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BUYING INTENTION THROUGH VIRTUAL REALITY SHOPPING PLATFORMS: EXAMINATION OF TECHNOLOGY ACCEPTANCE, SATISFACTION AND IMMERSIVE ENGAGEMENT DETERMINANTS

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ABSTRACT

Introduction/Main Objectives: This study delves into how technology acceptance (i.e., perceived ease of use and perceived usefulness) and immersive engagement determinants (i.e., perceived enjoyment, interactivity, and telepresence) influence the satisfaction and purchasing intentions of today's youth, specifically focusing on the moderating role of trust within the context of virtual reality (VR) platforms. **Background Problems:** The current literature has a limited understanding of users' adoption patterns of VR apps, the impact of VR on consumer behaviour, and the lack of knowledge among young consumers regarding the VR platform. **Novelty:** Previous studies did not consider trust as a moderator in the relationship between satisfaction and behavioural intention when using VR platforms. Moreover, the current research has extended multiple variables to explain user satisfaction and intention based on TAM. **Research Methods:** The research used a quantitative methodology based on survey data collected from young consumers in Sarawak, one of the Borneo region's states, who use VR platforms. A two-stage Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis was conducted using WarpPLS 8.0 software. **Finding/Results:** The finding indicated that satisfaction was positively correlated with perceived usefulness, perceived enjoyment, and telepresence. Besides, satisfaction was positively related to the intention to purchase. **Conclusion:** This study can guide practitioners in decision-making and serve as a reference for scholars conducting related research in the Borneo region.

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INTRODUCTION

Virtual reality (VR) technology, as elucidated by Jerald (2015), pertains to information technology facilitating the creation of a digital environment by computers, which users can interact with as if it were real. The graphical elements presented within this virtual realm are generated through sophisticated computer techniques, enabling users to engage with the depicted scenes (Alhalabi, 2016). Ludlow (2015) perceived virtual reality (VR) as a technology tool that many individuals have encountered through various activities like playing video games, watching 3D movies, experiencing simulations at museums, or using augmented reality travel apps on their mobile devices. Furthermore, VR technology has applications beyond entertainment, being used by many industries in various aspects and functions, including scientific research, training programmes for social skills, anxiety and related disorders treatment, physical rehabilitation in more professional settings, shopping, design, and many more (Carl et al., 2019; Howard, 2017; Howard & Gutworth, 2020; Kim & Ko, 2019; Xu et al., 2021). Modern VR technology aims to replace real-world sensory input with artificial stimuli using specialised equipment like data gloves, helmets, and input devices such as mice and keyboards, enabling users to immerse themselves in virtual environments and interact with them in real-time (Ding & Li, 2022).

Drawing from previous research conducted by Liu et al. (2021), it was discovered that VR technology has been integrated into online shopping, significantly impacting consumers' perceptions and purchasing behaviours. VR provides novel, engaging, and immersive methods to enhance the shopping journey; it offers round-the-clock accessibility without the temporal or spatial limitations of physical shopping environments (Branca et al., 2023). De Canio et al. (2021) further remarked that the emergence of virtual and augmented reality technologies has facilitated remote engagement with products and manufacturing facilities, irrespective of geographical boundaries. This accessibility has notably bolstered individuals' intentions to engage in purchasing activities. Additionally, Bao and Zhuang (2017) pointed out that the notable success of VR technology in recent years, together with its potential to increase consumers' purchase intentions, has encouraged many businesses to investigate its use in a variety of fields, including e-commerce.

The early stages of many VR apps have resulted in a limited understanding of user adoption patterns (Peukert et al., 2019; Azar & Tan, 2020). Furthermore, there has been little investigation into the effects of VR on consumer behaviour, the dynamics between consumers and retailers, and the overall shopping experience (Alkarney & Almakki, 2022). Moreover, Maloney et al. (2021) emphasised that a lack of knowledge about teenagers' experiences and understanding of this emerging online social space and social VR may lead to uncertainty in decision-making related to marketing strategy. Even though a great deal of research has been done on VR in various kinds of sectors, including education, tourism, and gaming (Luo et al., 2021; Radianti et al., 2020; Reer et al., 2022; Smutny, 2022; Talwar et al., 2022), previous studies have primarily focused on behavioural changes from the standpoint of attitude, joy, virtual reality marketing, or other factors that affect the intention to purchase (Ibrahim et al., 2023; Kang et al., 2020; Kiliç et al., 2021; Lo & Chen 2020; Park & Kim 2023; Yan et al., 2020). Moreover, Chin et al. (2023) investigated the intention to use VR technology in tourism activities in Sarawak. However, given the potential of the Borneo region, there has been limited focus on examining the behavioural

changes among young consumers to date. Furthermore, the acceptance level of VR among young consumers has yet to be fully explored because of the limited evidence available in the literature (Nazri et al., 2022; Wong et al., 2020). In addition, despite some research done on virtual reality, a comprehensive understanding of the variables influencing users' purchasing intentions remains elusive (Bleize & Antheunis, 2017).

In addition, the current study differs from the previous studies in a few significant ways. First of all, this study employed the Technology Acceptance Model (TAM) as the theoretical underpinning to investigate the proposed conceptual framework (comprising perceived ease of use, perceived usefulness, perceived enjoyment, interactivity, and telepresence) in relation to satisfaction and subsequent purchase intention among youths in Sarawak. There is a scarcity of literature analysing purchase intentions using VR technology through the lens of the Technology Acceptance Model (TAM), primarily because acceptance factors have been overlooked, especially in developing countries like Malaysia and specifically in regions such as Sarawak in Borneo. Secondly, Taherdoost (2018) mentioned that TAM theory researchers often focus on the inclusion of the cognitive and affective components of accepting technology. If an emotional aspect is included, it typically focuses on negative emotions. However, the acceptance of the new technology can also be significantly influenced by positive emotions.

