RELATIONSHIP BETWEEN SELF-SERVICE TECHNOLOGIES' SERVICE QUALITY, SATISFACTION, ATTITUDINAL AND BEHAVIORAL LOYALTY OF AIRLINE PASSENGERS

Ekkarat Suwannakul[1,*] and Siriporn Khetjenkarn[2]

Abstract

This study aims to examine how the service quality of self-service technologies (SSTs) affects the attitudinal and behavioral loyalty of airline passengers. To examine the service quality in the customer–technology interaction context, this study employs the SSTQUAL scale of Lin and Hsieh (2011). A total of 391 responses were analyzed using a structural equation modelling technique. The results showed that the seven SSTQUAL dimensions reflected the service quality of airline SSTs, supporting the validity of the SSTQUAL scale in the airline context. The study also indicates a strong link between perceived SST service quality and passenger satisfaction. The mediating role of attitudinal loyalty in the link between passenger satisfaction and behavioral loyalty was also revealed. This research improves understanding of the relationship between the service quality of airline SSTs, passenger satisfaction, and two aspects of loyalty.

Keywords: Self-service technology, airline, satisfaction, customer loyalty, SSTQUAL

1. INTRODUCTION

Advanced technology plays a significant role in transforming the operations and services of governments and private firms in numerous countries. Several firms have adopted various types of technology in their provision of customer services and their facilitation of production and operations. Consequently, these firms have gained various benefits from increased productivity and efficiency.

Gains in productivity and service quality can be achieved by increasing self-services (Wirtz, 2018). Thus, self-service technology (SST) plays a crucial role in the present-day travel industry, given that it can help firms to effectively boost their earnings and lower operating costs. SSTs also contribute to service providers in many aspects. Empirical studies have exhibited the direct and indirect effects of SST usage on the consequences of customers' behaviors and attitudes (e.g. customer satisfaction and intentions to use) (Chen & Wang, 2016; Gures et al., 2018; Iqbal et al., 2018). These beneficial consequences arise from customer loyalty in both behavioral and attitudinal aspects.

Airlines are one type of firm applying SST to serve their customers in several stages of service delivery, via websites, mobile applications, and self-service kiosks. Airline

[1,*]Dr. Ekkarat Suwannakul is currently working as a lecturer in the School of Liberal Arts, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand. He obtained a Doctor of Philosophy in Integrated Tourism Management from National Institute of Development Administration, Thailand. https://orcid.org/0000-0003-3368-4827, Email: ekkarat.su@kmitl.ac.th

[2] Dr. Siriporn Khetjenkarn is currently working as a lecturer in the Tourism and Hotel Department, the Faculty of Humanities and Social Sciences, Nakhon Pathom Rajabhat University, Nakhon Pathom, Thailand. She obtained a Doctor of Philosophy in Integrated Tourism Management from National Institute of Development Administration, Thailand. https://orcid.org/0000-0002-6500-6249

SSTs allow passengers to participate directly in the service process without the involvement of service personnel, which benefits the passengers via faster interactions and improved cost effectiveness (Chen & Wang, 2016). Considering the substantial impact of the coronavirus disease (COVID-19) pandemic on air transportation worldwide, SSTs have become even more important for air travel (Monmousseau et al., 2020). Health & safety, and physical distancing regulations have accelerated the usage of contactless SSTs in many airlines. These airlines encourage passengers to use electronic devices when performing specific tasks, which are otherwise typically performed by service staff. The intention is to prevent transmission of the deadly virus by mitigating the risks of exposure. Such technologies are likely to be embraced by present day airline passengers. The International Air Transport Association (IATA), the trade association representing 82% of total air traffic, reported that certain types of SST have become standard (IATA, 2017). SITA (2020), the world's leading specialist in air transport communications and information technology, revealed that 93% of passengers booked their flights with SSTs, indicating the willingness of airline passengers to participate in self-service processes.

However, many passengers are still unwilling to use SSTs due to negative attitudes towards these technologies, such as fear of technology, and fear of failure or feeling ashamed of displaying incompetence in front of others. Some customers even feel that the processing service is not their job and prefer to interact with humans. Poorly designed SSTs and functions that are difficult to use are also factors (Zeithaml et al., 2018). Given that the quality of SST tends to affect passengers' preferences and attitudes in both negative and positive ways, airlines must prioritize these technologies. Thus, airlines should understand passengers' perceptions regarding the service quality of SSTs, to manage a technology-based service delivery system effectively and worthily (Curran et al., 2003), and lead to true customer loyalty (Hennig-Thurau et al., 2002).

Numerous studies have applied the well-known SERVQUAL model of Parasuraman et al. (1988) and the SERVPERF model of Cronin Jr and Taylor (1992) to measure the quality of traditional face-to-face service encounters. However, some researchers have argued that using the mentioned models might be inappropriate to assess the quality of customer–SST service interactions (Lin & Hsieh, 2011; Orel & Kara, 2014). Considering the differences in the service delivery processes between human interactions and customer–technology interactions, these models have faced criticism regarding their reliability and validity in assessing the quality of technology-based services (Suh & Pedersen, 2010).

Ivanov and Webster (2019) indicated that the implementation of automation in tourism and hospitality has gradually influenced the way service quality is measured. Lin and Hsieh (2011) developed the SSTQUAL scale to measure the quality of e-services across different SSTs, channels, and industries. The scale has been employed to examine SST service quality in different environments. Thus, the SSTQUAL scale has been demonstrated to have strong generalisability and is recognized as a comprehensive scale for measuring SST service quality across contexts (Iqbal et al., 2018; Orel & Kara, 2014). However, few empirical studies have applied the scale to explore SST service quality in the airline industry (Shin & Lee, 2012; Yusra & Agus, 2018). Although the total number of air travellers in Thailand has increased threefold during the past 10 years (Civil Aviation Authority of Thailand, 2018), no study has assessed SST service quality from the passenger perspective, using SSTQUAL in the airline context in Thailand (Suwannakul, 2019). Additionally, discussion scarcely exists regarding the influences of SST service quality on the behavioral and attitudinal loyalty of airline passengers.

This study aims to validate the multidimensionality of SSTQUAL in

measuring the service quality of airline SSTs, including an exploration of the relationships among overall perceived SST service quality, passenger satisfaction toward airline SSTs, and the attitudinal and behavioral loyalty of airline passengers. In addition, the mediating role of attitudinal loyalty in the link between passenger satisfaction and behavioral loyalty is also investigated. As most previous studies have investigated one aspect of loyalty only, the current study extends the existing literature by employing SSTQUAL to provide empirical evidence of the comprehensive relationships among passenger satisfaction and dual aspects of loyalty. The current paper initially presents the literature concerning SSTs in the airline context, the SSTQUAL scale, satisfaction, and aspects of customer loyalty, followed by the conceptualized model and associated hypotheses. The results of the quantitative analyses are then presented, followed by a discussion, conclusions, and implications.

