



# THE INFLUENCE OF SELF-SERVICE TECHNOLOGY ON CUSTOMER SATISFACTION: AN EMPIRICAL ANALYSIS OF RESTAURANTS IN DAVAO REGION

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## ABSTRACT

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*This research explored the impact of self-service technology (SST) on customer satisfaction in chosen fast-food chains in Davao Region, Philippines. The study sought to profile respondents by age, gender; to measure their perceptions of ease of use, speed of ordering, and perceived security risk; and to investigate their relationship with overall customer satisfaction. Using a quantitative descriptive-correlational design, data were collected through a structured questionnaire administered to 250 customers with prior kiosk experience. Frequency and percentage distribution described demographics, weighted means assessed perception levels, and Pearson correlation, t-test, and one-way ANOVA tested relationships and group differences.*

*Results showed that respondents were predominantly young (18–25 years, 75.1%) and female (59%). All SST factors—ease of use ( $M = 4.09$ ), speed of ordering ( $M = 4.06$ ), and perceived security risk ( $M = 3.95$ )—as well as customer satisfaction ( $M = 4.12$ ) were rated high. Correlation analysis confirmed significant positive relationships between all SST factors and satisfaction, with perceived security emerging as the strongest predictor ( $r = .68, p < .001$ ). Gender differences were not significant, while age differences were significant ( $p = .008$ ), indicating that satisfaction varies across age groups.*

*The research highlights the need to develop kiosks that are user-friendly, efficient, and visibly secure to uphold customer trust. It is recommended that fast-food operators extend interface simplicity, ensure strong security features, and offer age-inclusive support to enhance satisfaction and loyalty.*

**KEY WORDS:** *self-service technology, Customer satisfaction, fast-food, Davao Region,*

## 1.0 INTRODUCTION

In recent years, the food service industry has undergone a remarkable transformation through the adoption of innovative technologies designed to improve efficiency and customer experience. Among these innovations, Self-Ordering Kiosks (SOKs) have gained widespread attention for their potential to enhance financial performance, increase customer loyalty, and generate favorable employee feedback (Ottenbacher & Gnoth, 2005). The 2019 National Restaurant Association State of the Industry Report revealed that 41% of quick-service operators intended to invest in SOKs and other digital systems to meet evolving customer expectations (Kelso, 2019). Similarly, a Tillster (2020) survey indicated that 65% of customers were more likely to visit restaurants with self-service kiosks, reflecting the rising demand for convenience and faster service (Neiman, 2019).

Self-Service Technologies (SSTs) are technical interfaces that allow customers to access services without the assistance of service employees (Meuter et al., 2005). Examples include ATMs, self-checkout counters, e-commerce platforms, and self-ordering kiosks (Lee, 2015). With the Fourth Industrial Revolution (IR 4.0)—characterized by automation, digitization, and smart systems—SSTs have become essential tools in service delivery, offering businesses improved

efficiency and customers enhanced control over their service experiences (Geissbauer et al., 2016; Rajput & Singh, 2018).

Globally, fast-food chains such as McDonald's have pioneered the use of self-service systems, with some outlets even adopting fully cashless models (Venables, 2022). In Southeast Asia, McDonald's and Golden Village Cinemas in Singapore quickly gained customer acceptance of SOKs (Times, 2018). In the Philippines, Jollibee has deployed nearly 100 kiosks across 37 branches, integrating loyalty points and cashless payment features (BusinessMirror, 2019). Similarly, ANSI Information Systems introduced the country's first self-order kiosks to streamline order processing and improve customer satisfaction (Manila Standard, 2019). Moreover, McDonald's Philippines launched its NxtGen store concept, which combined kiosks with multi-point ordering to balance digital efficiency and human interaction (Tayao-Juego, 2018).

Despite their benefits, challenges remain. Studies show that some customers—particularly older ones—hesitate to use kiosks due to lack of familiarity with technology, preference for face-to-face interactions, or concerns about security (Rastegar, 2018; White et al., 2012). Designing user-friendly systems and positioning staff near kiosks are recommended strategies to address these barriers (Lawton, 2022). In addition, restaurants

in Northern Philippines report difficulties related to pricing, staffing, and service reliability, requiring thoughtful adaptation of kiosk technology (Dingil et al., 2023).

