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RESEARCH ARTICLE

To Buy or Not to Buy: Factors Affecting E-Commerce Intention after Endemic Covid-19 Among University Students

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ABSTRACT

E-commerce has become a popular platform for purchasing and selling goods and services. Understanding the impact of these factors on e-commerce intentions can help businesses adapt to changing consumer behavior and improve their online marketing strategies. Moreover, those already adopting e-commerce were better positioned to adapt to the changing business environment. However, those without adopting e-commerce were forced to implement e-commerce strategies to survive rapidly. Drawing on a refined e-commerce adoption framework, this study aims to determine the factors affecting e-commerce purchase intention among university students after the Endemic COVID-19. The study used a quantitative methodology with structural equation model (SEM-PLS) analysis. The usable data of 256 respondents were used to validate the conceptual model through factor analysis and multiple regression analysis. The study has found that perceived risk, social media usefulness, the emotion attached, and perceived behavioral control significantly influence e-commerce purchase intention. Findings revealed that the use of technology by university students could improve effective business strategies to attract and retain more students who are shopping online, utilize e-commerce platforms, and implement social commerce strategies. Finally, some specific suggestions are recommended for educational institutions in devising effective marketing strategies.

INTRODUCTION

The COVID-19 pandemic has significantly transformed consumer behavior, particularly in the realm of e-commerce. Lockdowns and social distancing measures prompted many consumers to turn to online shopping as a safer and more convenient alternative to traditional retail. This shift led to a remarkable surge in global e-commerce activity. According to eMarketer, global e-commerce sales reached $4.28 trillion in 2020, representing a 27.6% increase from the previous year, with projections to exceed $5.4 trillion by 2022. This trend is characterized by an average annual growth rate of 15% over the past five years.

Malaysia's e-commerce market has mirrored this global trend, experiencing substantial growth. The Malaysian Communications and Multimedia Commission (MCMC) reported a 23.3% increase in e-commerce activity in 2020, driven by online retail sales and the rapid adoption of digital payment

methods. Government initiatives such as the National eCommerce Strategic Roadmap aim to double the nation's e-commerce growth rate by 2025. Despite this robust growth, there is a limited understanding of the factors that influence e-commerce intentions among Malaysian consumers in the post-pandemic context.

While the pandemic-induced growth of e-commerce is well-documented, the longer-term factors shaping e-commerce intentions remain underexplored. This study addresses this gap by examining specific factors—perceived risk, social media usefulness, emotional attachment, and perceived behavioral control—that affect e-commerce intentions among university students after the COVID-19 pandemic.

Perceived risk has long been recognized as a critical barrier to online shopping, influencing consumers' decisions to engage in e-commerce. Given the heightened health and safety concerns during the pandemic, it is essential to reassess how perceived risk impacts e-commerce intentions in the current context. Additionally, social media has become increasingly prominent, serving not only as a platform for social interaction but also as a powerful marketing tool. Understanding how social media usefulness influences e-commerce intentions can provide valuable insights for businesses looking to leverage these platforms effectively. Moreover, emotional attachment to online shopping experiences and perceived behavioral control over the shopping process are significant determinants of e-commerce intentions. Emotional attachment drives repeat purchases and fosters customer loyalty, while perceived behavioral control reflects consumers' confidence in their ability to navigate and complete online transactions successfully.

This study aims to fill the existing research gap by exploring these factors among university students, a demographic representing a substantial portion of the online consumer market. The objectives are to identify and analyze the key factors influencing e-commerce intentions post-pandemic and to provide actionable insights for businesses to enhance their e-commerce strategies. Thus, this study uniquely examines post-pandemic e-commerce intentions among university students, a demographic not extensively studied in this context. By focusing on perceived risk, social media usefulness, emotional attachment, and perceived behavioral control, this research provides a comprehensive understanding of the factors influencing e-commerce intentions in the post-pandemic era. The findings offer valuable insights for businesses aiming to adapt to the evolving consumer landscape and enhance their e-commerce strategies. Thus, this study contributes to the existing literature by providing a detailed analysis of the factors affecting e-commerce intentions in the post-pandemic era. By focusing on university students, it offers valuable perspectives on the future of e-commerce and practical recommendations for businesses to adapt to the evolving consumer landscape.

LITERATURE REVIEW AND RESEARCH FRAMEWORK

E-commerce Intention

E-commerce has revolutionized the business landscape, allowing consumers to purchase goods and services with unprecedented convenience and efficiency (Tian & Stewart, 2008; Waheed et al., 2010). In today's competitive market, it serves as a crucial bridge connecting consumers and suppliers (Carpio & Lange, 2015). E-commerce, e-business, or electronic commerce all refer to the act of purchasing goods and services through electronic communication methods, bringing transformative changes to the business world (Al-Dmour, Al-Zu'bi, & Kakeesh, 2020; Rahman et al., 2024). Different scholars have defined e-commerce in various ways. Fruhling and Digman (2000) define e-commerce as "a way to market and sell goods and services to consumers using the Internet." Similarly, Magal, Kosalge, and Levenburg (2001) describe it as "the use of the Internet and computers to buy and/or sell goods, services, or information." These definitions, however, are somewhat narrow as they limit e-commerce to Internet-based transactions only. A broader perspective is necessary to encompass

various digital platforms and electronic communication methods, which enhance the scope and applicability of e-commerce.