2. LITERATURE REVIEW

2.1 SSTs in Airline Context and SSTQUAL Scales

IATA (2019) indicated the trend of growing demand among airline passengers for self-service options. Meanwhile, passengers are likely to be forced to perform services by themselves from the beginning of their journeys (Castillo-Manzano & López-Valpuesta, 2013). By adopting SSTs, airlines can allow passengers to perform flight bookings, check-ins, and to print boarding passes independently. In addition, AI-powered chatbots have been installed on some airline websites for information enquiry services.

SST investment is worth the expense, as airlines have various advantages to gain from using SSTs. These include higher efficiency, lower overall costs, check-in space savings, on-time performance, 24/7 customer service capability, and acquisition of valuable customer data (Chang & Yang, 2008). Customers also gain advantages from feeling more comfortable and having independence from time and space constraints through more convenient channels (Lin & Hsieh, 2011). Customers tend to enjoy both time and cost savings; co-production experience and higher levels of customisation, convenience, efficiency, and flexibility, including allowing customers to purposely avoid contact with service staff (Curran et al., 2003). Such advantages offer experiences that increase customers' perceived value, satisfaction, and engagement (Ivanov & Webster, 2019).

In contrast, some users who are uncomfortable with using technology-based services may feel anxious and stressed. SST cannot instantly recover customer satisfaction from a service failure, which may weaken customer bonds and lead to customer defection. Accordingly, airlines must ensure the high service quality of SSTs, to offer better e-services and experiences in line with customer expectations.

Most previous studies have explored the effects of the quality of airlines' non-technological services on customers' attitudes (Bellizzi et al., 2020). In the digital era, electronic quality also has a profound effect on customers' attitudes and behaviors (Cheng, 2011). Some studies have proposed measures to examine perceived quality in different customer-technology interaction contexts. For example, E-S-QUAL (Parasuraman et al., 2005) and e-SELFQUAL (Ding et al., 2011) were provided specially to assess the quality of websites. Airline firms now offer services through various electronic channels and devices. Thus, the service quality of airlines' SSTs should be assessed by a comprehensive and appropriate scale.

Lin and Hsieh (2011) proposed the SSTQUAL scale, which is considered the best fit for assessing the service quality of airline SSTs in this study, as the scale was developed specially in the customer-SST interaction context. SSTQUAL is composed of 20 items across seven dimensions. (1) Functionality refers to the functional characteristics of the SSTs including responsiveness, reliability, and ease of use; (2) Enjoyment refers to the positive feelings of customers towards SSTs

and the associated service outcomes; (3) Security/privacy refers to perceptions of the safety of SSTs regarding threats and fraud (e.g. concerns of hacking or personal data theft); (4) Assurance represents confidence in the reputation and competence of the service provider; (5) Design refers to the overall design of the SST system including having an interesting system, aesthetically appealing layout, and up-to-date technology; (6) Convenience pertains to the ease of access to the SST services and convenient operating hours; (7) Customisation refers to the capability of SSTs to be personalized according to individual customer needs, preferences, and transaction histories.

The scale has been validated in different contexts, duplicating the scale across a diverse sample of consumer behaviors and industries. The SSTQUAL has been applied to assess the effects of SST service quality in different environments, such as supermarket self-checkouts (Orel & Kara, 2014), airport services (Moon et al., 2021), financial services (Iqbal et al., 2018), and public transportation (Mukhtar et al., 2020).

However, only a few studies have employed the SSTQUAL in exploring service quality in the airline industry. Yusra and Agus (2018) adopted the SSTQUAL dimensions to investigate the quality of AirAsia's self-check-in technology. Shin and Lee (2012) used two dimensions (functionality and security) to measure the impacts of the service quality of airlines' SSTs on passenger satisfaction, reuse intentions, and word-of-mouth. Suwannakul (2021) applied seven dimensions of SSTQUAL to examine the links between technological readiness and SST service quality.

Most studies concerning SSTQUAL have explored the effects of SST service quality on either attitudinal aspects (i.e. intention to use and customer satisfaction), or behavioral aspects of loyalty (i.e. actual purchases, and word-of-mouth). The use of a single loyalty measure is insufficient in understanding the factors underlying loyal purchasing behavior, especially in the service context (Bandyopadhyay & Martell, 2007; Dick & Basu, 1994).

2.2 Customer Loyalty: Attitudinal and Behavioral Aspects

The concept of customer loyalty has been studied for several decades. Past studies have indicated a close association between customer satisfaction, loyalty, and perceived service quality (Orel & Kara, 2014). Wirtz (2018) noted that when customers perceive performance to be above the expected service level, they are reasonably satisfied. Cumulative satisfaction can lead to customer loyalty (Oliver, 1999).

Theoretically, customer loyalty builds first through the attitudinal stages and then proceeds to the behavioral stage (Oliver, 1999; Watson et al., 2015). In the attitudinal stage, customers primarily become cognitively loyal, on the basis of recent experience-based information and will be affectively loyal following pleasurable fulfilment and satisfactory experiences. An intention to repurchase can then be built. When customers overcome obstacles, they will perform actual purchases (behavioral stage) (Han et al., 2011).

Dick and Basu (1994) indicated that true loyalty, the most preferred condition, can be achieved by building a high level of repeat patronage (behavioral loyalty) among customers, and cultivating a relatively high level of customer attitude (attitudinal loyalty). Hence, customer loyalty should be measured by considering two aspects: behavioral and attitudinal loyalty (Dick & Basu, 1994), to avoid competition and reflect further desire, opportunity, and the ability to patronize service providers (Watson et al., 2015).

2.3 Conceptual Model and Hypotheses

This study applied the seven-dimension SSTQUAL scale to examine the causal relationships between perceived SST service quality, passenger satisfaction, and the attitudinal and behavioral loyalty of airline passengers in Thailand. Past studies in the SST context have exhibited positive effects of

service quality on customer satisfaction and several aspects of attitudinal loyalty, and have revealed the positive effects of perceived SST service quality on customer satisfaction (Batouei et al., 2020; Iqbal et al., 2018; Orel and Kara, 2014). Accordingly, the first hypothesis of this study is as follows:

H1: The perceived service quality of the SST has a positive effect on passenger satisfaction.

Several studies have agreed that satisfaction is essential in forming attitudinal loyalty among customers, which can in turn motivate customers to develop intentions to use or purchase, and to actually perform use and purchase behaviors if chance permits (Han et al., 2011; Heskett et al., 1994). Past research has exhibited associations between customer satisfaction toward SSTs and aspects of customer loyalty (Iqbal et al., 2018; Yusra & Agus, 2018). Therefore, the second and third hypotheses were developed as follows:

H2: Passenger satisfaction has a positive effect on attitudinal loyalty.