Nevertheless, kiosk machines present a promising opportunity for the Philippine food service sector. Martinez (2023) emphasized that kiosks not only improve operational efficiency but also provide valuable data for customer behavior insights. As the quick-service restaurant (QSR) market continues to expand—holding the largest share in 2022 and expected to grow at a CAGR of 15.78% (Mordor Intelligence, 2022)—the role of self-service technology in shaping customer satisfaction becomes even more critical.

### 1.1 Statement of the Problem

The rapid advancement and adoption of self-service technologies (SST), particularly self-ordering kiosks (SOKs), has transformed the foodservice industry worldwide. These technologies are intended to streamline operations, enhance customer convenience, and improve overall satisfaction. While many global studies have explored the impact of SSTs, there is limited empirical research on their specific effects within the context of fast-food establishments in Davao City, where consumer behaviors and preferences may differ.

This study therefore seeks to bridge this gap by examining the influence of self-service technology on customer satisfaction among fast-food customers in Davao City. In particular, the study aims to determine how customer profiles and key attributes of self-service systems affect satisfaction levels.

Specifically, the study seeks to answer the following questions:

1. What are the demographic profiles of the respondents in terms of:
  - 1.1 Age
  - 1.2 Gender
2. What is the impact of self-service technology on customer satisfaction based on the following factors?
  - 2.1 Ease of Use
  - 2.2 Speed of Ordering
  - 2.3 Perceived Security Risk
3. What is the relationship between the use of self-service kiosks and overall customer satisfaction in fast-food establishments in Davao City?
4. Do demographic variables (age and gender) significantly influence customer satisfaction with self-service technology in fast-food establishments?

### 1.2 Objectives of the Study

This study aims to analyze the influence of self-service technology on customer satisfaction in fast-food establishments in Davao City. It seeks to profile respondents in terms of age, gender, and level of education, while also assessing how factors such as ease of use, speed of ordering, and perceived security risk affect their satisfaction with self-service kiosks. Moreover, the study examines the relationship between the use of self-service kiosks and overall customer satisfaction, as well as the extent to which demographic variables influence customer experiences. By addressing these objectives, the research intends to provide meaningful insights that can guide fast-food establishments in improving their service delivery and customer engagement through self-service technologies.

**1.3 Significance of the Study** This study is significant as it provides valuable insights into how self-service technologies, particularly self-ordering kiosks, shape customer satisfaction in the fast-food industry. By focusing on fast-food establishments in Davao Region, the research offers a localized understanding of customer experiences and preferences, which may differ from those in other contexts.

For fast-food operators, the findings will help identify which aspects of self-service technology, ease of use, speed of ordering, or perceived security risk, most strongly influence satisfaction. This knowledge can guide management in refining kiosk designs, improving service processes, and addressing customer concerns to enhance loyalty and competitiveness.

For customers, the study highlights factors that contribute to better service experiences, ensuring that their voices and preferences are considered in the continued development of technology-driven dining solutions.

For technology providers and developers, the research underscores the importance of creating user-friendly, secure, and efficient kiosk systems that align with the needs of diverse customer groups, including different age, gender, and educational profiles.

For the academic community and future researchers, the study adds to the growing body of literature on self-service technologies in foodservice, providing empirical evidence from the Philippine setting. It may serve as a foundation for further research on technology adoption, customer behavior, and service quality in other industries.

Finally, for policy makers and industry leaders, the study offers insights into balancing digital innovation with customer inclusivity, ensuring that technological advancement does not compromise service accessibility, especially for less tech-savvy demographics.

### 1.4 Scope and Limitation of the Study

This study is focused on examining the influence of self-service technology, particularly self-ordering kiosks (SOKs), on customer satisfaction in selected fast-food establishments within Davao Region. It evaluates customer satisfaction in terms of ease of use, speed of ordering, and perceived security risk. Demographic characteristics such as age and gender are also considered to determine whether these factors influence satisfaction with self-service kiosks.