E-commerce significantly impacts businesses and consumers. It enables consumers to find products and services quickly, efficiently, and cost-effectively with just a few searches online (Al-Dmour et al., 2020). For businesses, e-commerce reduces operational costs and provides access to a global market. However, challenges such as cybersecurity and maintaining customer trust remain significant. Despite these challenges, the advantages of e-commerce are evident, particularly in terms of consumer convenience and business expansion. Furthermore, e-commerce has offered developing countries opportunities for economic growth and increased participation in the global trade system. For instance, the rise of mobile money platforms in Kenya has facilitated e-commerce transactions, boosting trade and economic development (Dan, 2014). This trend highlights how e-commerce helps underdeveloped economies increase their trade profits and access new growth opportunities.

The COVID-19 pandemic has further accelerated the adoption of e-commerce, changing consumer behavior to prioritize safety and convenience in their shopping habits. According to Bain & Company (2020), the number of e-commerce shoppers could reach 300 to 350 million by the financial year 2025. Additionally, a survey by UNCTAD (2020) revealed significant sales growth for e-commerce websites during the pandemic. These trends suggest that the reliance on e-commerce will continue to grow post-pandemic, driven by the need for convenience and safety in shopping. Hence, e-commerce has reshaped the way businesses and consumers interact, providing numerous benefits while presenting some challenges. Its impact on developing countries and the acceleration of its adoption due to the pandemic are noteworthy. As e-commerce continues to evolve, its role in global trade and consumer behavior will likely expand, warranting further research and exploration.

Perceived Risk

Perceived risk, defined by Salem and Nor (2020) as a subjective expected loss, and by Featherman and Pavlou (2001) as the potential loss when pursuing a desired outcome, plays a crucial role in consumer behavior. This concept has gained significant attention during the COVID-19 pandemic, where perceived risk pertains to the health hazards associated with physical shopping in malls and stores. Researchers argue that perceived risk has led to a shift in consumer behavior, with an increase in online shopping preferences, maintenance of physical distance, and avoidance of contact with others (Kim, Kim, & Wang, 2021). Various studies have reported a surge in online sales during the COVID-19 pandemic (Nguyen, Cao, & Tran, 2020; Yan, Wang, & Zhang, 2020).

During public health crises like the COVID-19 pandemic, high perceived risk leads to changes in consumer behavior, particularly in online purchases. Consumers tend to opt for products and services that minimize perceived risk, prioritizing safety and convenience (Emami, Elahi, & Naseri, 2021). The increase in online purchases during the pandemic reflects this shift, as consumers seek to avoid physical stores and prioritize their health and security (Ali, 2020). Researchers confirm that perceived risk is a subjective factor in online shopping and significantly influences the intention to purchase online (Ashoer & Said, 2016). When consumers perceive high levels of risk, they engage in extensive information search, evaluation, and consideration of alternatives before making a purchase decision. To influence consumer decision-making and facilitate positive purchase outcomes, businesses must understand and address consumers' perceived risks. Strategies such as providing detailed product information, ensuring secure payment methods, and offering flexible return policies can help mitigate perceived risk and build consumer trust.

Therefore, perceived risk significantly influences consumer behavior, particularly in the context of online shopping during the COVID-19 pandemic. Businesses must understand and address these perceived risks to effectively influence consumer decision-making and enhance their competitive

advantage. Further research is needed to explore the long-term impacts of perceived risk on consumer behavior and online shopping trends.

Social Media Usefulness

Social media usefulness refers to the value that social media platforms provide to consumers, encompassing information, interactions, and resources that influence their e-commerce intentions. Defined as internet applications facilitating information exchange and interaction (Kaplan & Haenlein, 2010), social media plays a crucial role in product discovery, information sharing, and user engagement. These platforms enable consumers to access user reviews, recommendations, and other user-generated content, which are vital for informed decision-making in online shopping (Hajli et al., 2017).

Extensive research highlights the significant impact of social media on brand loyalty and awareness. For instance, Huang et al. (2018) and Zeqiri et al. (2020) have shown that social media enhances brand visibility and strengthens consumer-brand relationships. Nisar and Whitehead (2016) and Pentina et al. (2013) further demonstrate that consumers' positive attitudes toward social media advertising are influenced by its perceived usefulness, which drives engagement with marketing activities. The Technology Acceptance Model (TAM) provides a theoretical framework for understanding the role of social media in e-commerce. TAM posits that perceived usefulness and ease of use are critical factors influencing technology adoption (Venkatesh & Bala, 2008). In the context of social media, perceived usefulness impacts consumers' engagement by offering valuable information and facilitating purchasing decisions (Cho & Fiorito, 2009). This theoretical perspective supports the observation that positive consumer attitudes towards social media marketing are driven by the platforms' perceived benefits (Alalwan, 2018; Sin et al., 2012).

Social media platforms offer businesses an opportunity to enhance brand awareness and expand their reach. Effective social media marketing strategies enable companies to showcase products or services, engage with potential customers, and build a positive brand image (Huang et al., 2018). By leveraging social media, businesses can influence consumer awareness and consideration, ultimately shaping their e-commerce intentions. Moreover, social media plays a critical role in the consumer decision-making process by providing access to product reviews, user-generated content, and peer recommendations. This access helps consumers make informed choices and enhances the perceived value of social media as a resource for evaluating products, brands, and sellers (Hajli et al., 2017). However, despite its advantages, social media marketing faces challenges such as privacy concerns, data security, and the risk of misinformation, which can impact consumer trust and engagement.

