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Title : Examining Virtual Reality and User-Generated Content Impact on
Purchase Intentions in Brand Marketing:
Based on Stimulus-Organism-Response model

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Abstract

Nowadays in marketing industry, virtual reality (VR) and user-generated content (UGC) have become powerful tools, each enhancing consumer engagement in unique ways. VR provides an immersive experience, while UGC provides authenticity through consumer interaction. However, there are still few comparative studies on their impact on purchase intention. This study aims to explore the impact of the common technological experience and content quality of VR and UGC on consumers' cognitive and emotional responses through immersion, and how these responses affect purchase intentions. This study utilizes the stimulus-organism-response (SOR) model to examine the relative validity of these marketing tools. Through an experimental design involving 188 participants exposed to Wendy's marketing stimuli, we explored how immersion, content quality, and technical experience influence cognitive and emotional responses, ultimately affecting purchase intentions. Our findings reveal that both VR and UGC content quality significantly enhance cognitive and emotional responses, leading to increased purchase intention. While VR excels in immersion and emotional response, UGC performs better in social response. Interestingly, immersion alone does not directly influence purchase intention. This research sheds light on the effectiveness of VR and UGC in driving consumer behavior, suggesting VR's potential dominance in future marketing strategies. Marketers can use these insights to leverage emerging technologies and enhance consumer engagement.



Keyword : Virtual reality, User-generated content, immersion, purchase intention

Table of Content

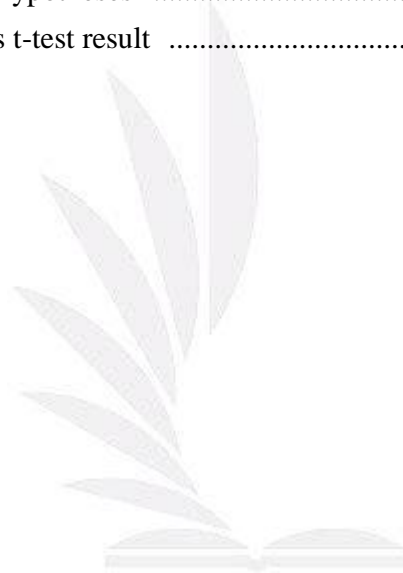
List of Figures.....	3
List of Tables.....	3
1. Introduction	4
2. Literature review	5
2.1 Importance of virtual reality marketing and user-generated content marketing.	5
2.2 Stimulus-organism-response framework	6
2.2.1 Technology and Content factors as environmental stimuli (S)	7
2.2.2 Cognition and emotional responses as customer internal states (O)	8
2.2.3 Purchase intention as response (R)	8
2.3 Immersive presence through virtual reality	8
2.4 The interaction between UGC addiction and immersion, flow, and belongingness	9
3. Hypotheses development and research model	11
3.1 Effects of VR and UGC technology on immersion	11
3.2 Effects of VR and UGC content on immersion	12
3.3 Effects of immersion on emotional reaction and social interaction	12
3.4 Effects of emotional reaction and social interaction on purchase intention	13
3.5 Effects of immersion on purchase intention	14
4. Methods	15
4.1 Subjects and procedures	15
4.2 Measures	16
5. Data analysis and results	17
5.1 Exploratory factor analysis (EFA)	17
5.2 Confirmatory factor analysis (CFA)	18
5.3 Hierarchical moderated regression analysis	19
5.4 Independent samples t-test	21
6. Discussion	23
6.1 Formation of purchase intention and influencing factors	23
6.2 Comparative analysis of VR and UGC factors	24
7. Limitations and future research	25
References	26
Appendix 1 & 2	40

List of Figures

Figure 1. Stimulus-organism-response framework	7
Figure 2. Research framework	15

List of Tables

Table 1. Exploratory factor analysis result	18
Table 2. Confirmatory factor analysis result	19
Table 3. Hierarchical moderated regression analysis result	20
Table 4. Empirical results of hypotheses	21
Table 5. Independent samples t-test result	22



Chapter 1 Introduction

In marketing, Virtual Reality (VR) and User-Generated Content (UGC) have been identified as powerful tools, each offering unique ways to engage consumers. VR, when introduced was treated as an artificial environment for use of users. However, it later emerged as a universal technology that most industries have embraced (Milgram et al., 1994). In marketing, VR is highly recognized (Loureiro et al., 2019) since it can allow the customization of customer experience whereby it can be used for experiential marketing (Jung et al., 2016). Recent studies have showed that this VR marketing strategies, including branded VR campaigns, are among the most potent tools (Wang & Chen, 2019). For instance, it was established that product placement within VR videos is essential in increasing the will to purchase the brand (Kang, 2020).