H3: Passenger satisfaction has a positive effect on behavioral loyalty.

The relationship between attitudinal and behavioral loyalty has been found in empirical research (Bandyopadhyay & Martell, 2007; Carpenter, 2008). Regarding SST, Lee and Yang (2013) found an effect of patronage intentions on actual patronage in a retail setting. Several studies have reported a positive effect of attitudinal loyalty on actual usage (Marakarkandy et al., 2017; Suh & Pedersen, 2010). As already noted, cumulative satisfaction can lead to attitudinal loyalty which can in turn lead to action loyalty (Oliver, 1999). Thus, past studies have revealed a mediating role of attitudinal loyalty in the link between customer satisfaction and behavioral loyalty (Bilgihan et al., 2016; Ikhsan & Simarmata, 2021). Accordingly, the fourth and fifth hypotheses were developed as follows:

H4: Attitudinal loyalty has a positive effect on behavioral loyalty.

H5: Passenger satisfaction has a positive indirect effect on behavioral loyalty via attitudinal loyalty.

Figure 1 illustrates the conceptual model and hypothesized relationships of this study according to the literature.

3. RESEARCH METHODOLOGY

3.1 Research Tool and Measurement Scales

A self-administered questionnaire was used as the research tool in this quantitative research. To ensure accuracy of translation, the measurement items used in the questionnaire were translated into Thai, with a back translation into English being performed by an academic linguistics expert fluent in both Thai and English. The questionnaire underwent validity and reliability tests before the collection of data.

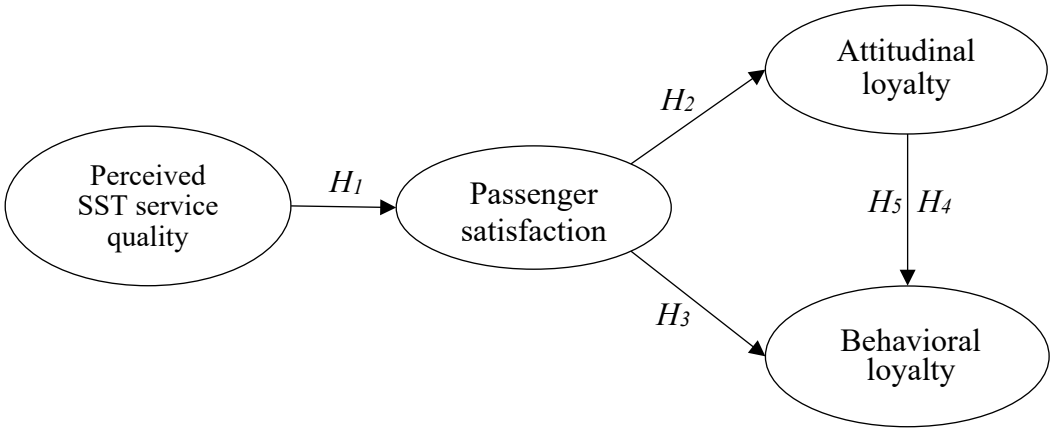


Figure 1 Conceptual Model

The items were reviewed by five experts and evaluated for content validity (Creswell, 2014). All indexes of Item-Objective Congruence (IOC) were higher than the cut-off value of 0.750 (Turner & Carlson, 2003).

Nevertheless, the questionnaire was slightly modified. Four items were added according to experts' suggestions to enhance the questionnaires precision for measuring SST quality in the airline setting. The four additional items included 'I feel that my personal data is protected when using the airline's SST'; 'the airline has a good image that makes you feel assured to use its SST'; 'the overall design of the SST service system is attractive'; and 'using the airline's SST is time-saving'.

The initial questionnaire was revised accordingly. The first section of the questionnaire comprised 10 questions concerning the respondents' personal information, including frequently used airlines; frequently used SST; frequently used SST services; and the demographics of gender, age, educational level, occupation, monthly income, frequency of air travel, and main purpose of travel. The second section, which was developed to measure passengers' perceptions of SST service quality, contained 24 revised items. These items covered variables concerning the seven dimensions of SSTQUAL, initially comprised of 20 items proposed by Lin and Hsieh (2011). In the third section, three items, applied by Iqbal et al. (2018) and Wang (2012), were used to measure passenger satisfaction toward airline SSTs. Five items were included to measure attitudinal loyalty, followed by four items to measure behavioral loyalty. The items employed were taken from the scales proposed by Watson et al. (2015). The rating scale used in this study was a six-point Semantic Differential Scale between polar adjectives (strongest–weakest).

Subsequently, the revised questionnaires were distributed to 30 target respondents to conduct a trial. Cronbach's alpha values of the dimensions ranged from 0.735 to 0.844, greater than the threshold of 0.700, except for the functionality dimension ($\alpha = 0.686$). Nevertheless, alpha values ranging from 0.600 to 0.700 are deemed acceptable in exploratory research (Hair et al., 2010). Thus, the research tool could be considered reliable among the sample and appropriate for data collection.

3.2 Sample and Data Collection

This research aims to examine the perceptions of Thai passengers with experience using the SST services of Thai airlines. An accidental sampling method was applied to collect data at Don Muang International Airport and Suvarnabhumi Airport, located in the Bangkok metropolitan region during different time periods (July–August 2019). To ensure the participation of appropriate respondents for the sample, the questionnaires were distributed to airline passengers who had experienced using the SST services of the airlines, and who agreed to participate in the study. The study followed the ethical practices of Creswell (2014). Instructions and the purposes of the study were provided to respondents prior to the collection of data. Each respondent was notified that their participation was voluntary and that the anonymity and confidentiality of the data collected were of utmost importance. A total of 402 questionnaires were received. Following the data screening process, the final number of questionnaires deemed usable for analysis was 391, amounting to 97.26% of the total number of collected questionnaires.

4. RESULTS

4.1 Sample Characteristics

The total number of respondents in the sample was 391, of which 229 (58.6%) were female. The respondents aged 31–40 years, 20–30 years, and 41–50 years, accounted for 35.6%, 34.0%, and 14.8% of the sample, respectively. Respondents with a bachelor's degree accounted for 66.2% of the sample. In addition, the majority of respondents were private business employees (40.9%). The most common average monthly income was

in the range 10,001–30,000 THB (48.3%). Most of the respondents had travelled with Thai AirAsia (33.2%). The airline website was found to be the most frequently used SST (50.9%), followed by the mobile application and self-service kiosk. Most of the respondents used SSTs for booking their flights (65.7%), travelled around 2–4 times per year (46.0%) and had flown for the purpose of leisure or travel (54.2%).

