

**Intention of Using Self-Service Kiosk in Fast Food Restaurants amongst Malaysian University Youth:  
Evaluating the Role of Perceived Usefulness, Ease of Use, Enjoyment and Safety Risk**

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**Abstract:** Self-Service Kiosks (SSKs) are a common self-service technology, consisting of a large screen mounted on a pillar from which customers place their food orders. It is a contactless service that was rapidly adopted in fast food operations during the COVID-19 pandemic as an effort to minimize the risk of transmission and was generally well-received by the younger tech-savvy population. This study aims to explore fast food SSK usage intention amongst the university student population using the Technology Acceptance Model with the injection of Perceived Safety Risk as a moderating variable. A total of 400 responses were collected using online questionnaires. Data were analyzed using the SEM-PLS method. Perceived usefulness (PU), perceived ease of use (PEOU) and perceived enjoyment (PE) did affect intention to use the self-service kiosk. However, Perceived Safety Risk did not have a significant moderating effect on intention to use. While perceived safety risk may not deter university youths from using self-service kiosks, continuous practice of cleaning and sanitizing touchscreens by the fast-food management should be practiced even in the post-pandemic stage of COVID-19. Periodic software and hardware upgrades will make the self-service kiosk more user-friendly and improve the streamlined services at fast food outlets.

**Keywords:** *Perceived Usefulness, Perceived Ease of Use, Perceived Enjoyment, Perceived Safety Risk, Intention to Use*

## 1. Introduction

Consumer behavior has been influenced by new technology because of its rapid development, and it has played an important role in the food and beverage industry (Zurena et al., 2015). Self-service technologies (SSTs) are a type of technology that allows customers to use services without having to interact with staff (Iqbal et al., 2018; Martins et al., 2014; Jeon et al., 2020). Self-service technologies such as touch-screen menu displays assist customers in placing orders and making payments, and most SST systems are located on pillars or at tables (Kim & Csudh, 2012). Self-service kiosks (SSKs) are one of the most common types of SSTs, with a large screen on a pillar as a point where customers place their food orders (Han et al., 2020). Customers can use the kiosks to place orders quickly and easily and receive assistance from staff if necessary (Kim & Csudh, 2012). Furthermore, SSKs are useful to restaurateurs because they reduce labor costs in restaurants (Cross, 2017; Kashif et al., 2015; Baba, Aslinda & Hafiz Hanafiah, 2020).

SSKs are also gradually becoming more prevalent in the fast-food industry in Malaysia. The first fast food establishment to introduce SSKs was McDonald's in Klang Valley in 2017 (Yang & Gheeta, 2019). McDonald's had a competitive advantage over its rivals at the time thanks to the new technology (Yang & Gheeta, 2019). After waiting two years, KFC added SSKs to their menu in Klang Valley locations in 2019 (Qishin Tariq, 2019). In addition to the fast-food industry, SSKs are used in convenience stores for any worker assistance (Chin et al., 2018). It is specifically the Irispay E-Concept Store, where customers may choose their preferred food from a variety of touchscreen vending machines and then pay using the Irispay application (Chin et al., 2018).

University youths are often recognized as one of the major customers of the fast-food industry (Garg 2014, Bakar et al, 2017). As the fast-food business continues to modernize through the utilization of self-ordering kiosks, it has become accustomed to the younger generation since they have been growing up within a technologically prevalent environment (Nakagawa & Yellowlees, 2020; Wei et al., 2021). However, several scholars note that a digital divide with regard to technology literacy may persist especially between youths from urban and rural backgrounds (Spariosu, 2018; Kamarudin et al., 2019; Kalonde, 2017).

Restaurant owners must comprehend their customers' acceptance of SSKs, given their rise. Researchers have frequently utilized the Technology Acceptance Model (TAM) to express their desire to use a specific technology (Rastegar et al., 2018; Ujang et al., 2016; Yang & Gheeta, 2019). Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), the two key variables in this model that represent an individual's acceptance of information technologies, were developed by Davis (1989). Therefore, TAM can address the issue of how customers adopt and use new technologies (Vanan & Subramani, 2015). This TAM has been utilized extensively in research including self-service kiosks at fast food restaurants (Yang & Gheeta, 2019). According to Hor et al. (2020), TAM is a well-liked methodology for examining technological acceptance. They also utilized it to determine how SSTs were being adopted in terms of consumer purchasing patterns. Studies have already been conducted that contrasted customers' and service providers' perspectives through the attributes (Park et al., 2021). This led to the use of two different sets of questionnaires from patrons and restaurant managers. The previous investigations found no appreciable variations between male and female behavior regarding technology uptake (Dabholkar et al., 2003; Kincaid & Baloglu, 2005). Kim and Csudh (2012) used the implication to measure how the gender gap is connected to the customers' prior experience, preparation, and likelihood of using kiosks.