Therefore, referring to the suggestion of Taherdoost (2018), the current study proposed several extended cognitive and emotional factors (perceived enjoyment, interactivity, telepresence, and satisfaction) that were missing in TAM theory to better explain the behavioural changes that occur after adopting a new technology. This is because the TAM theory has not accounted for the intrinsic motivations and emotional needs of human beings. Other than that, trust, as an important factor that can bridge and enhance the relationship between satisfaction and behavioural intention in technology studies (Ho et al., 2017, Liang et al., 2018), was not tested as a moderator between satisfaction and purchase intention by using VR technology previously. To recognise the significance of trust in studies related to technology, this research incorporated trust as a moderator variable to examine its moderating effect on the relationship of satisfaction and purchase intention by using VR technology.

Given the gaps identified across the literature, this study aims to explain young consumers' purchase intentions after incorporating VR technology, focusing on technology acceptance and immersive engagement determinants. The study also suggests integrating extended variables, specifically immersive engagement determinants, with various interactions into the Technology Acceptance Model (TAM) theory to elucidate the behavioural shifts observed in the youth during the current digital era. Regarding practical gaps, the purpose of this study is to give practitioners empirical evidence regarding the employment of VR technology in their companies. Therefore, we anticipate that the current study will add to the existing body of knowledge about consumers' intentions to purchase through VR platforms. Scholars may refer to the current research and tailor further research in VR technology based on users' perceptions and emotional factors. Additionally, this study will assist business owners and the relevant stakeholders in making informed decisions about adopting VR technology. It aims to provide valuable insights into how integrating VR can benefit their operations, not only in Sarawak but potentially across neighbouring countries like Indonesia and Brunei.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

1. Technology Acceptance Model

The Theory of Reasoned Action (TRA), first put forth by Fishbein and Ajzen (1975), served as the basis for the Technology Acceptance Model (TAM), which was developed to forecast the probability that people or organisations would accept new technologies (Davis et al., 1989). TAM was created by Davis (1989) and focuses on two key factors: perceived usefulness and perceived ease of use. It emphasises understanding attitudes, intentions, and beliefs from a social perspective (Waheed et al., 2021). According to Song and Kong (2017), two essential elements for examining computer acceptance behaviour are perceived usefulness and perceived ease of use. Many studies have found that the most important elements influencing users' intentions are perceived usefulness and perceived ease of use (Chuang, 2020).

Furthermore, TAM is an information system theory that motivates academics to explore the comprehension of technology acceptance and usage in diverse company activities (Van der Heijden et al., 2003). According to Shukla and Sharma (2018), TAM has proven to be useful in explaining the adoption of a variety of technologies, from software programmes to a wide range of online services. Additionally, TAM has been used in various fields, such as banking (Shah et al., 2019), online marketplaces (Lin & Kim, 2016), education (Mahomed et al., 2017), and tourism (Chuang, 2020; Kirillova & Chan, 2018). The impact of VR technology on young consumers' intention to purchase through VR platforms is examined in this study using the Technology Acceptance Model (TAM). Additionally, the moderating effect of trust on the relationship between consumer satisfaction and intention to purchase through VR platforms in Sarawak is also investigated.

2. Intention to Purchase

Purchase intention can be defined as a behaviour that reflects a consumer's willingness to make a purchase by expressing their desire to obtain goods and services (Qing & Jin, 2022). In the field of social psychology, purchase intention is thought to be the best indicator of consumer behaviour since it represents a person's indication of their propensity to make a purchase, irrespective of other relevant factors that may affect their choices and actions (Cham et al., 2023; Jiménez & San Martín, 2014; Lim et al., 2022). According to Martins et al. (2019), purchase intention serves as the basis for demonstrating purchasing behaviour. According to Lim et al. (2022), purchase intention can directly influence consumers' purchasing behaviour. Furthermore, marketing research has indicated that VR elicits positive emotions and engenders favourable consumer reactions, thereby influencing purchase intention (Martínez-Navarro et al., 2019; Pizzi et al., 2019). As highlighted by Hilken et al. (2022), VR experiences positively impact customer purchase intentions, particularly concerning tourist destinations.

3. Perceived Ease of Use

Memarzadeh et al. (2016) highlighted that perceived ease of use refers to an individual's belief in the simplicity of using a specific system. Some scholars have also proposed that individuals adopt new technologies based on their perception of both extrinsic benefits, such as usefulness and ease of use, as well as intrinsic benefits, like enjoyment and emotional satisfaction (Kim et al., 2016). Wilson et al. (2021) asserted that positive judgements arise when consumers or individuals perceive a new

technology or system to be easy to learn and understand, indicating that minimal time and effort will be required to comprehend how the technology or system operates.

According to Nadeem et al. (2020), perceived ease of use has been identified as a predictor of satisfaction. Furthermore, Islam (2023) clarified how attitudes toward an information system can be influenced by perceived ease of use, implying that users are satisfied when they find the system comfortable to use. According to Amin et al. (2014), customer satisfaction is greatly impacted by perceived ease of use. A system with a higher perceived ease of use is more likely to be adopted and maintained favourably by users, which increases their propensity to use or acquire the system (Erdogmus et al., 2021). Furthermore, Hammoud et al. (2018) emphasised that one of the most important variables in producing consumer satisfaction is perceived ease of use. Consequently, a hypothesis was developed as follows:

H1: Perceived ease of use has a positive and significant impact on youth's satisfaction.

4. Perceived Usefulness

Perceived usefulness, as described by Fadlan (2018), denotes a scenario in which technology usage leads to benefits for its users. It can also be defined as an individual's perception of whether new technology has the potential to enhance their business practices and overall performance (Ajzen, 1991; Eriksson et al., 2005; Jahangir & Begum, 2008; Rahman et al., 2017). This perception is intertwined with users' comprehensive evaluation of the VR experience and its efficacy in improving their shopping performance (Kim et al., 2021). TAM posits that individuals are more inclined to embrace new technology when they perceive it as requiring minimal effort and anticipate that it will enhance their work performance (Peñarroja et al., 2019). Consequently, the perceived usefulness of an information system can influence users' attitudes toward its adoption. On top of this, Nawi et al. (2022) asserted that users are more likely to adopt new technology when they perceive it as useful. Furthermore, prior research has consistently demonstrated that perceived usefulness is a significant and direct determinant of information system usage (Mouakket, 2015; Wu & Chen, 2017).

