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The Effect of Technology Anxiety on the Acceptance of Public Self-Service Technologies: The Moderating Role of Perceived Crowding

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Abstract

Self-service technologies (SSTs), including ATMs, Internet banking and self-service kiosks are changing traditional banking service interactions. While many studies have investigated customer acceptance of SSTs, few have investigated how psychological and environmental conditions interact and affect customers' acceptance of public SSTs, especially in developing countries. The existing literature has focused on technology anxiety and perceived crowding effects separately, providing limited information on their co-occurrence in public banking contexts.

Therefore, this study examines how technology anxiety affects customers' attitudes towards PSS technology adoption in the banking sector and examines how the relationship is moderated by perceived crowding. A quantitative approach using a structured questionnaire was employed with 232 banking customers using public SSTs in Sri Lanka's Western Province. Data was analysed using regression and hierarchical regression techniques.

The study addresses a literature gap concerning the combined effects of psychological and environmental factors on public SST acceptance and offers practical guidance for creating customer-friendly self-service environments.

Keywords: Self-service technologies, Public self-service technologies, Technology anxiety, Perceived crowding

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Introduction

In recent years, the banking sector in Sri Lanka has experienced rapid growth, leading to increased competition among financial institutions. With the expansion of private, state-owned, and foreign banks, financial institutions are under pressure to identify innovative ways to attract and retain customers. Since many banking products and services are relatively similar, banks increasingly rely on technology to gain a competitive advantage. One major initiative has been the introduction of self-service technologies (SSTs), such as ATMs, cash deposit machines, and self-service kiosks, which enable customers to perform banking transactions independently.

These technologies offer several advantages, including convenience, faster service delivery, and reduced operational costs for banks. As a result, many traditional face-to-face banking interactions have gradually been replaced by technology-based services. Customers are now expected to perform various banking activities independently using these systems. Recent studies suggest that SSTs have become part of a broader omni-channel strategy, enabling customers to interact with both digital and physical service settings in an effortless way (Verhoef et al., 2015). Furthermore, the rapid digital transformation following the COVID-19 pandemic accelerated the adoption of SSTs, particularly in the banking sector, where customers are increasingly switching to contactless and automated services more and more (Alalwan et al., 2024). Despite these benefits, not all customers are willing to use SSTs as they feel uncomfortable or unsure when dealing with these technologies.

Customer resistance to the public SSTs poses actually challenging issues for banks in operation and management. If customers are reluctant, or even unwilling, to interact with self-service technologies, banks could see a rise in the cost of doing business, shortened branch hours, loss of technological investment, and challenges in maximising efficiencies. Thus, factors that deter customers from using SSTs have emerged as a major concern of researchers and banking practitioners (Blut et al., 2016).

One of the major barriers to adoption is technology anxiety. Some customers experience feelings of being nervous, confused, or even afraid when using technological systems, particularly when lacking familiarity or confidence in using them. This discomfort may reduce their intention to use SSTs even when the benefits are recognised. At the same time, the environment in which these technologies are used can also affect customer behaviour. For example, in public banking settings such as ATM booths or kiosks, customers may feel uncomfortable when others are nearby or observing them. This feeling, often referred to as perceived crowding, may increase stress and discourage the use of SSTs.

Although previous studies have discussed technology anxiety and perceived crowding separately, limited research has examined how these factors interact in public banking environments, particularly in the Sri Lankan context. The influence of a combination of psychological barriers and environmental conditions in public SST settings has received less attention than the effect of the technological characteristics of usefulness, ease of use, and

service quality (Blut et al., 2016; Gelbrich & Sattler, 2014). Moreover, empirical studies investigating the moderating effect of perceived crowding on the relationship between technology anxiety and customers' acceptance of public SSTs are scarce, particularly in developing countries like Sri Lanka. This issue is especially significant because many modern banking transactions are now conducted through public SSTs rather than direct interaction with bank employees.

Therefore, this study aims to examine the effect of technology anxiety on customers' intention to use public self-service technologies in the banking sector. In addition, the study investigates whether perceived crowding moderates this relationship. By examining both psychological and environmental factors together, this study seeks to provide a more comprehensive understanding of customers of public SSTs. The study is also aimed at offering practical recommendations for banks in creating a customer-friendly SST environment, which will reduce customer discomfort and increase customer self-service banking technology usage.