Meanwhile, perceived safety risk has often been explored as a moderator towards technological usage intention (Sharma & Sharma, 2019) especially during safety and security crisis (Mohd Ayob & Masron, 2014; Som et al., 2015; Tan et al., 2017). Although the COVID-19 outbreak indirectly encourage the growth of contactless services in fast-food industry (Wang et al., 2021), customers safety concerns would continue to remain. The hygiene of the self-service kiosk's touchscreen is often questioned since traces of fingerprints may be a catalyst for transmitting harmful microorganisms and would require a strict cleaning SOP to minimize the potential harm (Baba et al., 2023). Despite, the world's transition into the endemic stage of COVID-19, sanitation practices are still being practiced within the fast-food business. While university students may show favorable acceptance patterns towards the wide usage of SSK at fast food restaurants, little is understood about the role of perceived safety risk which may have the potential to alter their usage intention patterns.

Having highlighted the key issues and gaps, this paper aims to explore fast food SSK usage intention amongst the university student population using the Technology Acceptance Model and any potential deterrence from Perceived Safety Risk.

## **2. Literature Review**

### **Technology Acceptance Model (TAM)**

The original technology Acceptance Model (TAM) has been used since 1989 (Rastegar et al., 2018). It is a theory of information systems that predicts customer acceptance of new technology (Ujang et al., 2016). This model is based on a psychological theory known as the theory of reasoned action (TRA), which examines behavior (King & He, 2006). In short, it is a well-known model that is used in the research framework of any technology acceptance study (Rastegar et al., 2018). As a result, many researchers have used TAM to assess the level of acceptance of technology (Ujang et al., 2016; Rastegar et al., 2018; Yang & Gheeta, 2019). The original TAM comprises two factors are perceived ease of use (PEOU) and perceived usefulness (PU) (Ujang et al., 2016). Later on, perceived enjoyment (PE) was added after PEOU and PU because they discovered that it could also influence technology acceptance (Lee et al., 2006).

### **Perceived Usefulness (PU)**

One of the important factors in TAM is perceived usefulness (PU). It is a variable in which people can improve their productivity, performance, and effectiveness by utilising a specific technology (Davis, 1989; Jarina et al., 2019). Meanwhile, Wang (2012) stated that perceived convenience influences PU, thus customer satisfaction as well as customer intention to use (Yang & Gheeta, 2019). Perceived usefulness (PU) is important because it describes how technology can help customers save time and effort (Yang & Gheeta, 2019). Cho and Sagynov (2015) discovered a significant relationship between PU and consumer behaviour in self-service technology, as well as the potential for adoption in apparel retail settings (Jarina et al., 2019). Furthermore, Lee et al. (2012) demonstrated a positive influence on passengers' intentions to use the Self-service Check-In machines at Singapore Changi Airport. Lu et al. (2009) investigated SSKs in airports, which positively influenced PU and customer attitudes towards it. In airport kiosks, Taufik and Hanafiah (2019) discovered a positive relationship between PU and customer attitude.

### **Perceived Ease of Use (PEOU)**

Perceived Ease of Use (PEOU) is defined as the degree to which a user believes that using a particular system or technology will be painless (Ujang et al., 2016). According to the study of Aboelmaged and Gebba (2013), consumers are focused on the effort when using technology for payments and the complexity level of new technology. As a result, PEOU has a significant impact on people's intentions to use new technology because it is simple to use and will be widely used in their daily lives (Gunawardana, Kulathunga & Perera, 2015; Yang & Gheeta, 2019). A previous study found that PEOU has a positive relationship with technology spending behavior (Hor et al., 2020). This is because the perceived ease of using SSTs has shortened the time used for payments, and the convenience has increased spending behavior (Hor et al., 2020). Meanwhile, PEOU had a significant impact on the customer's intention to use technology (Kattara & Said, 2014; Yang & Gheeta, 2019). The reason for this is that consumers are more comfortable with new technology and can learn how to use it in a short period (Yang & Gheeta, 2019). Tarhini et al. (2016) discovered that a person's demographic profile can influence their use of SST. Some elderly people and those with limited education may struggle to use SSTs technology without assistance (Hor et al., 2020). Several studies have found that age has a significant impact on PEOU (Chien et al., 2019; Hor et al., 2020).