In addition, Danurwindo et al. (2021) underscored the impact of perceived usefulness on customer satisfaction. Within the realm of perceived usefulness, the overall utility emerges as a pivotal dimension in fostering satisfaction (Juntongjin, 2022). Numerous studies have consistently found this relationship, including topics like electronic textbooks (Stone & Baker-Eveleth, 2013), mobile banking (Yuan et al., 2016), mobile commerce (Luqman et al., 2016), and e-learning systems (Almahamid & Rub, 2011). Therefore, the proposed hypothesis is as follows:

H2: Perceived usefulness has a positive and significant impact on youth's satisfaction.

5. Perceived Enjoyment

Perceived enjoyment, as defined by Shuhaiber and Mashal (2019), refers to the extent to which individuals find the virtual environment within VR enjoyable or pleasurable. It often characterises the emotional response elicited by system usage and is defined as the extent to which the act of using a particular system is considered pleasurable, irrespective of any performance outcomes resulting from system use (Venkatesh, 2000). When mobile shopping apps are perceived as enjoyable, they can engender strong intrinsic motivation and positive attitudes towards the technology, consequently leading to a heightened intention to make purchases

through these apps (Patel et al., 2020). Furthermore, Basuki et al. (2022) indicated a positive relationship between users' comfort level with information technology and their attitude towards accepting the system technology.

Previous research (e.g., Venkatesh et al., 2002; Fagan et al., 2008; Venkatesh, 1999) has highlighted the importance of perceived enjoyment in forming positive views of technology. Prior studies have indicated that consumer behaviour and purchase intention are significantly influenced by perceived enjoyment (Chen et al., 2016; Jang & Park, 2019). Users of information systems are inclined to develop a positive attitude towards system usage when they perceive it as both useful and enjoyable (Lee, 2022). Moreover, perceived enjoyment also exerts a positive impact on satisfaction, as users experience positive emotions while engaging with their apps (Akdim et al., 2022). Another study has shown that shopping in a VR shopping mall via desktop leads to a significant increase in perceived enjoyment and perceived quality assurance, ultimately enhancing customer satisfaction (Lee & Chung, 2008). Therefore, we propose the following hypothesis:

H3: Perceived enjoyment has a positive and significant impact on youth's satisfaction.

6. Interactivity

Steuer (1992) defines interactivity in VR, from a human-computer interaction perspective, as the extent to which users can actively participate in altering the shape and content of a virtual environment in real-time. In this context, interactivity is closely related to the level of control and flexibility provided to users to shape their learning experience, which may involve the use of handheld controllers and a virtual body (Makransky & Petersen, 2021). In VR, interactivity manifests when the user's actions impact virtual objects or avatars, resulting in changes in the digital environment (Cham et al., 2022; Wang et al., 2021). Interactivity is also a key component of effective communication, marketing, advertising, e-commerce, and course management systems, according to information systems studies (Larsson, 2011; Lee et al., 2022).

Many studies have also demonstrated that interaction in online shopping channels has a positive impact on several factors, such as shopping involvement, approach intention (Kim et al., 2007), affective response, attitude toward the retailer (Lee et al., 2010), satisfaction (Ballantine, 2005), and purchase intention (Huang & Huang, 2013). Furthermore, Jevremović et al. (2022) claimed that satisfaction is one of the outcomes of interactivity. Furthermore, apps that offer increased interaction and communication tend to attract more customer engagement and participation, thereby enhancing customer satisfaction and highlighting the value they attribute to such apps (Lee et al., 2022). Hence, it can be deduced that interactivity influences consumers' satisfaction. Thus, the proposed hypothesis is as follows:

H4: Interactivity has a positive and significant impact on youth's satisfaction.

7. Telepresence

According to Steuer (1992), telepresence refers to the extent to which an individual feels physically present in a virtual environment, perceiving their presence as if they were actually in the physical world. It also represents a psychological state in which consumers feel fully immersed in a virtual shopping environment (Song et al., 2007). Telepresence entails the feeling of being immersed in a virtual environment; when users watch short videos, they experience a sense of immersion in the depicted scenes (Liu et al., 2023). Telepresence

is a critical component of VR (An et al., 2021; Dehghani et al., 2021) as it offers users the sensation of truly being present in a location that is separate from their physical surroundings in both time and space, along with a sense of detachment or disconnection from the real environment (Tussyadiah et al., 2018; Van Kerrebroeck et al., 2017).

Research has shown that consumers are more likely to engage in virtual shopping and demonstrate a stronger intention to purchase when they perceive a higher level of telepresence (Fortin & Dholakia, 2005; Wang et al., 2017). The perception of realistic features and environments in technology-mediated simulations contributes to the pleasure experienced by users during their interaction (Chung & Lee, 2023). Moreover, a high level of telepresence can lead to more convincing communication, which positively influences consumer attitudes and responses (Barnes, 2017; Klein, 1998). Previous studies have confirmed that telepresence is positively associated with a greater degree of satisfaction (Aebli et al., 2022). Thus, the proposed hypothesis is as follows:

H5: Telepresence has a positive and significant impact on youth's satisfaction.

8. Satisfaction

According to Kotler and Keller (2015), customer satisfaction refers to the emotional response that occurs when customers compare the perceived performance of a product or service with their expectations, leading to either contentment or disappointment. In other words, satisfaction is a pleasurable fulfilment of needs, goals, and desires experienced by a consumer. It reflects an individual's perception of whether their experience meets or exceeds their expectations, leading to a sense of favourability or unfavorability when comparing their experience with a standard after consumption (Chan et al. 2022). A company's ability to satisfy its clients is crucial to developing successful marketing campaigns that increase clientele and encourage the purchase of its goods and services. Satisfaction is crucial for understanding consumer intentions and actual usage (Chen & Cheng, 2009), as well as assessing the success of information systems (Zviran & Erlich, 2003). Lee (2020) further highlighted that the enhancement of purchase intention relies heavily on customer satisfaction. High levels of satisfaction can encourage users to embrace platforms, increase engagement, and foster intentions to make purchases (Attar et al., 2021).