Recent trends and emerging technologies are shaping the future of social media in e-commerce. For example, the integration of artificial intelligence (AI) and machine learning is enhancing personalized marketing and customer interactions, while virtual and augmented reality are offering new ways for consumers to experience products (Smith & Anderson, 2023). Future research should explore these developments to better understand their impact on consumer behavior and e-commerce dynamics. Furthermore, social media significantly influences consumer behavior in e-commerce by enhancing brand visibility, engagement, and information access. The integration of social media usefulness within theoretical frameworks such as TAM enriches our understanding of its impact on consumer decision-making. Continued exploration of emerging technologies and trends will further elucidate the evolving role of social media in shaping e-commerce practices.

Emotion Attached

The COVID-19 pandemic has profoundly affected consumer behavior, particularly through the phenomenon of panic buying. Defined as a sudden and excessive increase in the purchase of essential goods during crises, panic buying is driven by a disparity between supply and demand (Marty & Jamie, 2021). This behavior is closely linked to various psychological factors, including fear, anxiety,

and heightened uncertainty (Liren et al., 2012). Psychological responses to infectious disease outbreaks have been extensively documented. During such crises, individuals often experience heightened levels of fear, anxiety, depression, and a sense of isolation (Leung et al., 2004; Maunder et al., 2003; Sim et al., 2020). These emotional states significantly influence consumer behavior. For instance, Sim et al. (2020) and Yuen et al. (2020) argue that psychological factors play a crucial role in exacerbating consumer anxiety and the tendency toward panic buying.

The COVID-19 pandemic intensified these psychological responses, leading to noticeable shifts in consumer behavior. Ait Youssef et al. (2020) found that heightened emotions during the pandemic led consumers to mitigate their perceived risk and panic by engaging in online shopping. This behavior reflects a coping mechanism where online purchases are perceived as safer and less stressful compared to in-store shopping, thus reducing immediate anxiety and panic. Conversely, some researchers have pointed out that consumers' early buying of essential items contributed to significant market disruptions, including increased prices, stockouts, and long waiting lines (Akhtar et al., 2020; Tsao et al., 2019). This perspective highlights the broader implications of panic buying, suggesting that while such behavior is a response to emotional distress, it also has tangible effects on supply chains and market stability. This viewpoint underscores the complexity of consumer behavior during crises and the need to understand both the psychological and economic dimensions.

Therefore, the emotional responses to the COVID-19 pandemic, including heightened fear and anxiety, have significantly influenced consumer behavior. These emotions have led to increased panic buying and a shift towards online shopping as a coping mechanism. However, the resultant market disruptions highlight the broader implications of such behavior. Further research is essential to explore these dynamics in greater depth and develop strategies to mitigate the negative impacts of panic buying on both consumers and supply chains.

Perceived Behavioral Control

Perceived behavioral control (PBC) is a pivotal concept in understanding consumer behavior, particularly in the context of e-commerce. According to Ajzen and Madden (1986), PBC refers to “the individual’s perceptions of the presence or absence of requisite resources and opportunities,” reflecting an individual’s assessment of their ability to perform a specific behavior and the level of control they believe they have over the outcome. This encompasses factors such as self-efficacy, confidence, perceived resources, and external constraints that influence one's perception of control.

In the realm of e-commerce, PBC is crucial for shaping online purchasing behavior. Ajzen (2002) explains that PBC involves the subjective degree of control over performing a behavior, which affects an individual's confidence in managing online transactions. When consumers perceive a high level of control over their online shopping experiences, they are more likely to engage in e-commerce activities and complete transactions. Research highlights that consumers with a strong sense of control are more confident in navigating online platforms, which translates to increased usage and satisfaction (Smith et al., 2021).

Recent studies underscore the significance of PBC in influencing online consumer behavior. Zhang and Li (2022) found that consumers who perceive greater control over their online shopping process are more inclined to participate in e-commerce and achieve successful purchase outcomes. This finding emphasizes the need for e-commerce platforms to focus on enhancing features that boost perceived control, such as intuitive navigation, responsive customer support, and secure payment systems. By improving these aspects, e-commerce businesses can foster greater consumer confidence and engagement.

Moreover, PBC is intricately linked to self-regulation and self-control. Individuals with a heightened sense of control are better equipped to regulate their behavior, resist impulsive decisions, and remain focused on their long-term goals (Bandura, 1997). In the context of e-commerce, this means that

enhancing perceived control can help consumers make more deliberate and informed purchasing decisions, aligning their choices with their broader interests and values. Understanding PBC provides valuable insights into consumer behavior and offers practical implications for e-commerce platforms. By addressing factors that enhance perceived control, such as improving user interface design and customer service, businesses can enhance consumer satisfaction and loyalty. As the e-commerce landscape continues to evolve, ongoing research into PBC will be essential for developing effective strategies to meet consumer needs and improve market outcomes. Finally, perceived behavioral control is a crucial determinant of online consumer behavior. It influences how confident individuals feel about their ability to complete online transactions and affects their overall engagement with e-commerce platforms. Addressing PBC through enhanced user experience and support can lead to more positive consumer interactions and better business outcomes.