4.2 Measurement Model

A structural equation modelling (SEM) technique was used to examine the hypotheses and verify the proposed model using Mplus version 7.3. This study employed a reflective measurement model to analyse the structural relationship between the latent construct and its indicators. Jarvis et al. (2003) noted that reflective indicators used for measurement are interchangeable and share a common theme. Indicators reflect the latent construct and have the same antecedents and consequences. In addition, the direction of causality flows from the latent construct to the indicators. Thus, the inclusion or exclusion of one or more indicators does not alter the essence of the construct.

A 1st order confirmatory factor analysis or CFA was employed to confirm the relationships of the indicators to the latent variables (Hair et al., 2010). This analysis confirmed that 26 indicators should remain in the model as shown in Table 1. Meanwhile, ten indicators with factor loadings under 0.500 were eliminated. The CFA result shows that the model fit values passed for all criteria (χ^2/df < 3, CFI > 0.920, TLI > 0.920, RMSEA < 0.080 and SRMR < 0.070) (Hair et al., 2010). The reliability values of the indicators using Cronbach's alpha were in the reasonable range for all constructs (0.673 to 0.844) (Taber, 2018).

The Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity were performed to measure the sampling adequacy. The KMO of all constructs were between 0.500 and 0.714. Bartlett's test of sphericity was significant (p < 0.050), indicating that the tool used in this study was valid and appropriate. The composite reliability (CR) and average variance extracted (AVE) were also examined to indicate the reliability and validity of the measurement scales (Fornell & Larcker, 1981). The CR score (0.674 to 0.840) and all CR values were above 0.60 (Bagozzi & Yi, 1988). The AVE results for each construct were between 0.509 and 0.646, and were therefore higher than the acceptable value of 0.500 (Hair et al., 2010), indicating the convergent validity of the constructs.

To assess the discriminant validity of constructs, a classification system with CI_{CFA} (sys) and χ^2 (sys) was applied to detect the problem of discriminant validity (Fakfare et al., 2021; Rönkkö & Cho, 2020). A 0.900 cut-off value was used for CI_{CFA} (sys) to classify the problem level (Rönkkö & Cho, 2020). As shown in Table 2, a high correlation was found between the constructs of attitudinal and behavioral loyalty (0.812), indicating that the correlation fell into the marginal level. As both constructs were widely used in prior studies (Águila-Obra et al., 2013; Quach et al., 2016), such a problem is not a systematic program or the root cause of the high correlation. As explained by Rönkkö & Cho (2020), it is probably safe to proceed with the further analysis.

The χ^2 (sys) technique was also used for assessing discriminant validity. A cut-off value of 0.850 (greater than 0.812) was used to constrain the comparison model to compare it with the original model. The findings presented in Table 3 show that the difference between the χ^2 values ($\chi^2(0.850) - \chi^2$(original model)) was 10.546, which is greater than 3.84 (Rönkkö & Cho, 2020). Hence, the discriminant validity was deemed acceptable for the model and was supported among the constructs.

Table 4 exhibits the 2nd order CFA model fit values and the factor loadings, with their associated significance values. This consists of all constructs from the 1st order CFA. Therefore, in this step, all elements were confirmed to be the variables of SST service quality.

Table 1 Results of the 1st Order Confirmatory Factor Analysis (CFA)

Construct Indicator	Factor Loadings	t-value	CR	AVE
Functionality (α = 0.781, KMO = 0.500)			0.785	0.646
1) With the airline's SST, I can complete my service in a short time.	0.849	24.125**		
2) The service process of the airline's SST is clear.	0.757	21.055**		
Enjoyment (α = 0.673, KMO = 0.500)			0.674	0.509
1) I feel good being able to use the SSTs.	0.720	19.100**		
2) The airline's SST has interesting additional functions.	0.707	18.636**		
Security/privacy (α = 0.844, KMO = 0.711)			0.840	0.638
1) I feel that my personal data is protected when using the airline's SST.	0.860	39.335**		
2) I feel safe in my transaction with the airline's SST.	0.777	30.000**		
3) A clear privacy policy is stated when I use the airline's SST.	0.756	26.764**		
Assurance (α = 0.778, KMO = 0.684)			0.780	0.544
1) The airline providing the SST has a good reputation.	0.818	29.913**		
2) The airline has a good image that makes you feel assured to use its SST.	0.724	22.870**		
3) The airline providing the SST is well-known.	0.664	18.963**		
Design (α = 0.743, KMO = 0.650)			0.756	0.511
1) The airline's SST appears to use up-to-date technology.	0.771	24.670**		
2) The layout of the airline's SST is aesthetically appealing.	0.758	24.013**		
3) The overall design of the SST system is attractive.	0.605	14.664**		
Convenience (α = 0.703, KMO = 0.500)			0.726	0.580
1) Using the airline's SST is time-saving.	0.897	21.236**		
2) The SST has operating hours convenient to customer.	0.597	13.960**		
Customisation (α = 0.788, KMO = 0.707)			0.784	0.548
1) The firm's SST has features that are personalized for me.	0.797	27.756**		
2) The airline's SST understands my specific needs.	0.711	21.661**		
3) The airline's SST has my best interests at heart.	0.710	21.058*		
Satisfaction (α = 0.786, KMO = 0.659)			0.834	0.629
1) The SSTs offered by the airline exceed my expectations.	0.871	43.945**		
2) Overall, I am satisfied with the SSTs offered by the airline.	0.809	35.101**		
3) The SSTs offered by the airline are close to my ideal SSTs.	0.690	22.327**		
Attitudinal loyalty (α = 0.804, KMO = 0.714)			0.813	0.592
1) I prefer using this airline services more than those of other airlines.	0.774	28.159**		
2) I enjoy using the products or services of this airline.	0.769	27.452**		
3) I always consider this airline as my first-choice carrier.	0.767	27.231**		
Behavioral loyalty (α = 0.753, KMO = 0.500)			0.756	0.608
1) I fly with this airline more often than other airlines.	0.816	24.813**		
2) I often recommend this airline to others.	0.743	21.705**		

Model Fit indices: *χ^2= 521.455 (p = 0.000), df= 252, CFI = 0.940, TLI = 0.923, RMSEA = 0.052, SRMR = 0.048*