Research conducted by Rhee and Lee (2021) found that customers who have engaged in virtual try-on of sneakers using AR-based Virtual Fitting (VF) are more likely to visit physical stores, and those who have experienced digital technology in retail stores specialising in sports products are expected to show positive purchase intentions. Besides, Kim and Lee (2011) articulated that the likelihood of a future purchase is determined by customer satisfaction, which also influences purchase intention. Bai et al. (2008) also suggested that the intention to purchase is positively and significantly affected by customer satisfaction. Therefore, the proposed hypothesis is as follows:

H6: Satisfaction has a positive and significant impact on youth's purchase intention.

9. Trust

Trust refers to the degree of willingness of an individual to place themselves in a vulnerable position with regard to the actions of another individual, based on the expectation that the latter will behave in a manner that is beneficial to them, regardless of the individual's ability to monitor or control the situation (Cham et al. 2024; Mayer et al., 1995). Customers' expectations of ongoing benefits, greater

satisfaction, loyalty, and less uncertainty about products are all included in the constructs of trust (Jiménez & San Martín, 2014; Loh et al., 2023; Moedeen et al., 2024). Trust is an important component that affects both traditional offline and online purchases, according to Rehman et al. (2019). Growing levels of trust are also believed to directly and favourably impact customer satisfaction, which can encourage the development of mutually beneficial relationships and open the door for users to accept and use the offered services and apps (Lacap et al., 2021; Taufiq-Hail et al., 2023).

In the past, trust has been utilised as a moderating variable in numerous consumer behaviour-related studies. For instance, trust positively amplifies the moderating effect of social influence on user behaviour (Davis et al., 2021). Additionally, trust plays a crucial role in moderating the association between social influence and online purchasing behaviour; higher levels of trust lead to increased consumer engagement and more frequent purchases on online shopping platforms (Putri et al., 2022). Furthermore, trust can promote risk-taking behaviour even in an uncertain situation, and due to this, trust has been seen as a key factor in customer retention (Fang et al., 2014). Trust is an important factor in the relationship between satisfaction and behavioural intention. Even if a consumer is satisfied with the purchase experience, the consumer might not be intent on repurchasing if there is a lack of trust in the seller (Ho et al. 2017). Liang et al. (2018) also found a positive and significant relationship between satisfaction, trust, and intention. Moreover, Teng and Wang (2015) also emphasised the crucial role of trust in promoting and influencing purchase intention. Other than that, Hidayat et al. (2021) also suggested that consumer purchase intention can be bolstered by consumer trust. Considering the ability of trust to have a close and positive relationship between satisfaction and intention and its ability to promote risk-taking behaviour, it is strongly believed that trust can enhance the relationship between satisfaction and purchase intention. Therefore, the proposed hypothesis can be expressed as follows:

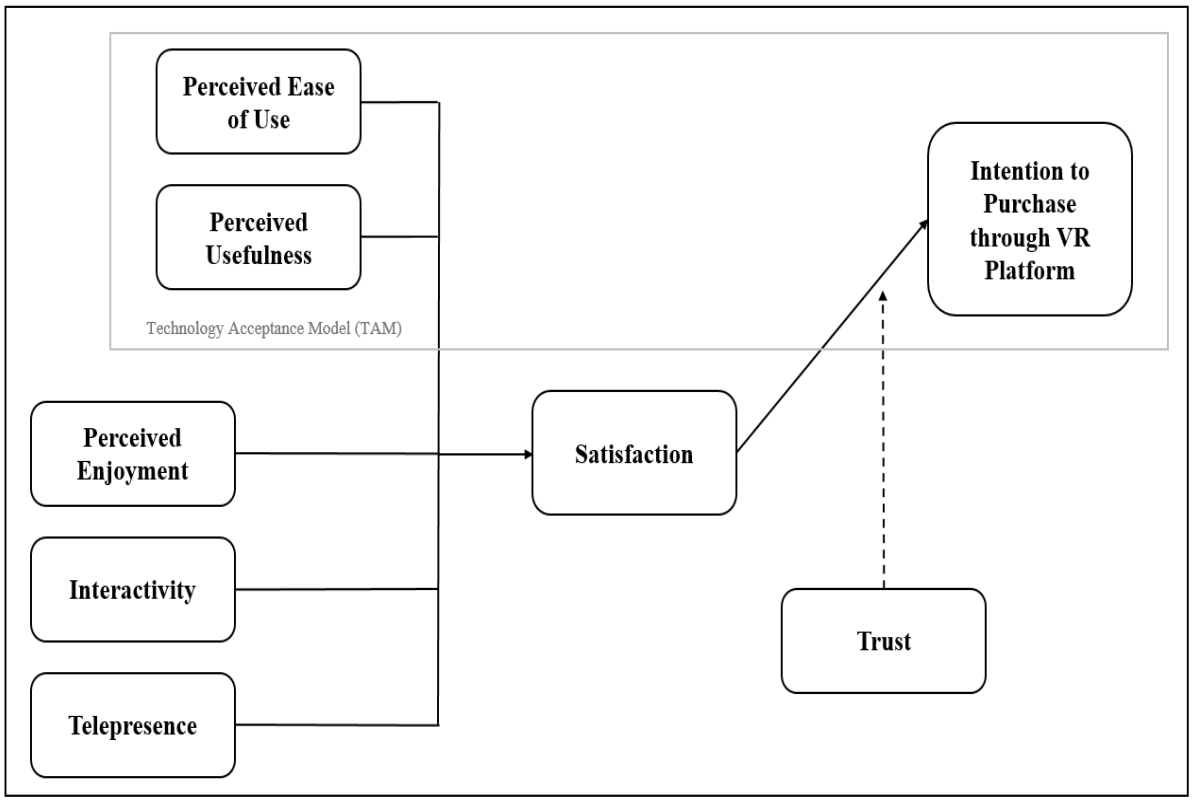
H7: Trust positively moderates the relationship between satisfaction and purchase intention.