Technology Acceptance Model

The Technology Acceptance Model (TAM), developed by Fred Davis in 1986, provides a fundamental framework for understanding how users come to accept and use technology. The model posits that technology acceptance is primarily influenced by two factors: perceived ease of use and perceived usefulness (Davis, 1989). Perceived ease of use refers to the degree to which a person believes that using the technology will be free of effort, while perceived usefulness pertains to the belief that the technology will enhance job performance or deliver other significant benefits. According to TAM, these perceptions shape users' attitudes towards the technology, which in turn influence their behavioral intentions and actual usage (Davis, 1993).

Originally designed to explain computer technology acceptance, TAM has been extended to a wide range of technologies. Kamal, Shafiq, and Kakria (2020) applied TAM to study the adoption of telemedicine services, revealing that both perceived ease of use and perceived usefulness significantly impacted users' acceptance of telemedicine technologies. Similarly, Scherer, Siddiq, and Tondeur (2019) employed TAM to explore the acceptance of digital technologies among teachers, demonstrating that educators' perceptions of ease of use and usefulness were crucial in determining their adoption of these technologies. The model has also been applied to mobile applications and e-learning platforms. Min, So, and Jeong (2019) investigated mobile app usage, finding that users' perceptions of ease of use and usefulness were strong predictors of their intention to use and actual use of mobile applications. Furthermore, Sukendro et al. (2020) utilized TAM to examine e-learning environments, showing that students' perceptions of ease of use and usefulness significantly influenced their engagement with online learning platforms.

Recent research continues to validate and expand TAM's applicability. Abdulkadir and Mohammad (2020) explored its use across various information and communication technologies, including healthcare systems and mobile financial technology, reinforcing TAM's robustness in explaining technology acceptance across diverse contexts. Additionally, Nornazurah et al. (2016) highlighted the relationship between perceived usefulness and usage intention, emphasizing TAM's relevance in understanding technology adoption through cognitive and social processes. The practical implications of TAM are significant for both technology developers and users. For developers, insights from TAM can inform the design of technologies that are more user-friendly and aligned with users' needs, potentially increasing adoption rates. For users, understanding TAM can facilitate informed decisions about new technologies based on their perceived ease of use and usefulness.

Perceived Risk and E-Commerce Intention

The coronavirus was initially identified as an unknown virus in December 2019 in Wuhan, China, and later renamed after laboratory tests (Huang et al., 2020), spread rapidly to 210 countries, causing a global crisis and fundamentally altering daily life (Tyagi & Pabalkar, 2021). As a result, the pandemic significantly influenced consumer behavior, particularly in the realm of e-commerce. Perceived risk,

a multifaceted concept that includes financial, psychological, and social dimensions, is essential for understanding consumer decisions in this context (Featherman & Pavlou, 2001). During the COVID-19 pandemic, the perceived risk of using e-commerce played a crucial role in shaping consumer intentions. This concept of perceived risk refers to the potential negative outcomes that consumers associate with online shopping, such as financial loss, privacy concerns, and the fear of receiving substandard products (Featherman & Pavlou, 2001). The pandemic heightened these concerns, as consumers were forced to rely more on digital platforms for their shopping needs due to lockdowns and social distancing measures.

Research has consistently shown that perceived risk affects consumers' e-commerce intentions. For example, Pentz et al. (2020) explored the consumer adaptation of digital technologies in online shopping and found significant differences in perceived risk between experienced and inexperienced online shoppers across different product categories. Experienced shoppers tended to have lower perceived risks compared to their inexperienced counterparts, highlighting the importance of familiarity and trust in online transactions. This differentiation underscores the complexity of perceived risk and its varying impact on different consumer segments. In the context of the COVID-19 pandemic, perceived risk influenced consumer behavior by increasing the preference for e-commerce. Kim et al. (2021) noted that health concerns and the necessity to maintain social distance led consumers to view online shopping as a safer alternative to physical stores. This shift in behavior was not merely a temporary adjustment but reflected a deeper change in consumer preferences towards e-commerce, driven by the need to avoid contact and minimize exposure to the virus.

Ali (2020) further confirmed that COVID-19, as a perceived risk, was a significant factor in boosting e-commerce intention. The pandemic created an environment where conventional shopping was considered risky, and online shopping emerged as a more viable and safer option. This shift was particularly evident during the peak phases of the pandemic when stringent lockdowns and health advisories discouraged physical shopping. Therefore, understanding the mechanisms through which perceived risk influences e-commerce intention is crucial for retailers. They must devise strategies to mitigate these risks by enhancing security measures, providing clear and transparent information, and improving the overall online shopping experience. For instance, implementing robust data protection protocols, offering easy return policies, and ensuring transparent communication about product quality can help build consumer trust and encourage the continued use of e-commerce platforms even beyond the pandemic. Given the heightened perceived risks during the COVID-19 pandemic and their documented influence on consumer behavior, this study hypothesizes that:

H1: Perceived risk has a significant relationship with e-commerce intention during the COVID-19 pandemic.