### **Perceived Enjoyment (PE)**

Perceived enjoyment (PE) is defined as "the extent to which the activity of using a specific system is perceived to be enjoyable in and of itself, apart from any performance consequences resulting from system use" (Venkatesh, 2000; Jarina et al., 2019). Perceived Enjoyment (PE) was added later on into the TAM because they discovered that it could influence technology acceptance (Lee et al., 2006). Aside from PU and PEOU, PE is an important factor influencing behavioral intention (Lee et al., 2006). Furthermore, Perceived Enjoyment (PE) is an important factor in technology adoption (Venkatesh et al., 2012; Lewis & Loker, 2014; Jarina et al., 2019). Through perceived enjoyment, customers become interested in and accepting of the use of technology (Yang & Gheeta, 2019). Customers, for example, will return to McDonald's because they enjoyed using the SSTs to order their meal in the restaurant (Jarina et al., 2019). Consumer intention to use new technology is positively correlated with perceived enjoyment (PE). Customers will enjoy and be excited to use the new technology if it has an enjoyable element to it (Ulaan et al., 2016; Yang & Gheeta, 2019). Another previous study found that consumer satisfaction with SSTs will encourage future repurchases when there is an enjoyable element to try (Norazah & Norbayah, 2011; Yang & Gheeta, 2019). Furthermore, PE had a significant influence on the intention to use SSTs (Dabholkar & Bagozzi, 2002; Yang & Gheeta, 2019).

### **Perceived Safety Risk**

Perceived risk is commonly associated with the perception of uncertainty and adverse outcomes in purchasing. It is often represented by safety and security issues such as the impact of terrorism threats towards tourism destinations (Mohd Ayob & Masron, 2014; Som et al., 2015; Tan et al., 2017; Alkabsawneh & Alfandi, 2015), as well as infectious disease outbreaks, including the recent COVID-19 (Bakar & Rosbi, 2020; Hasanat et al., 2020). Previous studies claim that perceived risk is a subjective evaluation and should be conducted and measured based on the risk experience (Yang & Nair, 2014). Risk perception often triggers a distressing signal to customers' behavioral intention in the event they perceive any harmful consequence from a particular measure (Kani et al., 2017; Visschers & Siegrist, 2008). Consumers who perceived the risk of being high (Kani et al., 2017). tend to reflect a negative usage intention compared to those who perceive low-level risk (Tavitiyaman & Qu, 2013; Sinha et al., 2021).