Note: ** = $p < 0.001$

Table 2 Confidence Intervals for the Correlations Obtained from CFA

	1	2	3	4	5	6	7	8	9	10
1. Functionality	**1**	*0.601*	*0.219*	*0.313*	*0.395*	*0.519*	*0.393*	*0.553*	*0.332*	*0.340*
2. Enjoyment	[.491,.711]	**1**	*0.513*	*0.527*	*0.667*	*0.511*	*0.547*	*0.653*	*0.495*	*0.451*
3. Security/Privacy	[.103,.336]	[.404,.622]	**1**	*0.523*	*0.356*	*0.395*	*0.456*	*0.491*	*0.283*	*0.276*
4. Assurance	[.198,.429]	[.416,.638]	[.428,.617]	**1**	*0.634*	*0.508*	*0.326*	*0.436*	*0.431*	*0.287*
5. Design	[.279,.511]	[.561,.774]	[.243,.468]	[.542,.725]	**1**	*0.414*	*0.497*	*0.552*	*0.455*	*0.378*
6. Convenience	[.409,.629]	[.394,.628]	[.291,.500]	[.400,.615]	[.293,.534]	**1**	*0.510*	*0.587*	*0.266*	*0.161*
7. Customisation	[.282,.503]	[.438,.656]	[.354,.559]	[.211,.440]	[.392,.603]	[.410,.610]	**1**	*0.627*	*0.399*	*0.349*
8. Satisfaction	[.460,.646]	[.559,.747]	[.398,.584]	[.334,.539]	[.456,.648]	[.494,.680]	[.543,.711]	**1**	*0.519*	*0.496*
9. Attitudinal loyalty	[.216,.449]	[.382,.609]	[.171,.394]	[.325,.537]	[.348,.562]	[.146,.386]	[.291,.507]	[.426,.613]	**1**	*0.732*
10. Behavioral loyalty	[.219,.461]	[.329,.573]	[.160,.391]	[.167,.406]	[.260,.495]	[.038,.285]	[.233,.465]	[.396,.597]	[.653,.812]	**1**

Note: Values above the diagonal (italicized) represent the correlations between the latent constructs.
Values below the diagonal (in square parentheses) represent the correlation values of latent constructs at the 2.5% lower / upper bound.

Table 3 Discriminant Validity Using CI_{CFA} (sys) and χ^2 (sys) (n = 391)

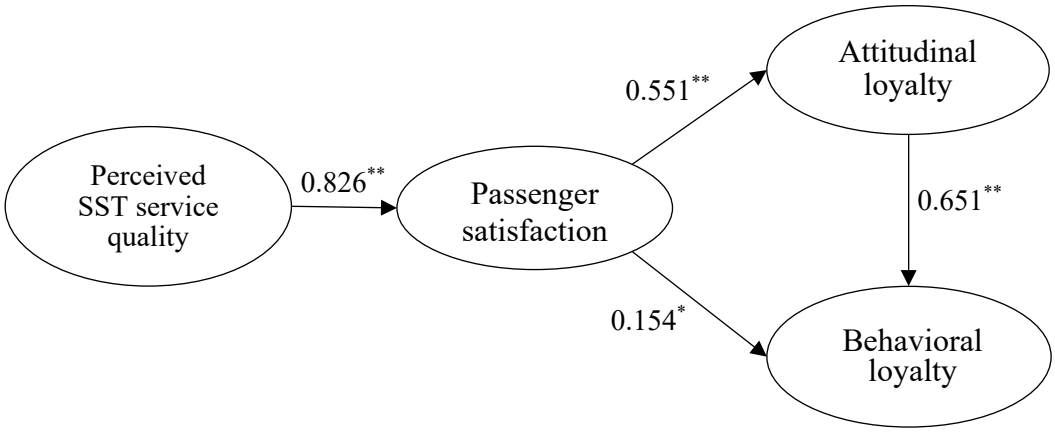
Variable		**Behavioral loyalty**
Attitudinal loyalty	Estimated ρ_{CFA}	0.732
	Confidence Interval ρ_{CFA}	[0.627,0.838]
	p-value	0.000
	Degree of problem	Marginal
Model fit indices for nested model test		
a. A model with a fixed correlation of 0.850	$\chi2$ = 532.001 (*p* = 0.000), df = 253, CFI = 0.938, TLI = 0.920, RMSEA = 0.053 SRMR=0.050	
b. Original model	$\chi2$ = 521.455 (*p* = 0.000), df = 252, CFI = 0.940, TLI = 0.923, RMSEA = 0.052 SRMR = 0.048	
Difference of a - b	$\chi2$ = 10.546 (*p* = 0.001), df = 1	

Note: $\chi^2(0.850) - \chi^2$(original model) > 3.840, ρ_{CFA} = factor correlation based on CFA

Table 4 Results of 2nd Order CFA

2nd order construct	**1st order construct**	**Factor Loadings**	**t-value**
Perceived SST service quality	Design	0.872	20.438*
	Enjoyment	0.855	21.131*
	Convenience	0.708	15.333*
	Assurance	0.674	15.911*
	Customisation	0.657	15.019*
	Functionality	0.619	13.293*
	Security/privacy	0.592	13.132*
Model Fit indices:			
χ^2 = 298.936 (p = 0.000), df = 123, CFI = 0.938, TLI = 0.923, RMSEA = 0.060, SRMR = 0.056			

Note: * = *p* < 0.001



The indirect effect of passenger satisfaction on behavioral loyalty via attitudinal loyalty ($\beta = 0.359^{**}$)

Chi-squared = 590.066 ($p = 0.000$), df = 279, CFI = 0.931, TLI = 0.920, RMSEA = 0.053, SRMR = 0.058

Note: $^{*}p < 0.050$, $^{**}p < 0.001$

Figure 2 SEM of the Relationships between Constructs

4.3 SEM Results

The structural equation model (SEM) was analyzed by considering the consistency of the empirical data in examining the relationships between the perceived service quality of the SSTs, passenger satisfaction, attitudinal loyalty, and behavioral loyalty. The results of the model (Figure 2) exhibit an acceptable fit and significant standardized coefficients.

The mediating role of attitudinal loyalty was tested by using a bootstrap technique with 5,000 resamples (Preacher & Hayes, 2008). The results ($\beta = 0.359$, 99.5% CI = [0.209, 0.508], $^{**}p < 0.001$) indicated that excluding zero reveals a significant indirect effect of passenger satisfaction on behavioral loyalty via attitudinal loyalty.

The Sobel test was also applied to affirm the mediating role. The result ($z = 8.041$, $p = 0.000$) indicates that the association between passenger satisfaction and behavioral loyalty is significantly mediated by attitudinal loyalty. When considering the proportion of the indirect effect ($\beta = 0.359$, $^{**}p < 0.001$) to the total effect ($\beta = 0.513$, $^{**}p < 0.001$) (Sobel, 1982), attitudinal loyalty was found to mediate 69.980% of the total effect of passenger satisfaction on behavioral loyalty.

5. DISCUSSION

This study investigates the relationships among the perceived service quality of SSTs, passenger satisfaction, attitudinal loyalty, and behavioral loyalty, of airline passengers, utilising the SSTQUAL scale developed in the customer-SST interaction context.