The study is subject to several limitations. First, it is geographically limited to fast-food establishments in Davao Region, and the findings may not fully represent other regions. Second, it is confined only to self-ordering kiosks and does not include other forms of self-service technologies such as mobile ordering applications, online delivery platforms, or drive-thru systems. Third, the data is collected through self-administered surveys, which may be influenced by the respondents' honesty, recall accuracy, and interpretation of survey questions. Lastly, the research is cross-sectional in design, measuring perceptions at a single point in time, and therefore does not capture long-term changes in satisfaction after repeated interactions with kiosk systems.

Despite these limitations, the study provides important insights into the role of self-service technology in shaping customer satisfaction in the fast-food industry and offers practical recommendations for improving technology-driven service delivery.

### 1.5 Definition of terms

**Self-Service Technology (SST)** – Technology-based service interfaces that allow customers to perform transactions without direct employee assistance, such as self-ordering kiosks in fast-food restaurants.

**Self-Ordering Kiosk (SOK)** – A digital ordering terminal that enables customers to browse menus, customize orders, and make payments independently.

**Ease of Use** – The degree to which the kiosk's interface is simple, user-friendly, and requires minimal effort to operate.

**Speed of Ordering** – The efficiency of the kiosk in processing transactions and reducing waiting time for customers.

**Perceived Security Risk** – The level of concern customers feel regarding privacy, payment safety, and data protection when using kiosks.

**Customer Satisfaction** – The overall positive evaluation of the service experience, including convenience, reliability, and fulfillment of customer expectations when using SSTs.

**Frequency and Percentage Distribution** – A statistical method used to describe and summarize the demographic profile of respondents by showing the number and proportion of responses in each category.

**Weighted Mean** – A statistical measure used to determine the average rating of survey items, accounting for the relative importance of each response.

**Pearson Product-Moment Correlation (r)** – A statistical test used to determine the strength and direction of the relationship between SST factors (ease of use, speed, security) and customer satisfaction.

**Independent Samples t-Test** – A statistical test used to compare the mean satisfaction scores between two groups (e.g., male and female respondents) to determine if differences are significant.

**One-Way Analysis of Variance (ANOVA)** – A statistical method used to assess whether there are significant differences in customer satisfaction across multiple age groups.

## 2.0 REVIEW OF RELATED LITERATURE AND STUDIES

### Ease of Use of Self-Service Technology

Ease of use has consistently been identified as one of the strongest predictors of satisfaction in technology adoption. Dabholkar and Bagozzi (2002) demonstrated that perceived ease of use enhances satisfaction and likelihood of reuse. In support of this, Lee (2015) emphasized that intuitive and user-friendly kiosks encourage repeat visits, reinforcing the importance of interface simplicity in customer acceptance. Curran and Meuter (2007) also found that user-friendliness influences customer intention to continue using SSTs, particularly in banking and retail contexts, suggesting cross-industry relevance.

Further evidence shows that ease of use is especially crucial among customers with low technological readiness. Weijters et al. (2007) noted that adoption is more likely when kiosks are perceived as simple and non-intimidating. Shin and Perdue (2019) similarly found that ease of navigation in hotel check-in

kiosks positively influenced satisfaction, demonstrating that design quality directly impacts perceived service quality.

Within the Philippine context, Dela Cruz (2019) reported that café and restaurant customers ranked ease of use as the most critical factor in evaluating digital ordering systems. Martinez (2023) also emphasized that simplified interfaces increase adoption in QSRs, while Garcia (2022) confirmed that Filipino customers strongly associate user-friendly kiosks with convenience and satisfaction during peak hours.

### Speed of Ordering

Efficiency is another major determinant of customer satisfaction. Collier et al. (2014) showed that kiosks significantly reduce waiting time, making them particularly valuable in high-volume QSRs. Supporting this, Tillster's (2020) survey reported that 65% of global customers preferred kiosks primarily for faster service. Cho and Fiorito (2010) likewise found that reduced waiting time directly influenced repeat purchase behavior in retail settings using self-service technologies.

Additional studies reinforce the role of speed in shaping loyalty. Back, Choe, and Ok (2018) demonstrated that shorter service times increase customer retention in self-service environments. Oh, Jeong, and Baloglu (2019) similarly found that speed was among the most influential variables in guest satisfaction with hotel kiosk check-in systems, suggesting cross-industry applicability.

