <https://doi.org/10.7763/IJTEF.2012.V3.210>
- Huma, S., Ahmed, W., Ikram, M., & Khawaja, M. I. (2019). The effect of logistics service quality on customer loyalty: Case of logistics service industry. *South Asian Journal of Business Studies*, 9(1), 43–61. <https://doi.org/10.1108/SAJBS-10-2018-0114>
- Joshi, A., Kale, S., Chandel, S., & Pal, D. K. (2015). Likert scale: Explored and explained. *British Journal of Applied Science & Technology*, 7(4), 396–403. <https://doi.org/10.9734/BJAST/2015/14975>
- Kadlubek, M., & Grabara, J. (2015). Customers' expectations and experiences within chosen aspects of logistic customer service quality. *International Journal for Quality Research*, 9(2), 265.
- Kadlubek, M., & Jereb, B. (2015). Measurement of the logistic customer service level in commercial cargo motor transport companies. *Logistics & Sustainable Transport*, 5(1), 8–15. <https://doi.org/10.1515/jlst-2015-0002>
- Kilibarda, M., Nikolicic, S., & Andrejic, M. (2016). Measurement of logistics service quality in freight forwarding companies: A case study of the Serbian market. *The International Journal of Logistics Management*, 27(3), 770–794. <https://doi.org/10.1108/IJLM-04-2014-0063>
- Kilibarda, M., Zečević, S., & Vidović, M. (2012). Measuring the quality of logistic service as an element of the logistics provider offering. *Total Quality Management & Business Excellence*, 23(11-12), 1345–1361. <https://doi.org/10.1080/14783363.2012.704279>
- Kuo, Y.-F., Wu, C.-M., & Deng, W.-J. (2009). The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services. *Computers in Human Behavior*, 25(4), 887–896. <https://doi.org/10.1016/j.chb.2009.03.003>
- Le, D. N., Nguyen, H. T., Truong, P. H., Jeong, Y., & Kim, S. (2020). A study of event quality, destination image, perceived value, tourist satisfaction, and destination loyalty among sport tourists. *Asia-Pacific Journal of Marketing and Logistics*, 36(2), 89–103.
- Li, L., Niu, Z., Mei, S., & Griffiths, M. D. (2022). A network analysis approach to the relationship between fear of missing out (FoMO), smartphone addiction, and social networking site use among a sample of Chinese university students. *Computers in Human Behavior*, 128, 107086. <https://doi.org/10.1016/j.chb.2021.107086>
- Lisińska-Kuśnierz, M., & Gajewska, T. (2014). Customer satisfaction with the quality of the logistic services. *Log. Forum*, 10(1), 13–19.
- Miao, M., Jalees, T., Zaman, S. I., Khan, S., Hanif, N-u-A., & Javed, M. K. (2022). The influence of e-customer satisfaction, e-trust and perceived value on consumer's repurchase intention in B2C e-commerce segment. *Asia Pacific Journal of Marketing and Logistics*, 34(10), 2184–2206. <https://doi.org/10.1108/APJML-03-2021-0221>
- Michalski, M., & Montes-Botella, J. L. (2022). Logistics service quality in an emergent market in Latin America. *The International Journal of Logistics Management*, 33(1), 79–101. <https://doi.org/10.1108/IJLM-11-2020-0433>
- Murfield, M., Boone, C. A., Rutner, P., & Thomas, R. (2017). Investigating logistics service quality in omni-channel retailing. *International Journal of Physical Distribution & Logistics Management*, 47(4), 263–296. <https://doi.org/10.1108/IJPDLM-06-2016-0161>
- Peterson, R. A., & Kim, Y. (2013). On the relationship between coefficient alpha and composite reliability. *The Journal of Applied Psychology*, 98(1), 194–198. <https://doi.org/10.1037/a0030767>
- Prassida, G. F., & Hsu, P.-Y. (2022). The harmonious role of channel integration and logistics service in Omnichannel retailing: The case of IKEA. *Journal of Retailing and Consumer Services*, 68, 103030. <https://doi.org/10.1016/j.jretconser.2022.103030>
- Restuputri, D. P., Indriani, T. R., & Masudin, I. (2021). The effect of logistic service quality on customer satisfaction and loyalty using Kansei engineering during the COVID-19 pandemic. *Cogent Business & Management*, 8(1), 1906492. <https://doi.org/10.1080/23311975.2021.1906492>
- Roslan, N. A. A., Wahab, E., & Abdullah, N. H. (2015). Service quality: A case study of logistics sector in Iskandar Malaysia using SERVQUAL model. *Procedia - Social and Behavioral Sciences*, 172, 457–462. <https://doi.org/10.1016/j.sbspro.2015.01.380>