Firstly, the results indicate that the dimensions of design, enjoyment, convenience, assurance, customization, functionality, and security/privacy reflect the perceived SST service quality of airline passengers, which is in line with the results of past studies (Batouei et al., 2020; Iqbal et al., 2018; Ul Hassan et al., 2020). Specifically, design was found to be the most important, while security/privacy was the least important among the dimensions. This result is consistent with those of Yusra and Agus (2018), who confirmed the significance of the SSTQUAL dimensions for airline self-check-in systems, wherein the least important among the dimensions perceived by customers was security/privacy. According to

the results, technology is reliable, and passengers are familiar with self-services at present. Passengers therefore have a higher degree of trust in airline SSTs concerning security and confidentiality of user data. However, Orel and Kara (2014) found that security/privacy did not contribute to the model due to the low concern of customers at physical stores compared to online channels.

As hypothesized, the SEM result reveals a strong effect of SST service quality on passenger satisfaction (H_1), as found in previous studies (Batouei et al., 2020; Iqbal et al., 2018; Yusra & Agus, 2018). It can be explained that satisfaction is a post-consumption experience that is influenced by the passenger's perception of service delivery (Wirtz, 2018).

Secondly, the H_2 testing result shows a positive effect of passenger satisfaction on attitudinal loyalty, which is in line with past research (Batouei et al., 2020; Iqbal et al., 2018; Jaiswal & Niraj, 2011). Accordingly, this study affirms the crucial role of satisfaction in forming passengers' attitudinal loyalty, which in turn influences behavioral intentions and actual use when chance permits (Han et al., 2011; Oliver, 1999). Although some previous studies did not find a direct effect of customer satisfaction on behavioral loyalty (Silver et al., 2020; Suh & Pedersen, 2010), this study indicates a relatively low direct effect of passenger satisfaction on behavioral loyalty (H_3), as also found in past research (Antwi et al., 2020; Wilkins et al., 2009). This can be further explained through the case of spuriously loyal customers as they continue to use the firm's service (behavioral loyalty) despite being slightly satisfied or dissatisfied with the service (Dick & Basu, 1994; Sun et al., 2021).

Thirdly, this study reveals a strong positive effect of attitudinal loyalty on behavioral loyalty (H_4), which is consistent with previous studies (Bandyopadhyay & Martell, 2007; Carpenter, 2008; Lee & Yang, 2013). This result offers clear evidence in support of the loyalty development theory, explaining that customer loyalty builds first through the attitudinal stages and then proceeds to the behavioral stage (Han et al., 2011; Oliver, 1999). In this case, passengers primarily become cognitively loyal, then affectively loyal, following satisfactory experience of SST usage. Intentions to reuse airline services can then be formed and when passengers overcome obstacles, they will perform actual usage (behavioral stage).

Lastly, this study reveals an indirect effect of passenger satisfaction on behavioral loyalty via attitudinal loyalty (H_5). Consequently, the empirical results affirm a strong association between customer satisfaction and loyalty (Cronin Jr & Taylor, 1992; Orel & Kara, 2014; Oliver, 1999). According to the strength of the path coefficients, the effect of passenger satisfaction on behavioral loyalty via attitudinal loyalty is much stronger than its direct effect on behavioral loyalty in this study. Therefore, the result supports the key role of attitudinal loyalty as a mediator of behavioral loyalty as indicated in previous research (Bilgihan et al., 2016; Ikhsan & Simarmata, 2021; Suh & Pedersen, 2010).

6. CONCLUSION AND RECOMMENDATIONS

This study presents empirical evidence validating the multidimensionality of SSTSQUAL in the airline context, which supports its generalizability. The study contributes to the existing literature by using the SSTQUAL scale to provide evidence of the comprehensive relationship between SST service quality, passenger satisfaction, and the dual aspects of passenger loyalty, as most previous studies have investigated only a single aspect. Moreover, this study exhibits a strong relationship between perceived SST service quality and passenger satisfaction. The results also confirm the mediation effect of attitudinal loyalty on the behavioral loyalty of airline passengers, providing evidence of the development of true customer loyalty. Therefore, this study concludes that passengers would not continuously patronize an airline firm if they could not accumulate positive feelings towards the firm, given that

attitudinal loyalty is the crucial driver of passenger behavior. To develop true loyalty, an airline should know how to and what to focus on to enhance the service quality of its available SSTs, to effectively respond to passengers' needs and preferences.

6.1 Implications

The results provide crucial implications, at least for practitioners, to profoundly understand the service quality dimensions, passenger satisfaction and dual aspects of loyalty in an airline setting. This study reveals that the performances of the seven dimensions conjointly form the overall perceptions of the SST service quality of passengers, which significantly influence their satisfaction and loyalty. Therefore, airline firms should reinforce passengers' experiences by improving their perceptions of SST service quality to enhance their overall memorable experiences towards SST use, especially regarding the design of the overall system and enjoyment.

In developing the design of the SST system, the attractiveness of the overall system with up-to-date technology and an aesthetically appealing layout must be considered. To increase enjoyment, airlines should arouse passengers' positive feelings during SST delivery, and seek additional functions that can attract passenger interests (Iqbal et al., 2018). Providing convenience to passengers in terms of saving time, including having an anywhere/anytime service is also an important indicator of airline SST service quality. Individual airline firms should also consider providing personalized features in their SSTs (customisation), maintaining a good reputation and image of their brand (assurance), ensuring ease of use of the SSTs and clear service processes (functionality), and offering high security and privacy standards to gain passengers' confidence when using SSTs.

6.2 Limitations and Recommendations

This study has certain limitations as with any research. Firstly, as data collection for this study was mostly conducted in airport departure halls, some respondents had limited time to finish the survey, thereby generating some incomplete questionnaire responses. Thus, future research that expects to collect data from passengers at airports should design a concise and easy-to-read questionnaire to accommodate respondents' time constraints. Secondly, this study provides additional knowledge on the airline business as a whole, by examining all operating airlines in Thailand. To provide additional support for this study, future research may examine perceived SST service quality, passenger satisfaction, and loyalty, by specifying each airline's business model, such as low-cost airlines, full-service airlines, and charter airlines. Thirdly, different types of SSTs and generations of customers should be pursued to understand the differences among them. Fourthly, although the results reveal significant and positive effects of SST service quality on the vital outcome (i.e. customer loyalty), other related variables require further exploration. Future research must consider employing other moderating variables (i.e. demographic factors and perceived risk) and dependent variables (i.e. brand experience, customer experience, and customer engagement) to examine the roles of relating variables and the effects of SST service quality on different service outcomes. Lastly, future studies should explore the effects of each SSTQUAL dimension on passenger satisfaction and loyalty by using a variance-based method and applying a formative measurement approach to further assess the structural relationship between perceived SST service quality and its indicators, which may help to provide other meaningful implications for airline firms.