Research Objectives

This study will focus on customers' acceptance of public self-service technologies (SSTs) in the banking sector based on the research gap identified. Specifically, the research clearly aims to:

1. Investigate the effects of technological anxiety on customers' acceptance of public self-service technologies.
2. Examine how the perceived crowding moderates the relationship between technology anxiety and customers' acceptance of public self-service technologies.

Literature Review and Hypotheses Development

The term 'self-service technologies' was first used by Meuter et al. (2000) who defined it as 'technological interfaces that enable customers to produce a service independent of direct service employee involvement'. This technology transfer changes service encounters from "low-tech, high touch" to "high tech, low touch" (Bitner et al., 2000). Customers are more likely to employ SSTs when technology-based SSTs outperform traditional interpersonal, physical encounters (Bitner et al., 2002). Convenience used to refer to a customer's interaction with staff, but now days it refers to a customer's interaction with technology and the surroundings (Collier et al., 2014). Self-Service Technologies are again defined as technologies, provided by an organisation, specifically to enable customers to engage in self-service behaviours (Hilton et al., 2013). Over time, these technologies have changed how services are delivered, making customers more involved instead of depending on employees (Bitner et al., 2000). Self-service technology may be deployed without direct staff interaction (Meuter et al., 2000). As cited in Gelbrich and Sattler (2014) the context of using self-service technologies can differ significantly from each other. The term public SSTs is used with the technologies found in 'on-site' situations, which means that the consumer 'goes to the service

site and uses technology to provide service for themselves' (Dabholkar, 1994) (e.g., using automated teller machines (ATMs) and self-checkouts). In the banking sector, this can be clearly seen with the use of ATMs, cash deposit machines, and kiosks, where many transactions now happen without direct human interaction (Meuter et al., 2000). This shows how banking is slowly moving toward more digital and automated services. With the growth of technology and better digital knowledge among people, the use of SSTs has increased. Some SSTs, such as ATMs, have proven to be commonplace, and over 50% of banking transactions are completed without the assistance of counters (Meuter et al., 2000). These systems make banking easier, faster, and more convenient (Fernandes & Oliveira, 2021). However, in real situations, not all customers are comfortable using them, especially in public places. This means that customer acceptance is not only about the technology itself, but also about how people feel and the environment around them.

Technology Anxiety

One important factor that affects the use of SSTs is technology anxiety. This means the fear or discomfort people feel when using technology (Windasari, 2016). Technology anxiety is "the fear, apprehension and hope" customers feel about "general technology tools" when thinking about using SSTs (Meuter et al., 2003). This usually happens when people are not confident, not familiar with the system, or unsure whether it will work properly (Oyedele & Simpson, 2007). Many studies have found that people who feel anxious about technology are less likely to use self-service systems (Lee et al., 2013; Venkatesh et al., 2012). Even prior studies have found that technology anxiety has a detrimental influence on customer satisfaction and behavioural intention to use SSTs (Meuter et al., 2003). Consumer characteristics, including anxiety about technology, have a crucial impact on intent to use (Lee et al., 2010). According to recent studies, technology anxiety remains a significant psychological obstacle that hinders consumers' adoption of digital and self-service banking services (Rahi et al., 2021). In real life, such customers may avoid using these machines because they are afraid of making mistakes or feeling embarrassed (Blut et al., 2016; Marakarkandy et al., 2017). Low expectations for SST are ultimately the result of this fear (QianTing et al., 2021). According to the logic of the Technical Acceptance Model (TAM), technology anxiety is predicted to affect user beliefs about the use of SST (Windasari, 2016), and it has been extensively used in studies on different groups' readiness to use technologies (An et al., 2024). The deterrent effect of technology concerns over technology adoption can even be applicable to publicly available self-service technologies (SSTs) such as car rental kiosks (Zhu et al., 2007), self-scanning devices (Weijters et al., 2007), or self-checkouts (Dabholkar et al., 2003). It has been suggested that anxiety about technology reduces perceived ease of use, which affects usage intentions (Gelbrich & Sattler, 2014).

H₁: Technology anxiety has a significant negative impact on customers' acceptance of public self-service technologies in the banking sector.