From the literature review, a conceptual framework was formulated, drawing upon TAM as its theoretical underpinning (refer to Figure 1).

METHOD AND DATA ANALYSIS

Data collection was conducted in the top five major divisions by population within Sarawak, namely Kuching, Sibu, Miri, Samarahan, and Bintulu (Sarawak Government, 2021), over three months (July–September 2023). These divisions were selected strategically, considering the substantial youth population residing in these areas. Other than that, the current study employed a quantitative approach in collecting data by questionnaire. Subsequently, the G-power analysis programme (Erdfelder et al., 1996), a commonly utilised stand-alone tool for statistical power analysis in social and behavioural research, was utilised to determine the minimum required sample size for this study. Indeed, according to Cohen (1988), a statistical test ideally should have a power of at least 0.80, indicating that there is a high probability of detecting correlations between constructs in reality, especially when significant results are obtained. This level of statistical power ensures that the study can effectively detect true effects and minimise the risk of Type II errors, thereby enhancing the reliability and validity of the findings. The effect size is 0.35, the α error probability is 0.05, the power is 0.95, and the number of predictors is 7. The minimum sample size of the current study is 70.

Figure 1: The Proposed Conceptual Framework



To obtain reliable and justifiable data, the questionnaire was distributed to youth residing in five divisions of Sarawak via physically collecting the data at the major shopping malls of the divisions (Viva City in Kuching, Summer Mall in Samarahan, Wisma San Yan in Sibu, Parkcity Shopping Mall in Bintulu, and Bintang Megamall in Miri). The study employed a non-probability sampling method, specifically purposive sampling, to select participants. Purposive sampling involves selecting individuals based on specific criteria determined by the researcher's judgement (Berndt, 2020). In this case, the respondents are individuals aged 15 to 24 (Generation Z) residing in the previously mentioned divisions of Sarawak. The reason to choose young consumers in Gen Z is that the people born in this generation are born in an era permeated by information and communication technology (ICT), in which they adapt to any new technology quickly (Styloset al., 2021). By distributing the Google form-administered questionnaire together with a tablet and smartphone, the researcher physically collected data at the aforementioned research sites. In case of any technical issue with the ready devices, 50 printed copies of the questionnaire were prepared. All the respondents to the survey were assured of the privacy and confidentiality of the collected data, and they voluntarily participated in it.

The questionnaire comprises two sections. The first section collects demographic information such as age, place of residence, ethnicity of the respondents, and so on. The second section investigates the factors influencing youth's purchase intention when using VR platforms and their intention to make purchases through these platforms. The measurement items used in the questionnaire were adapted from

previous studies, with slight modifications to suit the Malaysian context. A total of 30 items were adapted from past studies; perceived ease of use - 4 items (Davis, 1989; Davis et al., 1989; Kim & Hall, 2019); perceived usefulness - 4 items (Erdogmus et al., 2021; Lim & Ting, 2012); perceived enjoyment - 4 items (Kim & Hall, 2019; Lowry et al., 2013; Lowry et al., 2015; Venkatesh et al., 2003); interactivity - 4 items (Wu, 2006; Wu et al., 2010); telepresence - 4 items (Jang et al., 2019; Ryu & Yu, 2016); satisfaction - 4 items (Kassim & Abdullah, 2008; Mofokeng, 2021);purchase intention - 3 items (Burner et al., 2001; Pookulangara et al., 2014); and trust - 3 items (Chu & Yuan, 2013).A filtering question has been included in the questionnaire to ensure that the respondents are from Sarawakwithin the age range of 15 to 24 years old. This step aims to enhance the relevance of the respondents and ensure the accuracy of the data collected for this study. A five-point Likert scale was adopted to measure the measurement items (Please find the measurement items in the appendix).

Out of the 158 questionnaires initially collected, 141 (89.24%) sets of data remained after removing responses with the issue of the straight-lining. It is worth noting that there were no missing values in the collected questionnaire due to the mandatory nature of all items in the Google Form, requiring respondents to answer all questions before submission. The analysis in the current study involved the use of two software tools: Statistical Package for Social Sciences (SPSS) version 23.0 and WarpPLS version 8.0. SPSS 23.0 was employed to conduct descriptive analysis and preliminary tests. Following this, WarpPLS 8.0 was utilised for a two-stage partial least squares structural equation modelling (PLS-SEM) analysis to validate and ensure the reliability of the constructs, as well as to evaluate the research model through path modelling (Abdi, 2003; Chin, 1998; Wold, 1985). In the subsequent section, the results obtained from this two-stage PLS-SEM analysis are presented.

RESULT AND DISCUSSION

1. Assessment of the Measurement Model

The measurement scale's discriminant validity, convergent validity, and reliability were evaluated using confirmatory factor analysis (CFA). To improve internal consistency, loadings below 0.5 were taken into consideration for elimination (Bagozzi et al., 1991). All loading values in this investigation were greater than 0.5, as shown in Table 1, meaning that none of the measurement items needed to be deleted. Chin (2010) suggested that composite reliability (CR) values should be at least 0.7 and average variance extracted (AVE) values with a cut-off of 0.5. Fornell and Larcker (1981) recommend that if an item's AVE is less than 0.5, it should be deleted. All CR and AVE values in this study met the minimum requirements. Cronbach's alpha is a measure used to assess the reliability of constructs, indicating how effectively a set of items or variables measures a single latent construct (Rahman et al., 2013). Generally, a Cronbach's alpha value exceeding 0.7 is considered reliable (Nunnally, 1967). All the Cronbach's alpha values of the current study have met the threshold, which is above 0.7. Hence, the findings of the current study are reliable, and convergent validity is achieved. Additionally, the discriminant validity of the measurement scales was reported following the HTMT criterion. The general rule is that values less than 0.90 are good and values less than 0.85 are best (Gold et al., 2001). All the HTMT values in the current investigation are less than 0.90 (see Table 1), suggesting that multi-collinearity is not an issue.