On the other hand, the UGC, a brand related content created by users on social media, is valued and alleged to be genuine information; hence, the brand engagement is at its uppermost level (Tirunillai & Tellis, 2012). In marketing, it has proved to have an enormous rise in published studies and applications, business media, such as Forbes and Adweek claiming that this form of the tool for marketing is an asset to covert marketing tool (Olenski, 2017; Merckel, 2017). It significantly impacts brand perceptions, purchase intentions, and sales (De Vries et al., 2012; Jin et al., 2014; Naylor et al., 2012). This means that it is more probable for companies to engage in the interactive use of UGC to raise product awareness (“Taylor,” 2023).

Despite the extensive research on each tool individually, there is a notable lack of comparative studies between VR and UGC in marketing. This gap in the literature raises questions about the future dominance of these tools as technology advances. Will UGC be surpassed by VR as the dominant marketing tool in the future? To explore this, this study proposes to compare the effects of VR and UGC on cognition and emotional responses, based on the Stimulus-Organism-Response (SOR) theory.

The SOR theory, originating from Thorndike's stimulus-response theory in 1905 (“Jiyani,” 2023), suggested that people respond to environments in two approaches: approach behaviors (i.e. positive actions like exploration and engagement) and avoidance behaviors (i.e. reluctance to engage) (Mehrabian and Russell, 1974). Literally, in the context of both VR and UGC, the two tools developed immersion. This study uses immersion under the SOR framework toward deciphering some insights about the future marketing trends or the dominance of VR over UGC.

The current study will examine how VR and UGC stimulation influence cognitive and affective response, and the processes by which these responses influence consumer purchase intentions. This study aims to integrate these forms of presence through an innovative experiment to conduct an in-depth comparison of the processes by which VR and UGC influence consumer purchase intention. Through these comparisons,

examine the effects, advantages, and disadvantages of VR and UGC in marketing, while understanding their impact and development on future marketing strategies.

Chapter 2 Literature Review

2.1 Importance of virtual reality marketing and user-generated content marketing

It is thus that VR and UGC have come about as a powerful marketing tool that provides unique opportunities for customers to get engaged with the use of the product. Though VR was initially developed as an artificial environment for its users, now it has proved to be a pretty versatile technology and is utilized in different sectors of human life. (Milgram et al., 1994). UGC, as a brand-related form of content made by users on social media platforms and released through blogs, reviews, and other means, is highly authentic and, thus, used to enhance brand engagement (Tirunillai & Tellis, 2012).

In recent years, there has been increased attention given to thesis writing in the VR literature. VR has also seen a burgeoning of applications in various fields such as architectural planning (Dorta & Pérez, 2006; Schnabel et al., 2001), rehabilitation medicine and health (Gourlay et al., 2000; Rizzo et al., 2011), military applications (Manojlovich et al., 2003), industrial applications (Wang & Li, 2004), and commerce (Krasnikolakis et al., 2014; van Herpen et al., 2016), among others. Studies have suggested that due to its ability to enhance customer experiences (Jung et al., 2016), virtual reality is seen as an ideal platform for experiential marketing (Loureiro et al., 2019). Based on the above empirical evidence by recent VR marketing research, VR marketing is generally effective. Wang and Chen (2019) discovered that the use of VR videos in placing a product in content increases interest in the brand of the other leftover product as well as the intention to purchase. Similar results were found by Kang (2020), who reported that the main value of VR applications in digital shopping is that it allows consumers to look at the products by having a glance in a natural 3D space where the visuals contain a remarkable amount of information.