Perceived Crowding

Perceived Crowding is the uncomfortable feeling people get when a place feels too crowded (Eroglu & Harrell, 1986). This can happen if the SST is publicly used by consumers because the service is used "on-site" (such as in retail stores) (Gelbrich & Sattler, 2014). In places like ATM booths or kiosks, customers may feel that others are watching them, especially if they are not confident in using the machine. An individual perceives an environment is overcrowded if the amount of people, materials, or both inside a limited space (referred to as density) limits or disrupts with an individual's behaviours or goals and in nature, the perception of overcrowding is individual, as two different shoppers in the same store may feel that the level of congestion varies according to individual-specific qualities and the constraints of the situation (Machleit et al., 2000). This can make them feel stressed or nervous, and they may avoid using SSTs (Gelbrich & Sattler, 2014). Previous research on typical shopping circumstances has revealed that consumers who are sensitive to crowds prefer to purchase impulsively (Mattila & Wirtz, 2008), purchase fewer items or leave the premises (Grossbart et al., 1990) and demonstrate decreased purchasing satisfaction (Machleit et al., 2000). Whiting (2009) revealed that in crowded retail situations, customers frequently adopt coping mechanisms such as distancing, avoidance, and escape. Recent studies also show that crowded environments and time pressure can affect how people make decisions and use technology (Ponsignon et al., 2011).

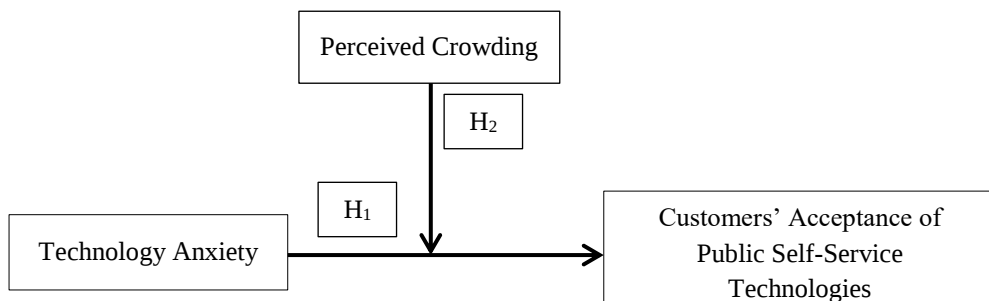
Moderating Effect of Perceived Crowding

Even though technology anxiety directly affects SST usage, the environment can make this effect stronger or weaker. For example, if a person is already anxious about technology, being in a crowded place can make them feel even more uncomfortable. At the same time, some studies suggest that when places are crowded, people may act faster without thinking too much (Gelbrich & Sattler, 2014). Because of this, perceived crowding can be seen as a factor that changes how technology anxiety affects the use of SSTs.

H₂: Perceived crowding significantly moderates the relationship between technology anxiety and customers' acceptance of public Self-Service Technologies in the banking sector.

Figure 1

Conceptual Framework of the Study



Research Method

This study employed a quantitative research approach in which data were collected through a self-administered questionnaire distributed among 250 banking customers aged 18 years and above in the Western Province of Sri Lanka. Participants were selected using a convenience sampling technique. The Western Province was chosen as this is the most commercial and highly urbanised province which has more banking institutions and more usage of self service banking technologies than other provinces of Sri Lanka. Thus, the respondents of this region were deemed more knowledgeable about public SSTs like ATM, cash deposit machines, and self-service kiosks. The measurement scales used in the study were adapted from previously validated studies.

The questionnaire was designed after a thorough literature search on the topic of self-service technologies, technology anxiety and perceived crowding. To make sure that the items of the questionnaire were clear, readable, and relevant, a pilot test was carried out with a small number of respondents before the main data collection. Some changes were made in response to feedback from the pilot study. Technology anxiety was measured using a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree' using items adapted from Meuter et al. (2003). Similarly, perceived crowding was measured using scale items adapted from Song et al. (2023). Customers' acceptance of public self-service technologies was measured using items adapted from Davis (1989) and Venkatesh et al. (2012), focusing on customers' intention and willingness to use such technologies.

The moderating effect was operationalised by creating an interaction term through multiplying the standardised values of technology anxiety and perceived crowding variables. The interaction variable was then entered into the hierarchical regression model to see if the relationship between technology anxiety and customers' acceptance of public SSTs changed when the interaction variable was added.