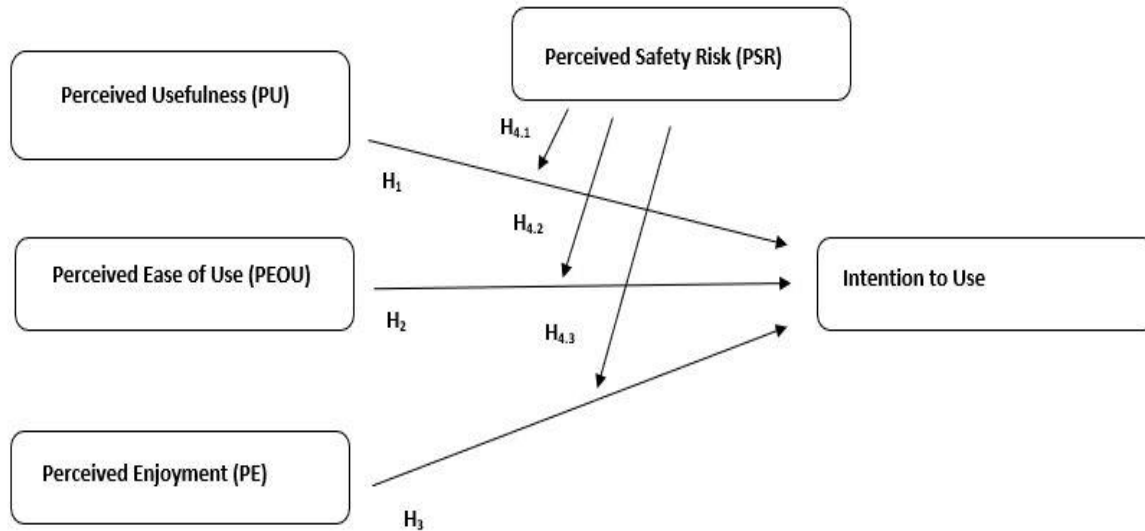
### **Intention to Use**

Intention to use is also known as behavioral intention (BI) (Yang & Gheeta, 2019). In the TAM, it also serves as a dependent variable. It is possible to derive the two variables, perceived usefulness and perceived ease of use, from the TAM (Yang & Gheeta, 2019). It focuses on consumers' willingness to adopt new technology (Dillon, Morris & William, 1996; Yang & Gheeta, 2019). According to the TAM framework, intent to use is influenced by Perceived Usefulness, Perceived Ease of Use, and Perceived Enjoyment (Rastegar et al., 2018). When customers have the ability to use new technology, their intention to use increases (Yang & Gheeta, 2019). In a nutshell, refers to a person's proclivity to use new technologies (Yang, 2012; Yang & Gheeta, 2019).

### Proposed Framework

Using the Technology Acceptance Model from Davis (1989), this study will predict the impact of Perceived Usefulness (PU), Perceived Ease of Use (PEOU) and Perceived Enjoyment (PE) towards the intention of using fast food self-service kiosk amongst the university student population. Intention to use is the dependent variable in this study. Perceived Safety Risk is injected into the model as the sole moderating variable. Figure 1 below shows the conceptual framework for this study.

**Figure 1: Conceptual Framework**



From the above model, the following hypotheses were formulated:

**H<sub>1</sub>:** There is a causal relationship between perceived usefulness and the intention to use among university students.

**H<sub>2</sub>:** There is a causal relationship between perceived ease of use and intention to use a self-service kiosk among university students.

**H<sub>3</sub>:** There is a causal relationship between perceived enjoyment and intention to use self-service kiosks among university students.

**H<sub>4.1</sub>:** Perceived safety risk moderates the causal relationship between perceived usefulness and intention to use a self-service kiosk among university students.

**H<sub>4.2</sub>:** Perceived safety risk moderates the causal relationship between perceived ease of use and intention to use self-service kiosks among university students.

**H<sub>4.3</sub>:** Perceived safety risk moderates the relationship between perceived enjoyment and intention to use self-service kiosks among university students.

### 3. Research Methodology

#### Questionnaire Structure

Questionnaires which are structured into four major parts were utilized to obtain data from the respective respondents. A number of items in each construct are listed in Table 1. Section A comprises respondents' demographic profile, such as gender, ethnicity, age, state of origin, area of residence, education level, frequency of visiting fast food restaurants and frequency of using self-service kiosks. Section B is divided into 3 subsections encompassing Perceived Usefulness, Perceived Ease of Use and Perceived Enjoyment. Meanwhile, Perceived Safety risk is represented by 4 items in Section C. Lastly, Section D comprises items relating to Intention to use. Items were adapted from past studies relating to the usage of Technology Acceptance Model within the context of self-service kiosk at fast food restaurant, banks, airlines check in as well as usage of multimedia in education (Jarina et al., 2019; Weng et al., 2018; Teo and Noyes, 2011; Mexen et al., 2015) in

which Five-point Likert scale (1= strongly disagree to 5= strongly agree) were opted to measure the relevant items.

**Table 1: Dimensions, numbers, and sources of the items**

| Section | Variables                                   | No of Items | Sources                                      |
|---------|---------------------------------------------|-------------|----------------------------------------------|
| A       | Demographic Background                      | 8           | Self-developed                               |
| B       | Technology Acceptance Model (TAM) variables |             |                                              |
| B1      | Perceived Usefulness (PU)                   | 7           | Jarina et al. (2019),<br>Weng et al. (2018)  |
| B2      | Perceived Ease of Use (PEOU)                | 7           | Jarina et al. (2019), Weng et al., (2018)    |
| B3      | Perceived Enjoyment (PE)                    | 5           | Teo and Noyes (2011)                         |
| C       | Perceived Safety Risk                       | 4           | Baba, et al, 2023                            |
| D       | Intention to Use                            | 5           | Teo and Noyes (2011),<br>Mexen et al. (2015) |

#### Data Collection Process

A total of 400 completed responses were obtained from students in two campuses in Kuala Terengganu, Malaysia, using a cross-sectional approach through online structured questionnaires. The necessary ethical clearance was obtained from Universiti Malaysia Terengganu Research Ethics Committee (UMT/JKEPM/2002/99), Online questionnaire distribution was opted for as the country was still imposing restrictions limiting the number of customers that can be inside food premises during the time of survey. The data collection process lasted two months, from August 1st to September 30th, 2021.