Table 1: Results of Measurement Model (Convergent and Discriminant Validity)

Construct	Items	Convergent Validity			Discriminant Validity (HTMT Criterion)							
		Loading	AVE	CR	PEU	PU	PE	I	TEL	SAT	INT	TR
Perceived Ease of Use (PEU)	PEU_1	0.769	0.629	0.871								
	PEU_2	0.771										
	PEU_3	0.801										
	PEU_4	0.831										
Perceived Usefulness (PU)	PU_1	0.814	0.711	0.908	0.683							
	PU_2	0.886										
	PU_3	0.845										
	PU_4	0.827										
Perceived Enjoyment (PE)	PE_1	0.881	0.782	0.935	0.638	0.840						
	PE_2	0.899										
	PE_3	0.871										
	PE_4	0.887										
Interactivity (I)	I_1	0.801	0.678	0.893	0.671	0.715	0.711					
	I_2	0.870										
	I_3	0.860										
	I_4	0.756										
Telepresence (TEL)	TEL_1	0.848	0.689	0.898	0.473	0.654	0.619	0.624				
	TEL_2	0.777										
	TEL_3	0.807										
	TEL_4	0.883										
Satisfaction (SAT)	SAT_1	0.867	0.766	0.929	0.588	0.801	0.827	0.702	0.798			
	SAT_2	0.896										
	SAT_3	0.875										
	SAT_4	0.862										
Intention to Purchase (INT)	INT_1	0.865	0.787	0.917	0.570	0.707	0.687	0.650	0.668	0.810		
	INT_2	0.905										
	INT_3	0.891										
Trust (TR)	TR_1	0.896	0.762	0.906	0.552	0.654	0.710	0.659	0.717	0.849	0.837	
	TR_2	0.895										
	TR_3	**0.826**										

Note: HTMT < 0.90 (Gold et al., 2001)

2. Assessment of the Structural Model

Satisfaction and intention to purchase, the endogenous latent variables in this study, had respective coefficients of determination (R^2) of 0.707 and 0.544. These R^2 values explain 70.7% and 54.4% of the constructions, respectively. R^2 values of 0.67, 0.33, and 0.19 typically represent significant, moderate, and weak coefficients of determination (Chin, 1998). In this study, these R^2 values are considered substantial and moderate, providing evidence of reliability, convergent validity, and discriminant validity.

When it came to hypothesis testing, a hypothesis was deemed fully supported if all of the important statistical tests associated with it were significant at $p \leq 0.05$. On the other hand, if all tests related to the hypothesis produced p-values higher than 0.05, the hypothesis was

deemed unsubstantiated (Cairo et al., 2020). The t-value must be greater than 1.645 to be considered statistically significant, and the p-value must not be greater than 0.05 to be accepted (Lee & Lim, 2021). Furthermore, effect size ($f2$) is also measured and reported in the following section because it provides a numerical measure indicating the extent of the difference between groups or the relationship between variables (Bakker et al., 2019). An effect size is classified as small if it is 0.02, medium if it is 0.15, and large if it is 0.35. (Cohen, 1992).

As shown in Table 2, the perceived usefulness is found to positively impact satisfaction (β=0.18; *p*=0.01; *t*=2.227); therefore, H2 was supported. Besides, perceived enjoyment is significantly and positively related to satisfaction (β=0.35; *p*<0.01; *t*=4.517); hence, H3 was supported, too. Apart from that, the results indicated that telepresence is positively and substantially associated with satisfaction (β=0.34; p<0.01; t=4.423), supporting H4. The last supported hypothesis is H6, suggesting that satisfaction is positively and significantly related to the intention to purchase (β=0.70; p<0.01; t=9.729). Surprisingly, H1, H4, and H7 were found to be unsupported. This means that perceived ease of use (β=0.01; p=0.44; t=0.163) and interactivity (β=0.10; p=0.11; t=1.234) are not impacting satisfaction, and trust (β=0.09; p=0.15; t=-1.056) does not moderate the relationship between satisfaction and intention to purchase. Besides, as for effect size, H1, H2, H4, and H7 have small effect size, H3 and H5 have medium effect size, whereas H6 has large effect size.

3. Discussion

The result of H1 indicates that perceived ease of use did not have a significant positive impact on youth's satisfaction; thus, H1 was not supported. This finding contradicts the results of Kashive and Powale (2021). Nevertheless, it is consistent with a prior study by Kenyta (2022) that investigated customers' satisfaction with mobile payment services in relation to perceived ease of use. The study discovered that even while the platform was challenging to use, consumers were nonetheless satisfied with the features offered, and that ease of use had no discernible impact on user satisfaction. This could be explained by the fact that the ease of use of VR platforms has no impact on users' satisfaction. Even if the VR platforms are challenging to navigate, users can still experience satisfaction due to the features provided. Perceived usefulness and satisfaction are positively correlated, according to H2. The result tallies with the previous research (Banu et al., 2019; Tandon et al., 2016). H3, which is perceived enjoyment, has a positive and

Table 2: The Results of Path Coefficient and Hypotheses Testing

Hypotheses	Standard Beta	P-value	t-value	Decision	$f2$
H1: Perceived Ease of Use → Satisfaction	0.014	0.435	0.163	Not Supported	**0.007**
H2: Perceived Usefulness → Satisfaction	0.180	**0.014**	**2.227**	**Supported**	**0.129**
H3: Perceived Enjoyment → Satisfaction	0.351	**<0.001**	**4.517**	**Supported**	**0.263**
H4: Interactivity → Satisfaction	0.102	0.110	1.234	Not Supported	**0.065**
H5: Telepresence → Satisfaction	0.344	**<0.001**	**4.423**	**Supported**	**0.243**
H6: Satisfaction → Intention to purchase	0.698	**<0.001**	**9.729**	**Supported**	**0.512**
H7: Trust → Satisfaction and Intention to purchase	**0.087**	**0.146**	**-1.056**	**Not Supported**	**0.032**

significant impact on satisfaction; as a result, H3 was also supported. This finding is concurrent with past studies (Esawe, 2022; Hsiao et al., 2016; Pereira & Tam, 2021).