In the Philippines, Perez (2021) observed that Jollibee's NxtGen customers in Quezon City strongly associated kiosks with efficiency, especially during peak hours. Garcia (2022) further revealed that speed of transaction was the most powerful determinant of satisfaction among fast-food customers in Metro Manila. Complementing these findings, Reyes and Santos (2020) concluded that "fast ordering" remains the primary motivation for Filipino consumers to adopt kiosks in urban QSRs.

### Perceived Security Risk

Concerns about data privacy and security also shape kiosk adoption. Lin and Hsieh (2011) found that perceived risk undermines trust, reducing satisfaction in self-service encounters. In agreement, Rastegar (2018) noted that some customers avoid kiosks entirely due to fears of transaction errors or compromised payment security.

Scholars recommend trust-building measures to mitigate these concerns. Wang and Harris (2012) argued that visible security certifications and encryption indicators help reassure customers. Lee and Yang (2013) confirmed that strong perceptions of security influence long-term kiosk use, while Crespo et al. (2009) stressed that risks can be minimized when businesses maintain transparent communication and a trusted brand reputation. Cho and Fiorito (2010) further emphasized that payment safety enhances trust, which directly boosts satisfaction.

In the Philippine setting, Martinez (2023) revealed that customers were more satisfied with kiosks when loyalty systems and cashless payments were supported by clear privacy policies. Reyes and Santos (2020) observed that Metro Manila consumers were hesitant to use kiosks without visible security

features, while Garcia (2022) highlighted that receipt confirmations and transaction visibility reduced fears of fraud in local QSRs.

### Relationship of SST Use and Overall Satisfaction

The integration of self-service kiosks has been shown to enhance overall customer satisfaction by improving reliability and offering customization options. Ottenbacher and Gnath (2005) argued that kiosks empower customers by providing control and autonomy, while Collier and Kimes (2013) reported that kiosks minimize service inconsistencies, making them appealing to repeat users.

Expanding on this, Zhang et al. (2017) demonstrated that customers perceive higher service quality when kiosks complement rather than replace staff, emphasizing the importance of balancing human assistance with technology. Dabholkar and Bagozzi (2002) similarly found that kiosks generate satisfaction when convenience and reliability are present. Kaushik and Rahman (2017) concluded that technology-enabled service encounters raise both satisfaction and perceived service quality, while Shin and Perdue (2019) discovered that kiosk adoption in hotels enhanced not only satisfaction but also perceptions of brand innovativeness.

In the Philippines, Perez (2021) confirmed that kiosks significantly increased overall satisfaction among Filipino QSR customers. Garcia (2022) reinforced this by linking satisfaction to transaction speed, ease of use, and reliability. Reyes and Santos (2020) added that kiosk adoption is associated with modernization and efficiency, which contribute to greater customer loyalty.

### Influence of Demographics on Satisfaction

Demographic factors play a moderating role in kiosk satisfaction. White et al. (2012) found that younger customers reported higher satisfaction, whereas older customers required more staff assistance, highlighting generational differences in technology readiness. Similarly, Dingil et al. (2023) showed that kiosk adoption in the Northern Philippines varied by education level, with lower-educated groups exhibiting greater hesitation.

Gender also appears to shape satisfaction. Hsu and Wu (2019) indicated that men valued speed and efficiency more positively, while women were more concerned with accuracy and security. Weijters et al. (2007) also observed that age and education significantly influenced perceptions of kiosk ease of use.

Socioeconomic status is another factor. Collier et al. (2014) reported that higher-income, well-educated customers rated kiosks more favorably, likely due to greater exposure to technology. Shin and Perdue (2019) similarly noted that Millennials and Gen Z associated kiosks with brand innovativeness, reporting higher satisfaction compared to older cohorts.

In the Philippine context, Garcia (2022) found that customers with higher education levels had more favorable responses to kiosks. Supporting this, Reyes and Santos (2020) observed that younger Filipino consumers were more willing to experiment with kiosk systems, while older users preferred cashiers for reasons of convenience and familiarity.