#### Statistical Analysis

Data were analyzed through SPSS 25.0 using a frequency test and descriptive statistics to determine demographic characteristics. The partial least squares (PLS-SEM) was used to investigate correlations between variables, test hypotheses, and evaluate models in the proposed framework and model. It usually involves evaluating the measurement model, followed by a structural path analysis (Ramayah et al., 2018; Hair et al., 2011) and has been used for theory building or confirmation (Hair et al., 2014). It is also suitable for proposition formulation via variable association. The multivariate analysis was then used to uncover differences in technology usage among people of different ages and genders. According to Tabachnick and Fidell (2007), PLS-SEM is fundamentally a confirmatory approach for model testing.

## 4. Results

#### Respondent profile

Six demographic categories, including gender, age, ethnicity, education level, area of residence, frequency of eating at fast food restaurants and frequency of using SSK at fast food restaurants were reported in Table 2.

**Table 2: Demographic Profile of Respondents**

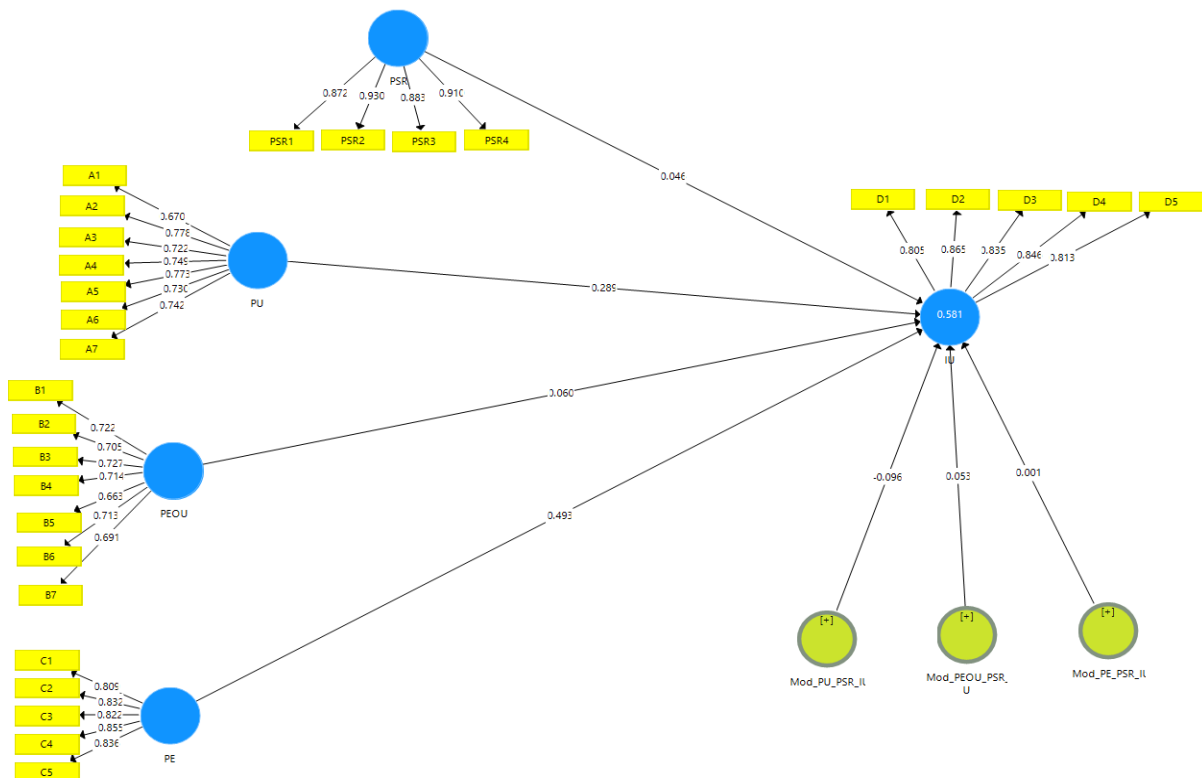
| Characteristics   | Number of respondents<br>(n=400) | Percentage (%) |
|-------------------|----------------------------------|----------------|
| <b>Gender</b>     |                                  |                |
| Male              | 85                               | 21.3           |
| Female            | 315                              | 78.6           |
| <b>Age</b>        |                                  |                |
| 18 - 21 years old | 67                               | 16.8           |
| 22 - 25 years old | 328                              | 82             |
| 26 - 29 years old | 4                                | 1              |
| >29 years old     | 1                                | 0.2            |
| <b>Ethnicity</b>  |                                  |                |
| Malay             | 116                              | 29             |
| Chinese           | 270                              | 67.5           |