The result of the hypothesis indicates that interactivity did not have a significant positive impact on youth's satisfaction, which can subsequently influence the intention to purchase through VR platforms. Therefore, H4 was not supported. This contradicts the suggestion made by Ballantine (2005). However, a similar result was revealed by Kim et al. (2021), who explored how interactivity and vividness influence the consumer virtual reality shopping experience. Their study mentioned that while interactivity in VR may be limited compared to the experience of physical stores, it still surpasses that of online platforms. While interactivity offers many benefits for improving engagement and user experiences in online systems, some users express dissatisfaction with the adoption and utilisation of existing systems (O'Brien et al., 2022). Therefore, a plausible explanation could be that users' satisfaction with VR platforms is not significantly influenced by interactivity compared to other factors such as perceived usefulness, which can affect user satisfaction. Additionally, it was found that telepresence is positively and substantially correlated with satisfaction, supporting H5, which is consistent with previous research findings (Kim & Ko, 2019; Yang et al., 2021). Furthermore, H6 was also supported, indicating that satisfaction is positively and significantly related to the intention to purchase. The result is similar to the recommendation of past studies (Bhattacharya & Sharma, 2022; Liao et al., 2022).

The H7 result indicates that trust did not have a significant positive moderating impact on the relationship between youth's satisfaction and the intention to purchase through VR platforms; therefore, H7 was not supported. This situation is plausible because consumers tend to place less emphasis on trust when it comes to experience-based processes. This outcome is consistent with the study by Liang et al. (2018), whereby it was found that transaction-based satisfaction and repurchase intention can be improved through the lens of trust but not experience-based satisfaction. Since VR platforms are so focused on the consumer's experience, trust is not a significant moderator in the case of this study. Consequently, it can be inferred that trust does not significantly strengthen the relationship between satisfaction and the intention to purchase through VR platforms. However, it can be reasonably argued that trust plays a pivotal role in establishing connections between customers and providers, fostering long-term relationships and brand loyalty (Saini & Khandelwal, 2019). This is because trust creates value for the customer, which facilitates loyalty development and encourages long-term commitment (Cardoso et al., 2022), rather than solely strengthening the relationship between satisfaction and purchase intention.

CONCLUSION AND RECOMMENDATIONS

1. Conclusion

In conclusion, this study provides empirical insights into the factors that influence youth satisfaction with virtual reality (VR) technology, thereby impacting their intention to purchase through VR platforms. The significance of this study extends to both theoretical and practical implications. Specifically, four hypotheses demonstrate a significant positive relationship: perceived usefulness to satisfaction, perceived enjoyment to satisfaction, telepresence to satisfaction, and satisfaction with the intention to purchase through VR platforms. These findings provide insightful information for scholars, decision-makers, and business professionals,

adding to the body of knowledge on the adoption of VR technology and consumer behaviour.

2. Implications

With an emphasis on the intention to purchase through virtual reality (VR) platforms, the findings of this research have important ramifications for both academic researchers and industry practitioners, especially in the fields of business and marketing. This study concentrates exclusively on Sarawak, which is located in the Borneo region; however, the respondents' technological usage patterns are generally consistent and profoundly embedded in their daily routines, especially for people from the same region. Consequently, the results can be extrapolated to populations of the same age cohort, irrespective of race, religion, or gender. This underscores the crucial role this research plays in steering Indonesia's digital economic progress, particularly in the provinces located in the Kalimantan region. By exploring the views of young people, this study adds to the literature on consumer behaviour through VR platforms and establishes a basis for future research in this field. Researchers interested in exploring the factors influencing youth's purchase intention through VR platforms can build upon the insights gained from this study. Besides, the inclusion of trust as a moderator in the research framework adds to the existing literature by suggesting that trust may not necessarily moderate the relationship between satisfaction and intention to purchase via VR platforms. This finding paves the way for future studies to delve deeper into the role of trust in consumer behaviour within virtual environments. Furthermore, this study contributes to the TAM theory by providing empirical evidence on the extended variables and different interactions between constructs, which helps better explain VR technology usage among young consumers and their purchase intentions.

The practical implications of this study are significant for policymakers, business stakeholders, and VR technology developers. On one hand, this study is expected to significantly contribute to Sarawak's Post-COVID Development Strategy 2030 by offering empirical evidence and theoretical insights to enhance digital transformation. On the other hand, its findings may serve as a reference for other countries within the Borneo region, such as Indonesia and Brunei, which are also prioritising digitalisation initiatives. Such exploration has the potential to promote technology transfer and highly skilled manpower movement, which could positively impact the region's economic performance. This study emphasises the importance of combining VR technology and user satisfaction to drive the intention to make purchases through VR platforms. Policymakers can use these insights to inform regulations and initiatives aimed at promoting the adoption and use of VR technology in consumer contexts. For businesses and VR technology developers, understanding the factors that influence user satisfaction and purchase intention through VR platforms is crucial. By strategically implementing or modifying VR technology to enhance user satisfaction, businesses can increase their competitiveness and attractiveness to consumers. This may involve focusing on aspects of enjoyment, such as playfulness, within the VR experience to create a more engaging and satisfying user experience. Overall, this study highlights the importance of considering user satisfaction and intention to purchase when designing and implementing VR technology. By prioritising user needs and preferences, businesses and policymakers can maximise the potential of VR technology to enhance consumer

experiences and drive purchasing behaviour in virtual environments.