- Sann, R., Jansom, S., & Muennaburan, T. (2023). An extension of the theory of planned behaviour in Thailand cycling tourism: The mediating role of attractiveness of sustainable alternatives. *Leisure Studies*, 43(1), 47–61. <https://doi.org/10.1080/02614367.2023.2182346>
- Sann, R., & Lai, P.-C. (2023). Development of a measuring scale in higher education experience under pandemic: An abstract. In B. Jochims, & J. Allen (Eds.), *Optimistic marketing in challenging times: Serving ever-shifting customer needs* (pp. 165–166). AMSWMC. [https://doi.org/10.1007/978-3-031-24687-6\\_64](https://doi.org/10.1007/978-3-031-24687-6_64)
- Sann, R., Lai, P.-C., & Liaw, S.-Y. (2023). Understanding customers' insights using attribution theory: A text mining and rule-based machine learning two-step multifaceted method. *Applied Sciences*, 13(5), 3073. <https://www.mdpi.com/2076-3417/13/5/3073>. <https://doi.org/10.3390/app13053073>
- Sann, R., Lai, P.-C., Liaw, S.-Y., & Chen, C.-T. (2023). Multidimensional scale development and validation: University service quality (UNIQUAL). *Journal of Hospitality and Tourism Insights*, 6(5), 2565–2594. <https://doi.org/10.1108/JHTI-08-2022-0343>
- Sann, R., Luecha, P., & Rueangchaithanakun, R. (2023). The effects of virtual reality travel on satisfaction and visiting intention utilizing an extended stimulus-organism-response theory: Perspectives from Thai tourists. *Journal of Hospitality and Tourism Insights*, <https://doi.org/10.1108/JHTI-05-2023-0321>
- Saori, S., Alghamdi, A. A., & Fahlevi, M. (2023). Influential factors on student satisfaction in high school sports education: Unravelling the roles of instructor empathy, system quality, and reputation. *Revista de Psicología Del Deporte [Journal of Sport Psychology]*, 32(3), 29–41.
- Saputri, A., & Mulyani, E. (2022). The impact of academic information system to students' satisfaction in higher education. *Studies in Educational Management*, 12, 1–9. <https://doi.org/10.32038/sem.2022.12.01>
- Saura, I. G., Francés, D. S., Contri, G. B., & Blasco, M. F. (2008). Logistics service quality: A new way to loyalty. *Industrial Management and Data Systems*, 108(5), 650–668. <https://doi.org/10.1108/02635570810876778>
- Shahin, A., Pourhamidi, M., Antony, J., & Park, S. H. (2013). Typology of Kano models: A critical review of literature and proposition of a revised model. *International Journal of Quality & Reliability Management*, 30(3), 341–358. <https://doi.org/10.1108/02656711311299863>
- Sheng, M. L., & Fauzi, A. A. (2022). Responding to a disruptive health crisis for higher education institutions: Service Quality and perceived safety effects on student satisfaction. *Journal of Marketing for Higher Education*, 1–23. <https://doi.org/10.1080/08841241.2022.2056282>
- Sorkun, M. F., Hüseyinoğlu, I. Ö. Y., & Börühan, G. (2020). Omni-channel capability and customer satisfaction: Mediating roles of flexibility and operational logistics service quality. *International Journal of Retail & Distribution Management*, 48(6), 629–648. <https://doi.org/10.1108/IJRDM-07-2019-0235>
- Thongkruer, P., & Wanarat, S. (2021). Logistics service quality: Where we are and where we go in the context of airline industry. *Management Research Review*, 44(2), 209–235. <https://doi.org/10.1108/MRR-12-2019-0544>
- Uvet, H. (2020). Importance of logistics service quality in customer satisfaction: An empirical study. *Operations and Supply Chain Management: An International Journal*, 13(1), 1–10. <https://doi.org/10.31387/oscm0400248>
- Yi, Y., & Gong, T. (2013). Customer value co-creation behavior: Scale development and validation. *Journal of Business Research*, 66(9), 1279–1284. <https://doi.org/10.1016/j.jbusres.2012.02.026>
- Zaim, H., Bayyurt, N., & Zaim, S. (2013). Service quality and determinants of customer satisfaction in hospitals: Turkish experience. *International Business & Economics Research Journal (IBER)*, 9(5), 51–58. <https://doi.org/10.19030/iber.v9i5.8145>