|                                                                         |     |      |
|-------------------------------------------------------------------------|-----|------|
| Indian                                                                  | 13  | 3.3  |
| Dusun                                                                   | 1   | 0.3  |
| <b>Current education level</b>                                          |     |      |
| Foundation                                                              | 3   | 0.8  |
| Diploma                                                                 | 5   | 1.2  |
| Bachelor's degree                                                       | 388 | 97.0 |
| Postgraduate                                                            | 4   | 1.0  |
| <b>Area Residing</b>                                                    |     |      |
| Rural Area                                                              | 103 | 25.8 |
| Urban Area                                                              | 297 | 74.3 |
| <b>Frequency of visiting a fast food restaurant.</b>                    |     |      |
| Less than once a week                                                   | 244 | 61.0 |
| Once a week                                                             | 126 | 31.5 |
| 2-4 times a week                                                        | 30  | 7.5  |
| <b>Frequency of using self-service kiosks at a fast food restaurant</b> |     |      |
| Less than once a week                                                   | 315 | 78.8 |
| Once a week                                                             | 67  | 16.8 |
| 2 - 4 times a week                                                      | 18  | 4.5  |

### The Measurement Model Assessment

The measurement model is executed to establish the reliability and validity of the construct measures and will be used as a support to determine the suitability of the construct measures for inclusion in the pathway model. Figure 2 and Table 4 present the outer loading scores as well as results relating to the measurement model evaluation.

Figure 2: Measurement Model



As presented in Table 3, the indicator loadings scores are between 0.720 and 0.855, exceeding the recommended value(0.7), suggesting a satisfactory degree of reliability. Meanwhile, the Composite Reliability value ranged from 0.874 and 0.919, thus affirming the items' internal consistency (Hulland, 1999; Diamantopoulos et al,2012). Next, the Average Variance Extracted (AVE) value was recorded between 0.528 to 0.694, achieving convergent validity satisfactorily (Hulland, 1999).

**Table 3: Results of Measurement Model**

| Latent Variable       | Code | Items | Outer Loading | Cronbach's Alpha | Composite Reliability | Average Variance Extracted (AVE) |
|-----------------------|------|-------|---------------|------------------|-----------------------|----------------------------------|
| Perceived Usefulness  | PU   | A1    | 0.67          | 0.861            | 0.893                 | 0.545                            |
|                       |      | A2    | 0.778         |                  |                       |                                  |
|                       |      | A3    | 0.722         |                  |                       |                                  |
|                       |      | A4    | 0.749         |                  |                       |                                  |
|                       |      | A5    | 0.773         |                  |                       |                                  |
|                       |      | A6    | 0.73          |                  |                       |                                  |
|                       |      | A7    | 0.742         |                  |                       |                                  |
| Perceived Ease of Use | PEOU | B1    | 0.722         | 0.832            | 0.874                 | 0.528                            |
|                       |      | B2    | 0.705         |                  |                       |                                  |
|                       |      | B3    | 0.727         |                  |                       |                                  |
|                       |      | B4    | 0.714         |                  |                       |                                  |
|                       |      | B5    | 0.663         |                  |                       |                                  |
|                       |      | B6    | 0.713         |                  |                       |                                  |
|                       |      | B7    | 0.691         |                  |                       |                                  |
| Perceived Enjoyment   | PE   | C1    | 0.809         | 0.888            | 0.918                 | 0.690                            |
|                       |      | C2    | 0.832         |                  |                       |                                  |
|                       |      | C3    | 0.822         |                  |                       |                                  |
|                       |      | C4    | 0.855         |                  |                       |                                  |
|                       |      | C5    | 0.836         |                  |                       |                                  |
| Intention Use         | IU   | D1    | 0.805         | 0.89             | 0.919                 | 0.694                            |
|                       |      | D2    | 0.865         |                  |                       |                                  |
|                       |      | D3    | 0.835         |                  |                       |                                  |
|                       |      | D4    | 0.846         |                  |                       |                                  |
|                       |      | D5    | 0.813         |                  |                       |                                  |

As shown in Table 4, the square roots of the AVE that are in bold font, recorded between a value of 0.705 to 0.833. This fulfills the criteria as stated by Fornell and Larcker (1981b), thus confirming the discriminant validity of the model.