Social Media Usefulness and E-Commerce Intention

The rise of social media has significantly transformed the landscape of e-commerce. Platforms such as Facebook, Instagram, and Twitter have become essential tools for companies to engage with consumers, promote products, and facilitate electronic word-of-mouth (eWOM). eWOM, a form of user-generated content, plays a pivotal role in influencing consumer behavior and promoting e-commerce intention (Barreda et al., 2015). Through social media, companies can develop eWOM, which enhances consumer trust and encourages online purchasing (Xie et al., 2016). Research consistently demonstrates that social media promotes purchase intention by highlighting the perceived benefits of these online tools. Balakrishnan et al. (2014) found that the perceived usefulness of social media significantly impacts online purchase intentions. Similarly, Laksamana (2018) confirmed that consumers are more likely to engage in e-commerce when they perceive social media as a beneficial tool for discovering and evaluating products. These findings underscore the importance of social media in providing consumers with valuable information and fostering trust in online transactions.

Furthermore, Lim et al. (2017) explored how social media platforms facilitate information sharing and community building, which in turn promotes e-commerce intention. They found that social media usefulness is linked to increased consumer trust and purchase intention. The ability of social media to provide a platform for users to share experiences and reviews creates a sense of community and reliability, which is crucial for encouraging online purchases. In addition, Manzoor et al. (2020) emphasized the importance of social media in enhancing consumer perceptions of e-commerce platforms, leading to higher purchase intentions. Their study highlighted that social media's role in promoting green purchase intentions indicates its broader impact on consumer behavior, beyond traditional purchasing decisions. This suggests that social media's perceived usefulness extends to various aspects of consumer decision-making.

During the COVID-19 pandemic, the reliance on social media for e-commerce became even more pronounced. Ali Taha et al. (2021) highlighted that consumers over 50 preferred using social media to engage in e-commerce activities, such as online shopping, during lockdowns in European countries. This shift underscores the critical role of social media in providing accessible and reliable information, facilitating online transactions, and maintaining consumer engagement during times of crisis. Given these findings, it is evident that social media's perceived usefulness has a substantial impact on e-commerce intention. The ability of social media platforms to provide valuable information, foster trust, and enable seamless interactions makes them indispensable tools for modern e-commerce. Based on the above discussion, the following hypothesis is proposed:

H2: There is a significant relationship between social media usefulness and e-commerce intention.

Emotion attached and E-Commerce Intention

The relationship between emotion attached and e-commerce intention is a complex interplay of psychological factors that significantly influence consumer behavior. Ajzen's (1991) theory of planned behavior highlights how attitudes, subjective norms, and perceived behavioral control shape individuals' intentions and actions. Within this framework, emotions such as fear, anxiety, and uncertainty can profoundly affect attitudes toward e-commerce. Bagozzi and Warshaw (1990) suggest that emotions play a crucial role in decision-making processes, particularly by mitigating perceived risks associated with online transactions. Accurate information and positive emotional engagement can reduce consumers' fear levels, fostering a more favorable attitude toward e-commerce. Moreover, Addo et al. (2020) emphasize that in situations characterized by perceived risk and panic, heightened social awareness drives consumers to seek products and services that alleviate these negative emotions. This insight underscores the importance of emotional factors in shaping e-commerce intentions, especially in risk-laden contexts.

H3: There is a significant relationship between emotion attached and e-commerce intention.

Perceived Behavioral Control and E-Commerce Intention

Perceived behavioral control, a fundamental component of Ajzen's Theory of Planned Behavior, refers to an individual's belief in their ability to perform a behavior and manage its outcomes (Ajzen, 1991). This concept underscores the importance of perceived control over actions in influencing behavioral intentions. In the realm of e-commerce, perceived behavioral control can significantly impact users' intentions to adopt and engage with online shopping platforms. Ajzen's Theory of Planned Behavior posits that perceived behavioral control directly affects behavioral intentions and actual behavior. Taylor and Todd (1995) further explored this concept and found that perceived behavioral control is a crucial determinant of users' behavioral intentions across various contexts. Their study highlighted that when individuals believe they can control their actions, they are more likely to develop positive intentions toward engaging in those behaviors.

Mathieson (1991) also contributed to the understanding of perceived behavioral control by comparing it with other models in technology acceptance. His research affirmed that perceived control influences users' behavioral intentions, emphasizing that individuals' confidence in their ability to use technology affects their intention to adopt it. This finding is particularly relevant for e-commerce, where perceived behavioral control can shape users' willingness to engage in online transactions. Building on these insights, Venkatesh and Davis (2000) conducted a study on technology acceptance, demonstrating that perceived behavioral control significantly influences users' actual behavior in adopting e-commerce platforms. Their research revealed that individuals who perceive themselves as having control over their online shopping activities are more likely to transition from intention to actual usage of e-commerce platforms. This suggests that fostering a sense of control can enhance users' engagement with e-commerce.

In the context of e-commerce, perceived behavioral control plays a vital role in shaping users' intentions and behaviors. When users feel capable of managing their online shopping activities and outcomes, they are more likely to engage in e-commerce. This belief in control not only affects users' intentions but also their actual usage patterns, highlighting the importance of e-commerce platforms to supporting users in exercising control over their online activities. Given these findings, it is evident that perceived behavioral control is a significant factor influencing e-commerce intention. Thus, this study proposes the following hypothesis:

H4: Perceived behavioral control has a significant relationship with e-commerce intention.