### Synthesis

The reviewed literature confirms that self-service kiosks significantly influence customer satisfaction across multiple dimensions. Ease of use and speed of ordering consistently emerge as strong drivers of satisfaction, while perceived security risks remain barriers to adoption. Demographic characteristics such as age, gender, education, and income shape customer experiences and moderate the effects of kiosks on satisfaction.

International studies highlight the global importance of interface design, efficiency, and trust-building in encouraging SST adoption. Meanwhile, local research underscores unique Filipino perspectives, such as the continued preference for cashier interaction among older demographics and the value placed on security features. Despite widespread global adoption, empirical studies in the Philippine context remain limited, particularly in Davao Region.

This gap reinforces the relevance of the present study, which examines how kiosks affect satisfaction in fast-food establishments in Davao City. By analyzing ease of use, speed, perceived risk, and demographic influences, this research aims to extend existing knowledge and provide evidence-based insights for both industry practice and academic discourse.

### 3.0 RESEARCH METHODOLOGY

This study employed a quantitative descriptive–correlational design to determine the influence of self-service technology (SST) on customer satisfaction in selected fast-food establishments in the Davao Region. The descriptive component profiled respondents and assessed their perceptions of ease of use, speed of ordering, and perceived security risk, while the correlational component examined the relationships of these factors to overall customer satisfaction.

The research was conducted in fast-food establishments utilizing self-service kiosks, chosen for their accessibility and diverse clientele. Respondents were customers with prior kiosk experience, selected through purposive sampling to ensure relevance. Using Slovin's formula with a 5% margin of error, a sample of 250 customers was determined to represent the target population.

Data were collected through a structured survey questionnaire consisting of three sections: (1) demographic profile (age and gender), (2) perceptions of SSTs (ease of use, speed, security risk), and (3) customer satisfaction. Survey items were adapted from validated instruments and pilot-tested with 30 respondents to ensure clarity and reliability, with Cronbach's alpha coefficients meeting the  $\geq 0.70$  standard.

Upon securing management approval, questionnaires were distributed immediately after kiosk transactions. Respondents were briefed on the study's purpose, assured of confidentiality, and asked for informed consent. Completed forms were checked for accuracy and encoded for analysis.

For data analysis, frequency and percentage distribution described the demographic profile, while weighted mean measured perception levels. Pearson product–moment correlation assessed relationships between SST factors and satisfaction. Independent samples t-test and one-way ANOVA

tested differences across gender and age groups, and multiple regression analysis identified predictors of customer satisfaction. All ethical protocols were observed, ensuring voluntary participation, informed consent, and strict confidentiality.

**4.0 FINDINGS AND DISCUSSION**

**Respondents' Profile**

The respondents were categorized by age and gender. As shown in Table 1, the majority were 18–25 years old (75.1%), followed by 26–35 years old (22.0%). Only a small proportion were older

than 35. In terms of gender, 59% were female and 41% were male. This indicates that the sample was dominated by young and female customers.

This demographic pattern is consistent with Hsu and Wu (2019), who noted that younger consumers—particularly Millennials and Gen Z—are more inclined to adopt self-service technologies due to greater digital literacy. Similarly, White et al. (2012) highlighted that younger and more educated individuals demonstrate higher levels of satisfaction with SST use compared to older cohorts.

**Table 1**  
**Demographic Profile of Respondents (N = 250)**

Variable	Frequency (f)	Percentage (%)
Age		
18–25 years old	188	75.1
26–35 years old	55	22.0
36 and above	7	2.9
Gender		
Male	103	41.0
Female	147	59.0

Note. Values are based on self-reported demographic characteristics.

Table 2 indicates that respondents generally perceive SSTs as **easy to use, efficient, and secure**, contributing positively to their satisfaction. Notably, security risks were still rated “High,” implying that while respondents trust the system, some

underlying concerns about data safety remain. The highest mean for **Customer Satisfaction** confirms that SST factors overall support positive customer experiences

**Table 2**  
**Weighted Mean Scores of Self-Service Technology Factors and Customer Satisfaction**

Dimension	Mean	SD	Verbal Interpretation
Ease of Use	4.09	0.55	High
Speed of Ordering	4.06	0.58	High
Perceived Security Risk	3.95	0.62	High
Customer Satisfaction	4.12	0.53	High

Note. Scale: 1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High.