**Table 4: Latent Variables Correlation Using the Fornell-Larcker Criteria**

|                       | IU           | PE           | PEOU         | PU |
|-----------------------|--------------|--------------|--------------|----|
| Intention Use         | <b>0.833</b> |              |              |    |
| Perceived Enjoyment   | 0.716        | <b>0.831</b> |              |    |
| Perceived Ease of Use | 0.599        | 0.661        | <b>0.705</b> |    |

|                       |        |        |        |              |
|-----------------------|--------|--------|--------|--------------|
| Perceived Safety Risk | -0.057 | -0.113 | -0.028 |              |
| Perceived Usefulness  | 0.645  | 0.631  | 0.729  | <b>0.739</b> |

Analysis using Heterotrait-Monotrait Ratio of Correlations as shown in Table 5 confirms no discriminant validity problems (HTMT<0.85 criteria). Collinearity problems among the latent constructs were not present. Overall, the measurement model confirms that discriminant validity exists between the relevant constructs. Lastly, the global goodness of fit model for the saturated(0.053) and estimated model (0.053) meets the criterion of SRMR < 0.08 (Henseler et al. 2016).

**Table 5: Heterotrait-Monotrait Ratio of Correlations (HTMT) Results**

|                              | IU    | PE    | PEOU | PU |
|------------------------------|-------|-------|------|----|
| <b>INTENTION USE</b>         |       |       |      |    |
| <b>PERCEIVED ENJOYMENT</b>   | 0.8   |       |      |    |
| <b>PERCEIVED EASE OF USE</b> | 0.692 | 0.764 |      |    |
| <b>PERCEIVED USEFULNESS</b>  | 0.731 | 0.719 | 0.85 |    |

### Structural Model Assessment

Upon completing the measurement model, the second step in PLS-SEM involves evaluating the structural model. The structural model results were compiled in Table 6. Both the R<sup>2</sup> and Q<sup>2</sup> recorded values of 0.581 and 0.562 indicating a satisfactory level of predictive accuracy and predictive relevance.

**Table 6: Path Coefficient ( $\beta$ ), T-Value and Significance Level**

|                                           | B     | T STATISTICS | P VALUES | R <sup>2</sup> | Q <sup>2</sup> | HYPOTHESIS  |
|-------------------------------------------|-------|--------------|----------|----------------|----------------|-------------|
| PERCEIVED USEFULNESS -> INTENTION TO USE  | 0.055 | 9.038        | <0.001   | 0.581          | 0.562          | SIGNIFICANT |
| PERCEIVED EASE OF USE -> INTENTION TO USE | 0.062 | 9.272        | 0.005    |                |                | SIGNIFICANT |
| PERCEIVED ENJOYMENT -> INTENTION TO USE   | 0.070 | 4.146        | <0.001   |                |                | SIGNIFICANT |

Notes: 99% confidence interval: p-value<0.00\*\*\*, 95% confidenceinterval: p-value<0.05\*\*

The first hypothesis (H<sub>1</sub>) states that Perceived Usefulness positively influences Intention to Use. The results reveal that Perceived Usefulness has a significant positive impact on customers' intention to use the self-ordering kiosk ( $\beta$  = 0.055, t-value = 9.038). Thus, the proposed H<sub>1</sub> is supported. Findings are in line with previous studies as the utilization of self-service kiosks in various hospitality-related sectors would indeed streamline and enhance customer service experience (Tsai and Gheeta,2019; Wang,2012; Yang and Gheeta, 2019)

The second hypothesis (H<sub>2</sub>) mentions that Perceived Ease of Use has a positive effect on customers' Intention to Use. The results affirm the significant positive influence ( $\beta$  = 0.062, t-value = 9.272). Therefore, H<sub>2</sub> is statistically supported. As highlighted by previous studies, a self-service kiosk is designed to simplify usage amongst customers as it allows them to cut down multiple processes, thus encouraging intention to use (Collier & Kimes, 2013; Tsai & Gheeta, 2019; Gunawardana, Kulathunga & Perera, 2015; Aboelmaged & Gebba, 2013; Kattara and Said, 2014).