Furthermore, the framework integrates TAM with additional components to provide a comprehensive understanding of factors influencing e-commerce intention. Figure 1 visually maps out how these elements interact and contribute to users' intentions to engage in e-commerce.

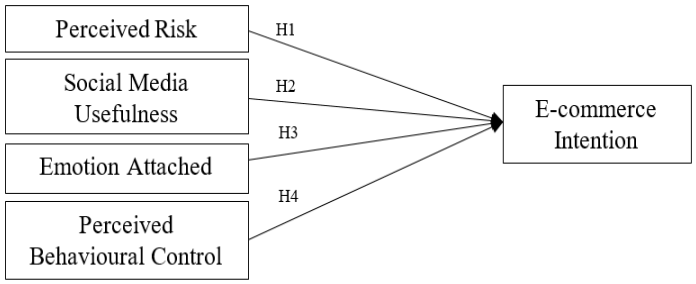

Figure 1: Research Framework

MATERIALS AND METHODS

This research employs a cross-sectional and quantitative research design, utilizing a convenience sampling method to investigate the associations among principal constructs. Cross-sectional surveys provide a momentary depiction of a population or phenomenon at a specific juncture (Cherry, 2022). The examination of the relationships between the constructs involved quantitative analysis. The determination of the sample size was performed utilizing G-Power software, which suggested a requirement of at least 146 participants for comprehensive analysis, with a power of 0.95 and an effect size of 0.15 (Faul et al., 2007). In a study by Reinartz et al. (2009), it was suggested that a sample size of at least 100 is preferable for conducting partial least squares structural equation modeling (PLS-SEM), as utilized in this research.

Through the use of a convenience sampling method, data collection was performed by distributing an online survey via WJX (http://www.wjx.cn/), a user-friendly platform. Furthermore, primary data were gathered from students at a private university in Shah Alam, Selangor, a cohort recognized for their extensive involvement in social media (Interdesly, 2012; Source et al., 2005). Out of the 500

questionnaires that were distributed, 278 were returned; nevertheless, only 256 responses were considered appropriate for analysis due to missing data. The application of PLS analysis was deemed appropriate, with Kline (1998) stating that a sample size ranging from 100 to 200 is suitable for this type of analysis. The study showed that 71.9% of the respondents were male and 28.1% were female. The distribution of ages demonstrated that 47.7% of the individuals surveyed were in the 21 to 23 years age bracket, with a Diploma (34.8%) being the most common educational qualification, followed by a Bachelor's Degree (33.2%).

Measuring Instrument

The questionnaire comprised both open and closed-ended questions, employing measurement methods such as the Likert scale, multiple choice, and ranking. Qualifying questions were included to ensure the relevance and appropriateness of participants. Informed consent was obtained from all respondents, detailing the research purpose, data usage, and withdrawal options. To address potential multicollinearity issues, the sample size was increased before data collection (Midi et al., 2010).

The questionnaire design was divided into two sections. The first section gathered demographic information, while the second section consisted of questions measuring respondents' e-commerce intentions and the factors influencing their use of e-commerce platforms. The questionnaire comprised 20 questions, using a 5-point Likert scale as recommended by Sekaran (2003). The items for this research questionnaire were adapted from previous literature, including perceived risk (Qi & Ploeger, 2001), social media usefulness (Davis, 1989), emotional attachment (Qi & Ploeger, 2001; Tommasetti et al., 2018), perceived behavioral control (Taylor & Todd, 1995), and e-commerce intention (Cheng et al., 2006). This structured approach ensured comprehensive data collection, providing robust insights into the factors determining e-commerce intentions among the respondents.

Data Analysis Tools

PLS-SEM is a potent methodology utilized for the identification of causal associations among constructs while maximizing the explained variance in dependent latent constructs (Hair et al., 2011). The selection of PLS-SEM over covariance-based SEM (CB-SEM) in this study was based on its robustness in dealing with non-normality and limited sample sizes, given the exploratory nature of the research. To validate the suitability of employing PLS-SEM, an online Web Power tool was utilized for the assessment of multivariate normality. This tool computed Mardia's coefficients for multivariate skewness and kurtosis, along with their respective p-values. The outcomes revealed p-values below 0.05 for both coefficients, thereby confirming a substantial multivariate non-normality. This validation supported the utilization of PLS-SEM, a variance-based estimation approach not dependent on multivariate normality assumptions (Hair et al., 2017).

The execution of PLS-SEM analysis adhered to the recommendations proposed by Hair et al. (2013), encompassing various crucial stages. Initially, internal consistency reliability was evaluated using composite reliability (CR), with values exceeding 0.70 indicating satisfactory reliability. This step ensured consistent measurement of constructs across diverse items. Subsequently, indicator reliability was examined through outer loadings, with values surpassing 0.70 considered adequate, affirming the reliability of indicators for their respective constructs. Discriminant validity was established through the Fornell-Larcker criterion, guaranteeing that each construct's Average Variance Extracted (AVE) exceeded the squared correlations with other constructs. This process guaranteed the distinctiveness of each construct within the model (Fornell & Larcker, 1981). Convergent validity was ascertained by AVE values surpassing 0.50, indicating constructs explain over half of the variance of their indicators, validating the representation of constructs by the indicators. Effect sizes (f2f^2f2) were computed to evaluate the influence of exogenous constructs on

endogenous constructs, with values of 0.02, 0.15, and 0.35 denoting small, medium, and large effects, respectively (Cohen, 1988). This step offers insights into the practical importance of relationships among constructs. Lastly, path coefficients were estimated, and their significance was determined through bootstrapping techniques, focusing on coefficients exceeding 1.96 at the 5% significance level, thereby confirming the strength and significance of hypothesized relationships in the model. These methodological procedures ensure a meticulous evaluation of the measurement and structural model, providing robust insights into the associations among constructs within this exploratory investigation. By utilizing PLS-SEM, the study effectively addresses the challenges posed by non-normal data and limited sample sizes, rendering it a fitting choice for the research objectives.