In addition, the measurement approach was supported by previous research conducted in the Sri Lankan context, particularly the study by Galdolage and Rasanjalee (2021), which examined customer adoption of self-service technologies in the banking sector. Ethical issues were also considered during the study. The survey was conducted on a voluntary basis, and the participants were briefed about the purpose of the study before the data collection. Furthermore, anonymity and confidentiality of the respondents were guaranteed, and the information they provided was only for academic research. Prior to hypothesis testing, the data were examined for reliability, validity, and normality to ensure their suitability for statistical analysis. Subsequently, multiple regression analysis was conducted using SPSS software to test the study hypotheses.

Although convenience sampling was appropriate for obtaining responses from active banking customers who use SSTs, this sampling technique may limit the generalisability of the findings to the broader Sri Lankan population. Therefore, the findings of the study should be interpreted within the context of the selected sample and geographical area.

Results and Discussion

Reliability Test

Prior to the data analysis, the reliability of the measurement scale was examined to ensure the consistency, stability and items are free from errors. In this study, internal consistency reliability was assessed using Cronbach's Alpha coefficient. A Cronbach's Alpha value of more than 0.7 is generally assumed to be acceptable and reliable. Accordingly, all study variables were assessed for internal consistency, and the results of the Cronbach's Alpha analysis are presented in Table 1 below.

Table 1

Reliability Testing

Reliability Statistics			
Variable	Cronbach's Alpha value standard 0.7	N of Items	Conclusion
Technology Anxiety	0.903	5	Accepted
Perceived Crowding	0.721	2	Accepted
Intention to accept public SSTs	0.723	3	Accepted

Source: Survey Data, 2022

Descriptive Statistics Analysis

Descriptive statistics were used to summarise the key characteristics of the study variables: Technology Anxiety (TA), Perceived Crowding (PC), and Intention to Use (IU). The results are presented in Table 2.

Table 2

Descriptive Statistics

		TA	PC	IU
N	Valid	232	232	232
	Missing	0	0	0
Mean		2.95	3.89	3.74
Median		3.00	4.00	4.00
Std. Deviation		0.865	0.804	0.684
Skewness		-0.062	-0.550	0.236

Std. Error of Skewness	0.160	0.160	0.160
Kurtosis	-0.946	-0.322	-0.693
Std. Error of Kurtosis	0.318	0.318	0.318

Source: Survey Data, 2022

The results show that the mean value for Technology Anxiety ($M = 2.95$, $SD = 0.865$) is slightly below the midpoint, which suggests that customers experience a moderate level of anxiety when using self-service technologies. Perceived Crowding has a relatively higher mean ($M = 3.89$, $SD = 0.804$), indicating that customers somewhat feel that banking environments are crowded when they use these technologies. The dependent variable, Intention to Use, shows a moderately high mean value ($M = 3.74$, $SD = 0.684$), which means that customers generally have a positive tendency to use public self-service technologies. In addition, the skewness and kurtosis values for all variables fall within the acceptable range of ± 1 . This suggests that the data is approximately normal and suitable for further statistical analysis.

Inferential Statistics

Impact of Technology Anxiety on SST Acceptance

To examine the impact of technology anxiety on customers' intention to use self-service technologies, a simple linear regression analysis was conducted. The regression model shows a moderate level of explanatory power, with an R value of 0.571 and an R^2 value of 0.327. This indicates that approximately 32.7% of the variation in intention to use (IU) is explained by technology anxiety. The ANOVA results indicate that the model is statistically significant ($F = 111.542$, $p < 0.001$), confirming that technology anxiety is a significant predictor of SST acceptance.

Table 3

Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.571a	0.327	0.324	0.562

a. Predictors: (Constant), TA

Source: Survey Data, 2022

Table 4*ANOVA Table*

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.265	1	35.265	111.542	0.000b
	Residual	72.717	230	0.316		
	Total	107.983	231			
a. Dependent Variable: IU						
b. Predictors: (Constant), TA						

Source: Survey Data, 2022

Table 5*Coefficients*

Coefficients a						
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.076	0.132		38.566	0.000
	TA	-0.452	0.043	-0.571	-10.561	0.000
a. Dependent Variable: IU						

Source: Survey Data, 2022

The regression results reveal that technology anxiety has a significant negative impact on customers' intention to use self-service technologies ($\beta = -0.571$, $p < 0.001$). This indicates that higher levels of technology anxiety lead to a reduction in customers' willingness to adopt SSTs in the banking sector. Therefore, technology anxiety is identified as a critical barrier to SST adoption.