REFERENCES

Águila-Obra, A. R. D., Padilla-Meléndez, A., & Al-dweeri, R. M. O. O. (2013). The influence of electronic service quality on loyalty in postal services: the mediating role of satisfaction. *Total Quality*

Management & Business Excellence, 24(9-10), 1111-1123. https://doi.org/10.1080/14783363.2013.807681

Antwi, C. O., Fan, C.-j., Nataliia, I., Aboagye, M. O., Xu, H., & Azamela, J. C. (2020). Do airport staff helpfulness and communication generate behavioral loyalty in transfer passengers? A conditional mediation analysis. *Journal of Retailing and Consumer Services, 54*, 102002. https://doi.org/10.1016/j.jretconser.2019.102002

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, *16*(1), 74-94. https://doi.org/10.1007/BF02723327

Bandyopadhyay, S., & Martell, M. (2007). Does attitudinal loyalty influence behavioral loyalty? A theoretical and empirical study. *Journal of Retailing and Consumer Services, 14*(1), 35-44. https://doi.org/10.1016/j.jretconser.2006.03.002

Batouei, A., Iranmanesh, M., Mustafa, H., Nikbin, D., & Ping, T. A. (2020). Components of airport experience and their roles in eliciting passengers' satisfaction and behavioural intentions. *Research in Transportation Business & Management, 37*, 100585. https://doi.org/10.1016/j.rtbm.2020.100585

Bellizzi, M. G., Eboli, L., & Mazzulla, G. (2020). An online survey for the quality assessment of airlines' services. *Research in Transportation Business & Management*, *37*, 100515. https://doi.org/10.1016/j.rtbm.2020.100515

Bilgihan, A., Madanoglu, M., & Ricci, P. (2016). Service attributes as drivers of behavioral loyalty in casinos: The mediating effect of attitudinal loyalty. *Journal of Retailing and Consumer Services*, *31*, 14-21. https://doi.org/10.1016/j.jretconser.2016.03.001

Carpenter, J. M. (2008). Consumer shopping value, satisfaction and loyalty in discount retailing. *Journal of Retailing and Consumer Services, 15*(5), 358-363. https://doi.org/10.1016/j.jretconser.2007.08.003

Castillo-Manzano, J. I., & López-Valpuesta, L. (2013). Check-in services and passenger behaviour: Self service technologies in airport systems. *Computers in Human Behavior, 29*(6), 2431-2437. https://doi.org/10.1016/j.chb.2013.05.030

Chang, H.-L., & Yang, C.-H. (2008). Do airline self-service check-in kiosks meet the needs of passengers? *Tourism Management, 29*(5), 980-993. https://doi.org/10.1016/j.tourman.2007.12.002

Chen, C.-F., & Wang, J.-P. (2016). Customer participation, value co-creation and customer loyalty–A case of airline online check-in system. *Computers in Human Behavior, 62*(September 2016), 346-352. https://doi.org/10.1016/j.chb.2016.04.010

Cheng, Y.-H. (2011). Evaluating web site service quality in public transport: Evidence from Taiwan high speed rail. *Transportation Research Part C: Emerging Technologies, 19*(6), 957-974. https://doi.org/10.1016/j.trc.2011.04.003

Civil Aviation Authority of Thailand. (2018). *Future plans on policies, regulations and initiatives to promote aerospace investments in Thailand*. Retrieved from https://www.caat.or.th/wp-content/uploads/2018/01/Future-Plans-of-Aerospce-MRO-OEM-sectors-in-Thailand-2.0-1.pdf

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). Thousand Oaks, CA: SAGE.

Cronin Jr, J. J., & Taylor, S. A. (1992). Measuring Service Quality: A Re-examination and Extension. *Journal of Marketing, 56*(3), 55-68. https://doi.org/10.1177/002224299205600304

Curran, J. M., Meuter, M. L., & Surprenant, C. F. (2003). Intentions to use self-service technologies: a confluence of multiple attitudes. *Journal of Service Research, 5*(3), 209-224. https://doi.org/10.1177/1094670502238916

Dick, A. S., & Basu, K. J. (1994). Customer loyalty: toward an integrated conceptual framework. *Journal of the Academy of Marketing Science, 22*(2), 99-113. https://doi.org/10.1177/0092070394222001

Ding, D. X., Hu, P. J.-H., & Sheng, O. R. L. (2011). e-SELFQUAL: A scale for measuring online self-service quality. *Journal of Business Research, 64*(5), 508-515. https://doi.org/10.1016/j.jbusres.2010.04.007

Fakfare, P., Cho, G., Hwang, H., & Manosuthi, N. (2021). Examining the sensory impressions, value perception, and behavioral responses of tourists: the case of floating markets in Thailand. *Journal of Travel & Tourism Marketing, 38*(7), 666-681. https://doi.org/10.1080/10548408.2021.1985042

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39-50. https://doi.org/10.1177/002224378101800104

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis* (7th ed.). Harlow, Essex: Pearson.

Han, H., Kim, Y., & Kim, E.-K. (2011). Cognitive, affective, conative, and action loyalty: Testing the impact of inertia. *International Journal of Hospitality Management, 30*(4), 1008-1019. https://doi.org/10.1016/j.ijhm.2011.03.006

Heskett, J. L., Jones, T. O., Loveman, G. W., Sasser, W. E., & Schlesinger, L. A. (1994). Putting the service-profit chain to work. *Harvard Business Review, 72*(2), 164-174.

IATA. (2019). *IATA global passenger survey*. Retrieved from https://www.iata.org/contentassets/952a287130554b4880563edca1c8944f/iata-2019-gps-highlights.pdf

IATA. (2017). *2017 Global passenger survey*. Retrieved from http://airlines.iata.org/sites/default/files/DAY%202.FINAL-6.pdf

Ikhsan, R., & Simarmata, J. (2021). SST-Servqual and customer outcomes in service industry: Mediating the rule of corporate reputation. *Management Science Letters, 11*(2), 561-576. https://doi.org/10.5267/j.msl.2020.9.010

Iqbal, M. S., Ul Hassan, M., & Habibah, U. (2018). Impact of self-service technology (SST) service quality on customer loyalty and behavioral intention: The mediating role of customer satisfaction. *Cogent Business & Management, 5*(1), 1-23. https://doi.org/10.1080/23311975.2018.1423770

Ivanov, S., & Webster, C. (2019). *Robots, Artificial Intelligence, and Service Automation in Travel, Tourism and Hospitality*. Bingley, England: Emerald.