FINDINGS

Measurement model assessment

For this study, the analysis of these two convergent and discriminant validities is compulsory to ensure the model assessment is valid before confirming the hypotheses testing. For the convergent validity the composite reliability, the average variance extracted, and outer loading were measured. As a finding, this study discovered that outer loading for three items needs to be dropped due to low loading. However, after the second analysis, all the loading is above 0.5 and considered acceptable (Chin 1998).

Table 1: The result of the discriminant validity based Fornell-Larcker criterion

	ECI	**EA**	**PBC**	**PR**	**USE**
ECI	*0.705*				
EA	0.249	*0.784*			
PBC	0.431	0.120	*0.635*		
PR	0.283	0.087	0.305	*0.688*	
USE	0.316	0.054	0.348	*0.432*	*0.721*
Notes: e-commerce intention; EA= emotional attached; PBC=perceived behavioral control; PR=perceived risk; USE= usefulness; based on the table above, the italic font and bold values indicated that the values have a greater correlation as compared with other constructs, hence, it showed that the proposed model-based discriminant validity					

For the composite reliability, the values found for this study were above 0.7 (Ramayah et al 2018). Meanwhile, the average variance extracted is above 0.4. As stated by the previous study the average variance extracted above 0.4 are also can be acceptable (Fornell Larcker 1981). Besides, for the analysis discriminant validity is to identify whether each of the constructs can contribute to the uniqueness differs from other studies thus, making the study measurements uncorrelated to each other. Therefore, this study is based on the Fornell-Larcker criterion showed that the constructs are higher off-diagonal cross. Table 1 below shows the result of the discriminant validity.

Multicollinearity

Multicollinearity is one of the analyses to check whether the predictors in a model are correlated to each other. Failing to conduct the multicollinearity may affect the misleading interpretation of the analysis finding (Vatcheva, MinJae, McCormick, & Mohammad H. Rahbar, 2016). Therefore, the multicollinearity was accessed by using the variance inflation factor (VIF) range between 1.8 and 2.5 (Durbin & Watson 1951). Thus, for this study VIF result showed below 2.5 hence, the measurement selected is not exposed to multicollinearity. Therefore, this study was valid and acceptable.

Structural Model Assessment

Based on the path coefficient analysis, this study showed Figure 2 path coefficient and Table 2 summary of the path coefficient table below indicated that H2 social media usefulness was found significant with e-commerce intention with t statistics 2.268 (p=0.023).

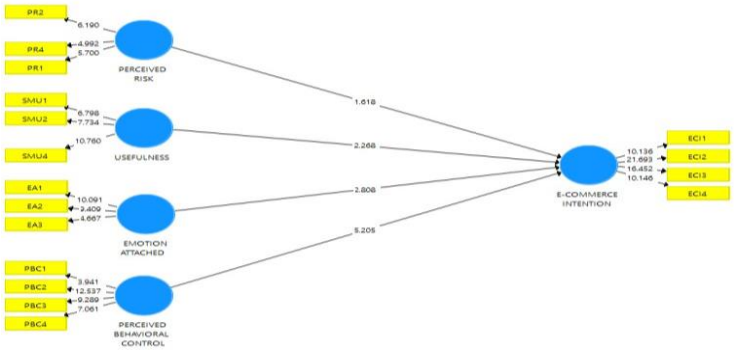

Figure 2: Path coefficient analysis

Besides, hypothesis H3 indicated that emotional attachment was found as a significant value with the t statistics of 2.808 (p=0.005). Meanwhile, H4 analysis with the relationship between perceived behavioral control and e-commerce intention was found a significant value with the result of t statistics 5.205 (p=0.000). However, the relationship of hypothesis H1 which is perceived risk with e-commerce intention found as not significant with the value of t statistics 1.618 (p=0.106).

DISCUSSION AND IMPLICATION

The present study focuses on factors affecting e-commerce intention among university students. The discussion of the major findings concluded that all hypotheses were supported and positive relationship. A conceptual model based on the theoretical fundamentals from empirical evidence or previous studies was proposed by integrating perceived risk, social media usefulness, emotion attached, and perceived behavior control in one single framework.

Table 2: The summary of the path coefficient analysis

Hypotheses	Path	R^2	T-Statistics	P-values	Results
H1	Perceived Risk → E-commerce Intention	0.264	1.618	0.106	Not Supported
H2	Social media Usefulness → E-commerce Intention		2.268	0.023	Supported
H3	Emotion Attached → E-commerce Intention		2.808	0.005	Supported
H4	Perceived Behavioral Control → E-commerce Intention		5.205	0.000	Supported
***p<.001, **p<.05, *p<.01					

The first factor of this study is perceived risk, surprisingly, the result also showed that there is no significant relationship between perceived risk and e-commerce intention. This suggests that contrary to expectations, an increased perception of risk is associated with a lower likelihood of engaging in e-commerce activities. Therefore, Kim et al. (2021) have also claimed that perceived risk is one of the significant factors that affect e-commerce intention.