Moderating Effect of Perceived Crowding

To examine the moderating effect of perceived crowding on the relationship between technology anxiety and SST acceptance, hierarchical regression analysis was conducted. The results show that the R^2 value increases from 0.328 to 0.476 after introducing the interaction term (moderator), indicating that the model explains an additional 14.8% of variance in

intention to use. The model remains statistically significant after adding the moderating variable ($F = 68.954$, $p < 0.001$), confirming the overall model fit.

Table 6

Model Adequacy

Model Summary ^c									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.573a	0.328	0.322	0.563	0.328	55.852	2	229	0.000
2	0.690b	0.476	0.469	0.498	0.148	64.288	1	228	0.000

a. Predictors: (Constant), TA, PC
b. Predictors: (Constant), TA, PC, Moderator
c. Dependent Variable: IU

Source: Survey Data, 2022

Table 7

ANOVA

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	35.403	2	17.702	55.852	0.000
	Residual	72.579	229	0.317		
	Total	107.983	231			
2	Regression	51.367	3	17.122	68.954	0.000
	Residual	56.616	228	0.248		
	Total	107.983	231			

a. Dependent Variable: IU

b. Predictors: (Constant), TA, PC

c. Predictors: (Constant), TA, PC, Moderator

Source: Survey Data, 2022

Table 8*Coefficients*

Coefficients^a								
Model	Unstandardised Coefficients		Standardised Coefficients	<i>t</i>	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
1 (Constant)	4.984	0.191		26.112	0.000			
PC	0.034	0.051	0.040	0.660	0.510	-0.214	0.044	0.036
TA	-0.465	0.047	-0.588	-9.807	0.000	-0.571	-0.544	-0.531
2 (Constant)	5.403	0.177		30.553	0.000			
PC	-0.035	0.046	-0.041	-0.757	0.450	-0.214	-0.050	-0.036
TA	-0.476	0.042	-0.602	-11.333	0.000	-0.571	-0.600	-0.543
Moderator	-0.281	0.035	-0.394	-8.018	0.000	-0.311	-0.469	-0.384

a. Dependent Variable: IU

Source: Survey Data, 2022

The results show that the interaction effect is significant ($\beta = -0.394$, $p < 0.001$), which means that perceived crowding changes the relationship between technology anxiety and the use of self-service technologies (SSTs). The negative value suggests that when customers feel the environment is more crowded, the negative effect of technology anxiety becomes stronger. In simple terms, customers who are already nervous about using technology are even less likely to use SSTs when they are in crowded places. However, perceived crowding by itself does not have a direct significant effect ($p > 0.05$), which means it mainly works as a moderating factor rather than a direct influence.

The findings also indicate that technology anxiety has a clear negative impact on the acceptance of public banking SSTs ($\beta = -0.571$, $p < 0.05$). This means that customers who feel more anxious about technology are less willing to use these systems. In addition, perceived crowding again shows a moderating effect ($\beta = -0.394$, $p < 0.05$), suggesting that the surrounding environment can influence how strongly anxiety affects customer decisions.

These results are similar to findings from earlier studies. For instance, Gelbrich and Sattler (2014) found that anxiety reduces the intention to use public SSTs. Meuter et al. (2003) highlighted that technology anxiety is one of the main barriers to using SSTs and pointed out that getting customers to try a new technology for the first time is often difficult. Likewise, Oyedele and Simpson (2007) identified technology anxiety as an important factor that influences whether customers decide to use SSTs.

Previous research also shows that environmental factors like crowding and time pressure can reduce the willingness to use these technologies (Gelbrich & Sattler, 2014). Therefore, this study adds to the existing knowledge by showing how both personal feelings (like anxiety) and environmental conditions (like crowding) work together. These findings are useful for banks, especially when introducing new technologies. If banks can reduce customer anxiety and manage crowded environments properly at the beginning, they may increase acceptance and avoid problems later if customers refuse to use the technology.

Conclusion

The main purpose of this study was to examine the effect of technology anxiety on customers' acceptance of public self-service technologies (SSTs) in the banking sector and also to investigate the moderating impact of perceived crowding in this relationship. Overall, the findings are consistent with previous empirical studies and provide important insights into customer behavior in public SST environment. More significantly, the study also points to the significance of not only psychological and environmental conditions surrounding the service encounter, but also technological factors.