Jaiswal, A. K., & Niraj, R. (2011). Examining mediating role of attitudinal loyalty and nonlinear effects in satisfaction-behavioral intentions relationship. *Journal of Services Marketing, 25*(3), 165-175. https://doi.org/10.1108/08876041111129155

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research*, *30*(2), 199-218. https://doi.org/10.1086/376806

Lee, H.-J., & Yang, K. (2013). Interpersonal service quality, self-service technology (SST) service quality, and retail patronage. *Journal of Retailing and Consumer Services, 20*(1), 51-57.

https://doi.org/10.1016/j.jretconser.2012.10.005

Lin, J.-S. C., & Hsieh, P.-L. (2011). Assessing the self-service technology encounters: development and validation of SSTQUAL scale. *Journal of Retailing, 87*(2), 194-206. https://doi.org/10.1016/j.jretai.2011.02.006

Marakarkandy, B., Yajnik, N., & Dasgupta, C. (2017). An empirical examination with an augmented technology acceptance model (TAM). *Journal of Enterprise Information Management, 30*(2), 263-294. https://doi.org/10.1108/JEIM-10-2015-0094

Monmousseau, P., Marzuoli, A., Feron, E., & Delahaye, D. (2020). Impact of Covid-19 on passengers and airlines from passenger measurements: Managing customer satisfaction while putting the US air transportation system to sleep. *Transportation Research Interdisciplinary Perspectives*, *7*, 100179. https://doi.org/10.1016/j.trip.2020.100179

Moon, H. G., Lho, H. L., & Han, H. (2021). Self-check-in kiosk quality and airline non-contact service maximisation: how to win air traveler satisfaction and loyalty in the post-pandemic world? *Journal of Travel & Tourism Marketing, 38*(4), 383-398. https://doi.org/10.1080/10548408.2021.1921096

Mukhtar, N. D., Afthanorhan, A., Ghazali, P. L., & Foziah, H. (2020). A conceptual paper for self-service technology (SST) on grabcar users. *Humanities and Social Sciences Reviews*, *8*(2), 569-578. https://doi.org/10.18510/hssr.2020.8265

Oliver, R. L. (1999). Whence consumer loyalty? *Journal of Marketing, 63* (Special Issue), 33-44. https://doi.org/10.1177/0022242999063 4s105

Orel, F. D., & Kara, A. (2014). Supermarket self-checkout service quality, customer satisfaction, and loyalty: Empirical evidence from an emerging market. *Journal of Retailing and Consumer Services, 21*(2), 118-129. https://doi.org/10.1016/j.jretconser.2013.07.002

Quach, T. N., Thaichon, P., & Jebarajakirthy, C. (2016). Internet service providers' service quality and its effect on customer loyalty of different usage patterns. *Journal of Retailing and Consumer Services, 29*, 104-113. https://doi.org/10.1016/j.jretconser.2015.11.012

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing, 64*(1), 12-40.

Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). ES-QUAL: A multiple-item scale for assessing electronic service quality. *Journal of Service Research, 7*(3), 213-233. https://doi.org/10.1177/1094670504271156

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879-891. https://doi.org/10.3758/BRM.40.3.879

Rönkkö, M., & Cho, E. (2022). An updated guideline for assessing discriminant validity. *Organizational Research Methods, 25*(1), 6-14. https://doi.org/10.1177/1094428120968614

Silver, R. A., Subramaniam, C., & Stylianou, A. (2020). The impact of portal satisfaction on portal use and health-seeking behavior: Structural equation analysis. *Journal of Medical Internet Research*, *22*(3), e16260. http://doi.org/10.2196/16260

Shin, C. H., & Lee, H. J. (2012). A study on airlines' self-service technology (SST) quality affecting customer satisfaction and behavioral intention. *Tourism Management Research, 16*(2), 97-117.

SITA. (2020). *Passenger IT Insights 2020*. Retrieved from https://www.sita.aero/globalassets/docs/surveys--reports/passenger-it-insights-2020.pdf

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology, 13*, 290-312. https://doi.org/10.2307/270723

Suh, Y. I., & Pedersen, P. M. (2010). Participants' service quality perceptions of fantasy sports websites: The relationship between service quality, customer satisfaction, attitude, and actual usage. *Sport Marketing Quarterly, 19*(2), 78.

Sun, S., Xu, L., Yao, Y., & Duan, Z. (2021). Investigating the determinants to retain spurious-loyalty passengers: A data-fusion based approach. *Transportation Research Part A: Policy and Practice, 152*, 70-83. https://doi.org/10.1016/j.tra.2021.08.005

Suwannakul, E. (2019). Applications of the SSTQUAL scale for self-service technology quality assessment: A case of airline business in Thailand. *Journal of International Thai Tourism Journal, 15*(2), 106-120.

Suwannakul, E. (2021). Role of technology readiness in airline passengers' perceptions of self-service technology quality. *African Journal of Hospitality, Tourism and Leisure*, *10*(2), 670-681. https://doi.org/10.46222/ajhtl.19770720-125

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, *48*(6), 1273-1296. https://doi.org/10.1007/s11165-016-9602-2

Turner, R. C., & Carlson, L. (2003). Indexes of item-objective congruence for multidimensional items. *International Journal of Testing, 3*(2), 163-171. https://doi.org/10.1207/S15327574IJT0302_5

Ul Hassan, M., Iqbal, M. S., & Habibah, U. (2020). Self-service technology service quality: Building loyalty and intention through technology trust in Pakistani service sector. *SAGE Open, 10*(2), 1-19. https://doi.org/10.1177/2158244020924412

Wang, M.C.–H. (2012). Determinants and consequences of consumer satisfaction with self-service technology in a retail setting. *Managing Service Quality: An International Journal, 22*(2), 128-144. https://doi.org/10.1108/09604521211218945

Watson, G. F., Beck, J. T., Henderson, C. M., & Palmatier, R. W. (2015). Building, measuring, and profiting from customer loyalty. *Journal of the Academy of Marketing Science, 43*(6), 790-825. https://doi.org/10.1007/s11747-015-0439-4

Wilkins, H., Merrilees, B., & Herington, C. (2009). The determinants of loyalty in hotels. *Journal of Hospitality Marketing & Management, 19*(1), 1-21. https://doi.org/10.1080/19368620903327626

Wirtz, J. (2018). *Essentials of Services Marketing* (3rd ed.). Harlow, Essex: Pearson.

Yusra, & Agus, A. (2018). The Influence of Perceived Service Quality Towards Customer Satisfaction and Loyalty in Airasia Self Check-In System. *Journal of Social Sciences Research,* (Special Issue 2), 766-775. https://doi.org/10.32861/jssr.spi2.766.775

Zeithaml, V. A., Bitner, M. J., & Gremler, D. D. (2018). *Services Marketing: Integrating Customer Focus Across the Firm* (7th ed.). New York, NY: McGraw Hill.