As showed in Table 3 all factors showed moderate to strong correlations with satisfaction, emphasizing that **ease of use, speed, and security are critical determinants** of customer satisfaction with SSTs. Among these, **security had the**

**strongest correlation (r = .68)**, highlighting that trust and safety are slightly more influential in shaping satisfaction than speed or ease alone

**Table 3**  
**Correlation Between SST Factors and Customer Satisfaction**

Variables	r	p-value	Interpretation
Ease of Use & Satisfaction	.66	< .001	Significant
Speed & Satisfaction	.66	< .001	Significant
Security & Satisfaction	.68	< .001	Significant

Note. Pearson Product-Moment Correlation was used. All correlations are significant at p < .05.

Table 4 display that the independent samples t-test showed **no significant difference** in customer satisfaction between males (M = 4.10) and females (M = 4.15), **t = 1.10, p = .272**. This suggests that **gender does not significantly influence customer satisfaction levels** in relation to SST use. Both male

and female respondents reported similarly high levels of satisfaction, which is consistent with global findings where gender differences in technology acceptance are becoming less pronounced

**Table 4**  
**t-Test Results of Customer Satisfaction by Gender**

Gender	N	Mean	SD	t	p-value	Interpretation
Male	103	4.10	0.57	1.10	.272	Not Significant
Female	147	4.15	0.52			

Note. Independent samples t-test was used; p < .05 is significant.

The one-way ANOVA in table 5 revealed a **significant difference in customer satisfaction across age groups** ( $F = 4.06, p = .008$ ). This indicates that **age influences satisfaction with SSTs**. Younger respondents (18–25) likely rated satisfaction higher due to their comfort with technology, while

older respondents may have experienced challenges in adapting to self-service systems. This confirms prior studies (e.g., Dingil et al., 2023) showing that **age moderates SST adoption and satisfaction**, with older groups being more cautious and less satisfied

**Table 5**  
**ANOVA Results of Customer Satisfaction by Age**

Source	SS	df	MS	F	p-value	Interpretation
Between Groups	2.00	2	1.00	4.06	.008	Significant
Within Groups	61.50	247	0.25			
Total	63.50	249				

Note. One-way ANOVA was used;  $p < .05$  is significant.

## 5.0 CONCLUSION AND RECOMMENDATIONS

Based on the findings, the following conclusions are drawn: Self-service technologies in fast-food establishments are generally perceived positively by customers, particularly in terms of ease of use and speed of ordering. These results confirm previous studies (Dabholkar & Bagozzi, 2002; Collier et al., 2014; Baek et al., 2018) highlighting the importance of usability and efficiency in shaping satisfaction.

Perceived security emerged as the most critical factor influencing satisfaction, consistent with findings by Lin and Hsieh (2011) and Shin and Perdue (2019) that trust and privacy safeguards enhance customer acceptance of SSTs.

Demographics, particularly age, moderate the level of satisfaction. While younger customers are the primary users of kiosks, older respondents reported higher satisfaction once they engaged with the technology. This supports Dingil et al. (2023) and Weijters et al. (2007), who found that positive experiences can improve acceptance among less tech-savvy consumers.

Gender was not a significant factor in shaping SST satisfaction, suggesting that kiosk adoption appeals equally across male and female customers.

### Recommendations

In light of the findings and conclusions, the following recommendations are offered:

**For Fast-Food Establishments** – Continue to enhance kiosk design to maximize ease of use and efficiency. Security features such as receipt confirmations, visible encryption, and clear privacy policies should be prioritized, as security was the strongest predictor of satisfaction.

**For Management and Policy Makers** - Invest in customer education and awareness campaigns to reassure customers about kiosk security and functionality, particularly targeting older customers who may be less confident with digital transactions.

**For Future Researchers** – Expand the study by including other cities in the Philippines or comparing fast-food establishments with other service sectors (e.g., hotels, banks, or retail) to further validate the role of SSTs in shaping customer satisfaction.

**For Academic Institutions** – Integrate findings into hospitality and business curricula to prepare future managers for technology-driven service operations, emphasizing the balance between efficiency, usability, and customer trust.

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