Similarly, the results obtained also support the third hypothesis (H<sub>3</sub>), i.e., a significant and positive relationship between perceived Enjoyment andintention to use ( $\beta$  = 0.070, t-value = 4.146). Often when any technology that is easy to use and is continuously being improved to be very interactive, it would often create the sense of emotional enjoyment of usage amongst customers including the younger tech savvy generations (Chin & Ahmad, 2015; Ulaan, Pangemanan & Lambey, 2016; Tsai & Gheeta, 2019; Baba, et al, 2023; Kim et al., 2013a, 2013b)

### Moderating Effects

Perceived Safety Risk was hypothesised to moderate the relationship between Perceived Ease of Use, Perceived Enjoyment and Perceived Usefulness towards Intention To Use. Results of the moderating effect of Perceived Safety Risk are compiled in Table 7, adapting the technique employed by Chin et al. (2003) proposition.

**Table 7: Moderating Effect of the Perceived Safety Risk**

|                                                                | BETA<br>(B) | T<br>STATISTICS | P VALUES | RESULT                 |
|----------------------------------------------------------------|-------------|-----------------|----------|------------------------|
| PERCEIVED EASE OF USE + PERCEIVED SAFETY RISK -> INTENTION USE | 0.066       | 0.792           | 0.214    | <b>Not Significant</b> |
| PERCEIVED ENJOYMENT + PERCEIVED SAFETY RISK -> INTENTION USE   | 0.070       | 0.008           | 0.497    | <b>Not Significant</b> |
| PERCEIVED USEFULNESS + PERCEIVED SAFETY RISK -> INTENTION USE  | 0.095       | 1.011           | 0.156    | <b>Not Significant</b> |

Based on the analysis, it was found that perceived safety risk does not have a noticeable moderating effect between all three predictor variables (Perceived Usefulness, Perceived Ease of Use, Perceived Enjoyment) towards intention to use. Thus, H<sub>4.1</sub>, H<sub>4.2</sub> and H<sub>4.3</sub> are rejected. Similar to the argument made by Baba et al (2023), the associated risk related to COVID-19 was significant enough to discourage customers from making purchases at fast food restaurants using the self-ordering kiosk technology. This was due to significant changes made for fast food operations during and after the COVID-19 pandemic, such as implementing cashless transactions (Hao et al., 2020), while regularly sanitizing the self-service kiosk screen. When proper precautions are continuously practiced, it eliminates the sense of potential risk deterring customers from using a self-service kiosk (Baba et al, 2023)

### Limitations and Suggestions

Several limitations in this research can be improved to obtain more accurate findings in the future. Firstly, the youth sample of this research only involved the students from two Malaysian public universities. Hence, future research relating to self-service kiosk usage intention can be carried out on different youth demographics who are already in the workforce in Malaysia to make the study more generalizable. As this study found that perceived safety risk to not a strong moderator, the roles of other variables such as age generation, rural-urban background, perceived value, and trust could be explored to understand self-service kiosk usage intention from a different perspective.

### 5. Implications and Conclusion

As a recap, findings of this study suggest that Perceived usefulness (PU), perceived ease of use (PEOU) and perceived enjoyment (PE) did affect intention to use self-service kiosk amongst university students. However, Perceived Safety Risk was found not to have a significant moderating effect on intention to use the self-service kiosk. Adoption of self-service kiosk technology into fast food operations has helped lessen service failures associated with conventional cashiers due to the simplified and streamlined process. While it is well accepted by the youth generation, in which most are undergoing undergraduate studies, support for continuous investment in self-service kiosks is needed. Periodic hardware and software upgrades would make the self-service kiosk more interactive and easier to use for a wider social demographic of fast food customers. An improved user interface can showcase richer information regarding products and services will indeed be helpful for customers to make a sound purchase decision. From the perspective of restaurant operators, the well-optimized self-service kiosk will enable them to forecast customer purchase patterns, which would benefit the menu cycle process and pricing.

Despite the fear of potential transmission of COVID-19 due to the touchscreen surface being operated by many users, such risk was not evident enough to discourage even the younger generations from using self-service kiosks. Nevertheless, cleaning and sanitation of touchscreens should be continuously practiced by the fast-food management even in the post-pandemic stage of COVID-19.

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