3. Limitations and Recommendations

The current study is limited in its ability to collect diverse data from youth in the Borneo region. Constraints at the research site have resulted in a lack of data from countries on other continents. Furthermore, the study focuses solely on Sarawak's youth, and opinions from different ages may differ. As a result, the study's findings are limited to the youth demographic. Given the limitations mentioned, it is recommended that future research include data from countries on other continents, such as the United States of America, China, Saudi Arabia, Brazil, and so on, to ensure a diverse dataset reflecting the cultural backgrounds of various countries. Moreover, future studies are recommended to include individuals from different age groups, which could provide a broader perspective, which would provide scholars and practitioners with a more comprehensive understanding of the use of VR platforms from different generation cohorts and regions.

4. Relevance and Implication to Indonesian Context

Although this study was conducted among young consumers in the island of Borneo (Sarawak), its findings are highly relevant to the Indonesian context. Malaysia and Indonesia are neighbouring countries that share comparable sociocultural characteristics, a youthful population, and rapidly expanding digital and immersive technology markets, particularly in the gaming, education, tourism, and retail sectors. The study highlights the importance of technology acceptance factors (perceived usefulness and ease of use) and immersive engagement elements (perceived enjoyment and telepresence) in shaping user satisfaction and purchase intentions on virtual reality (VR) platforms, with trust playing a critical moderating role. These insights are especially imperative for Indonesia, where VR adoption is still in the emerging stage and user trust remains a key challenge in the technology adoption. By emphasising the role of satisfaction as a mediator between immersive VR experiences and purchase intention, this study could potentially offer practical guidelines for Indonesian VR developers, marketers, policy-makers, and relevant stakeholders to design more engaging, trustworthy, and user-centred VR platforms, thereby accelerating digital innovation and strengthening consumer adoption in Indonesia’s growing immersive technology ecosystem.

In the Indonesian context, perceived enjoyment is particularly noticeable due to the country’s strong youth driven digital culture, where hedonic motivation has been shown to significantly influence engagement with emerging digital technologies (Nugroho, 2025; Zulkifli et. al., 2024). As VR adoption in Indonesia is still nascent (Wisnuseputro & Dellyana, 2025), enjoyable and emotionally engaging VR experiences through providing multi-sensory experience can reduce users’ uncertainty (Sun et. al., 2022), thereby encouraging initial trial and continued usage.

Similarly, trust plays a critical role in shaping technology adoption in Indonesia, where concerns related to system reliability, privacy, and perceived risk continue to hinder user acceptance. Prior studies on digital services in Indonesia consistently identify trust as a key determinant of behavioral intention and sustained usage, with low trust contributing directly to technology rejection (Ibrahim et al., 2023; Fajri et al., 2024). Accordingly, the moderating role of trust identified in the Malaysian context is highly transferable to

Indonesia, where strengthening trustworthy VR ecosystems is essential for enhancing user confidence and accelerating adoption.

Comparative analyses of the digital ecosystems of Malaysia and Indonesia further support the applicability of this study's findings. Evidence from cross-country research shows that both Indonesia and Malaysia have experienced growing digital connectivity and ICT integration efforts, with Indonesia expanding digital readiness through inclusive internet initiatives and Malaysia leveraging telecentres and nationwide ICT programmes to bridge rural-urban divides (Haron et al., 2023). This shared trajectory toward a more digitally embedded society indicates that young digital natives in both countries are engaging more with online environments, a trend reflected in preferences for digital platforms when fulfilling socio-economic and religious roles (e.g., digital Zakat services) among young Muslim populations (Ghofar et al., 2024). Although Malaysia currently maintains a higher level of infrastructure and internet service stability compared to Indonesia, the social influence and trust drivers affecting digital platform preferences are salient in both contexts, reinforcing the relevance of immersive technology acceptance and trust-based engagement mechanisms across markets. These similarities provide a strong empirical basis for extending the insights derived from Sarawak to the broader Indonesian VR landscape.

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Appendix: Constructs and Measurement items

Measurement items	Sources
Perceived Ease of Use	
i. It is easy for me to understand how to manipulate tourism-related VR activity. ii. Using the tourism-related VR activity does not require a lot of mental effort. iii. I think that using the tourism-related VR activity is simple. iv. I find that it is easy to get what I want when I am using the tourism-related VR activity.	Davis et al. (1989); Kim and Hall (2019)
Perceived Usefulness	
i. When I shop online through the VR platforms, I can accomplish my shopping goals much faster. ii. When I shop online through a VR platform, I can improve my shopping performance (e.g., save time or money). iii. I find the VR platforms of online retailers to be helpful with my purchasing decisions. iv. Buying from online retailers through VR platforms has improved my purchasing decisions.	Erdogmus et al. (2021); Lim and Ting (2012)
Perceived Enjoyment	
i. Using related VR activities is very enjoyable for me. ii. Using related VR activities is pleasurable for me. iii. Using related VR activities is fun for me. iv. Using related VR activities makes me happy.	Lowry et al. (2015); Venkatesh et al. (2003)
Interactivity	
i. I had some control over the content of this virtual reality site that I would like to see. ii. I can control the pace at which I visit this virtual reality site. iii. I control my navigation on this virtual reality site. iv. The virtual reality site seems to be talking to me when I click on it.	Wu, 2006; Wu et al., 2010
Telepresence	
i. While using the VR site, I felt like I was in the store. ii. When using a VR site, I felt that the visible scene was part of the actual store. iii. While using the VR store, I felt like I could touch the products and things in the store. iv. When I used the VR site, I felt that the things in the VR sites were real.	Jang et al. (2019); Ryu and Yu (2016)
Satisfaction	
i. I am generally pleased with this virtual online service. ii. The virtual site of this online company is enjoyable. iii. I am generally satisfied with the virtual online service of this company. iv. I am generally happy with this virtual online company.	Kassim and Abdullah (2008); Mofokeng, (2021)
Purchase Intention	
i. I intend to buy from a virtual site within the next 3 months. ii. I intend to buy from this virtual site. iii. I will continue to use this virtual site for shopping in the future.	Burner et al. (2001); Pookulangara et al. (2014)
Trust	
i. I can trust this virtual site. ii. I trust the information presented on this virtual site. iii. I feel this virtual online vendor would provide me with good service.	Chu and Yuan (2013)