The first objective was to examine the effect of technology anxiety on customers' acceptance of public SSTs. The findings revealed that technology anxiety has a significant negative impact on SST acceptance. This indicates that customers who experience higher levels of anxiety or discomfort using technology are less likely to adopt self-service banking technologies. The regression model explained approximately 32.7% of the variation in SST acceptance, suggesting that technology anxiety is an important determinant of customer adoption behavior in public banking SST environments. The present finding complements the previous literature about technology acceptance by highlighting the importance of emotional and psychological inhibitors to customers' decision in a technology-based service encounter.

The second objective was to examine whether perceived crowding moderates the relationship between technology anxiety and SST acceptance. The results demonstrated that the inclusion of the interaction variable improved the power of the model, with an increase of 14.8% in the R^2 value. Furthermore, the moderating effect was also significant ($\beta = -0.394$), indicating that perceived crowding strengthens the negative effect of technology anxiety on customers' intention to use SSTs. The findings suggest that customers who already feel anxious about technology become even less willing to use SSTs when they perceive the environment to be crowded or socially uncomfortable. Theoretically the study extends the understanding of SST acceptance beyond individual technological perceptions and adds the environmental influences to the SST in public contexts.

The results also suggest that future studies would benefit from a deeper exploration of other psychological, social and contextual factors that could affect SST acceptance behaviour in various technological and service contexts. Future research work could be directed at studying other banking technologies like mobile banking and internet banking as well as other demographic and behavioural factors to get a better understanding of customer technology adoption behaviour.

Implications

The findings of this study provide important implications for retail banks in Sri Lanka that use public self-service technologies such as automated teller machines (ATMs), cash deposit machines (CDMs), cheque deposit machines, and self-service kiosks. The results indicate that technology anxiety significantly influences customers' acceptance of these technologies. In addition, perceived crowding strengthens the negative effect of technology anxiety on customers' intention to use public SSTs.

This study mainly emphasises the early stage of adoption, where customers are using a new self-service technology for the first time in a public setting. Based on the findings, it is important for banks to focus on improving customers' comfort and confidence at this early stage, before fully implementing the technology. If customers reject the system later, it can lead to unnecessary costs for the bank.

The results suggest that managers should pay close attention to factors contributing to technology anxiety develops among customers and find ways to reduce it. For example, banks may provide simple training or guidance for first-time users, and make sure staff are available to assist customers when needed. It is also important to highlight user-friendly features that make the technology easy to use, so customers feel more confident.

At the same time, banks should also consider environmental factors such as perceived crowding in public banking spaces. Customers who feel socially uncomfortable or believe they are being observed by others may avoid using SSTs. To address this issue, banks may improve the physical design of SST environments by increasing more privacy around ATM areas, controlling congestion within kiosks, and implementing more efficient queue management systems. By adopting these measures, banks may enhance the overall customer experience and encourage greater acceptance and usage of public self-service technologies.

Limitations and Suggestions for Future Researchers

Based on the findings of this study, several limitations can be identified, which also provide directions for future research. This study primarily examined the effect of technology anxiety on the acceptance of public self-service technologies (SSTs) in the banking sector, together with the moderating role of perceived crowding.

One of the main limitations of this study is that it focused only on the banking sector and specially on public SSTs such as ATMs, CDMs, and cheque deposit machines. Other forms of technology-based banking services, such as internet banking or mobile banking, were not considered despite their widespread usage. Also, all public SSTs were examined collectively when gathering responses. As a result, some respondents may have responded based on the one system with which they were most familiar. Therefore, future studies may focus on a specific type of SST individually.

Another limitation is that some customers may try using these machines once but may not continue using them. This could be due to simple reasons like habit, lack of interest, or preferring to deal with bank staff instead.

In addition, this study is limited to technology anxiety as the main factor. But in reality, there are many other things that can influence customer behaviour, such as age, education, social influence, or even personal attitudes toward technology. Since these factors were not included in the present study, future researchers may incorporate them to develop a more comprehensive understanding of customer acceptance behaviour.

Finally, this study was limited to the Sri Lankan context, particularly the Western Province, and the sample size was relatively limited. Consequently, the findings may not fully represent all banking customers in Sri Lanka. Future studies could improve the generalisability of the findings by including respondents from different geographical regions and using larger sample sizes.

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