Moreover, examining the factor of social media usefulness, a pivotal aspect in this study, the results illuminate a significant connection between social media usefulness and e-commerce intention. The findings highlight a positive relationship, indicating that individuals who perceive social media as beneficial in the context of online shopping are more likely to express a heightened intention to engage in e-commerce activities. The result is consistent with the research conducted by Kumah (2020), and Nur Zafirah (2021). This suggests that the perceived usefulness of social media platforms

for obtaining information, recommendations, or staying informed positively contributes to users' intentions to participate in online transactions.

This study delves into the factor of emotion attached, revealing a significant aspect in the context of e-commerce intention. The results illuminate a positive relationship between emotions and the intention to engage in e-commerce activities. This implies that a stronger emotional connection to the e-commerce process corresponds to a heightened inclination toward participating in online transactions. This finding underscores the importance of understanding the emotional dimensions of consumers' interactions with e-commerce platforms. Faisal (2022) also suggested that emotional attachment has a significant positive effect on e-commerce purchase intention.

Lastly, this research highlighted that perceived behavioral control has a strong influence on students' e-commerce intention. Regarding perceived behavioral control, the findings indicate that consumers choose to engage in e-commerce activities when they perceive a sense of control and confidence in their ability to navigate and execute transactions on the e-commerce platform. Salem (2020) and Huang, Makmor and Mohamad (2024) the study found the same result about e-commerce intention being influenced by perceived behavioral control. In conclusion, most of the independent factors and e-commerce intention improve the consumer's intention to use the website. Therefore, online platforms should focus on the technology and behavior for the process of e-commerce intention. Those consumers who have knowledge and information may benefit and stimulate them to use the platform future.

Theoretical Implications

The findings from this study offer several theoretical implications for understanding e-commerce intention among university students, particularly in relation to the Technology Acceptance Model (TAM). TAM traditionally emphasizes perceived ease of use and perceived usefulness as key determinants of technology acceptance. By integrating perceived risk, social media usefulness, emotional attachment, and perceived behavioral control into a unified framework, this study extends TAM's application.

The absence of a significant relationship between perceived risk and e-commerce intention challenges the traditional TAM perspective, suggesting that perceived risk may interact with perceived usefulness in more nuanced ways. Conversely, the significant role of social media usefulness aligns with TAM's focus on perceived usefulness, indicating that social media's value in providing information and recommendations plays a crucial role in shaping online shopping behaviors.

Additionally, the positive impact of emotional attachment on e-commerce intention highlights the importance of incorporating emotional dimensions into TAM, suggesting that users' emotional connections can significantly influence their technology adoption and use. The strong influence of perceived behavioral control further reinforces TAM's relevance by demonstrating that users' confidence in navigating e-commerce platforms is critical for their intention to engage in online transactions.

These findings not only support TAM's robustness but also suggest the need for an expanded framework that integrates cognitive, emotional, and social factors. This evolution of TAM could enhance its applicability across diverse technological contexts, offering a more comprehensive understanding of technology acceptance and user behavior.

Practical Implications

The practical implications of this study are significant for both e-commerce platforms and developers. For e-commerce platforms, the findings suggest a need to enhance the perceived usefulness of social media channels as part of their marketing and customer engagement strategies.

By leveraging social media to provide valuable information, recommendations, and interactive experiences, platforms can increase users' intentions to engage in e-commerce activities. Additionally, platforms should focus on fostering positive emotional connections with users, as emotional attachment has been shown to positively influence e-commerce intention. Implementing features that enhance user experience and build emotional rapport can drive higher engagement and satisfaction. The strong influence of perceived behavioral control indicates that e-commerce platforms should prioritize user-friendly interfaces and provide clear, accessible navigation options to bolster users' confidence and control over their online transactions. Overall, understanding these factors allows e-commerce platforms to design more effective strategies, optimize user experience, and ultimately increase adoption and usage of their services.

CONCLUSION

The current investigation delineates various constraints that necessitate consideration when interpreting the outcomes. Initially, the scope of the analysis was confined to college students, potentially limiting the transferability of the conclusions to other consumer cohorts. Distinct demographic categories, including professionals or elderly individuals, may exhibit disparate inclinations towards e-commerce owing to varied necessities, inclinations, and risk evaluations. Subsequent studies should thus encompass a wider array of consumer segments to ascertain the universality of the identified associations.

Moreover, the study's participant size of 280 individuals might curtail the extensiveness of the conclusions to the broader populace. A more substantial sample size would amplify the statistical potency of the evaluation, enhance the precision of the outcomes, and permit more resilient generalizations. Future investigations ought to strive towards augmenting the sample size to fortify the comprehensiveness of their conclusions and furnish a more thorough comprehension of e-commerce inclinations.

In conjunction with remedying these restrictions, forthcoming research endeavors could derive advantages from scrutinizing supplementary variables, such as cultural impacts or technological adeptness, to further clarify the determinants influencing e-commerce intentions. Investigating these facets amidst varied populations will aid in formulating a more intricate insight into the mechanisms at play.

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