Many companies have already found the potential of VR in marketing and are integrating VR into their marketing strategies, using tactics like branded VR campaign, yielding positive outcomes. For example, Adidas offers a VR experience featuring NBA player James Harden at their flagship store in New York, enhancing the shopping experience for customers (“Alvares,” 2016). Similarly, The North Face uses VR to immerse consumers in the brand's lifestyle, creating a deeper connection with the brand (“Mandelbaum,” 2015). With VR technology advancing rapidly, The Goldman Sachs Group predicts that the market value of VR branded content will hit \$80 billion by 2025, signaling a major shift in consumer, brand, and retailer interactions.

Furthermore, UGC marketing has also seen a dramatic increase in publications and applications over the last few years. Business media, such as Forbes (Olenski, 2017) or

Adweek (Merckel, 2017), praise it as a highly advantageous covert marketing tool because it blends seamlessly into regular social media content, making it harder for us to spot advertising. Adweek also suggested that UGC is not only much more effective, but it is also much cheaper to implement than other marketing tools. According to the MIT Sloan Management Review, businesses are urged to redefine their social media marketing goals to incorporate brand engagement, with customer-posted sponsored content considered a return-on-investment metric (Hoffman & Fodor, 2010).

Previous research indicates that UGC significantly impacts brand perceptions, purchase intents, and sales (De Vries et al., 2012; Jin et al., 2014; Naylor et al., 2012). Brands nowadays are increasingly leveraging UGC to interact with their customers, increase product awareness, and drive purchasing behavior. For instance, Cosmetics powerhouse Sephora's Community Gallery, which showcases UGC in an engaging, visually appealing format, includes text threads, groups, and interactive elements that allow users to engage with one another ("Taylor," 2023).

Although numerous studies have demonstrated the influence of brand-related UGC on consumer behavior, there is currently a lack of research comparing this well-established and extensively studied marketing tool with the emerging technology of VR in marketing. This paper aims to address this gap by comparing the effects of VR and UGC on cognition and emotional responses with the Stimulus-Organism-Response (SOR) theory. In this regard, this would help to understand how these effects eventually affect the consumer's purchase intention to establish whether VR has the potential to overtake UGC as the primary marketing channel in the future.

2.2 Stimulus-organism-response framework

The SOR theory was based on Edward Thorndike's stimulus-response theory in 1905 ("Jiyani," 2023). According to this theory, an individual's behavior toward an object is determined by the consequence of their acts. Later, Mehrabian and Russell (1974) expanded on this idea by introducing the notion of an organism between the stimulus and the response, creating the modern SOR theory (Figure 1). According to the SOR theory, individuals respond to environments in two main ways: approach behaviors involve positive actions like exploration, engagement, affiliation, or work, while avoidance behaviors involve the opposite, such as a reluctance to positively engage (Mehrabian and Russell, 1974). In other words, the framework suggests that environmental cues (stimulus) perceived by an individual can influence their internal state (organism), leading to positive or negative behaviors (response) towards those stimuli (Mehrabian and Russell, 1974).

The SOR theory has been applied to various contexts involving innovative technologies, such as impulsive buying behavior in mobile auctions (Chen & Yao, 2018), customer engagement with online brand community characteristics (Islam &

Rahman, 2017), co-creation in social media communities (Kamboj et al., 2018), online shopping behavior (Peng & Kim, 2014), and customer loyalty in online social commerce (Wu & Li, 2018). In the context of VR marketing, Kim et al. (2018) used the extended SOR model, using real experiences as stimuli and cognitive and emotional responses as organisms to investigate the final consumer's attachment and visit intention after using VR to explore the tourism industry. Similarly, several studies examined consumer behavior in UGC social environments using the SOR theory (Tian et al., 2022; Sohaib et al., 2022; Wu & Li, 2018). These applications demonstrate the versatility and applicability of the SOR framework in understanding consumer responses to stimuli in various technological contexts. This paper primarily aims to utilize SOR theory to understand the impact that VR and UGC stimuli can create on consumers concerning purchase intention in different environments and thereby enable us to understand better modern marketing strategies.

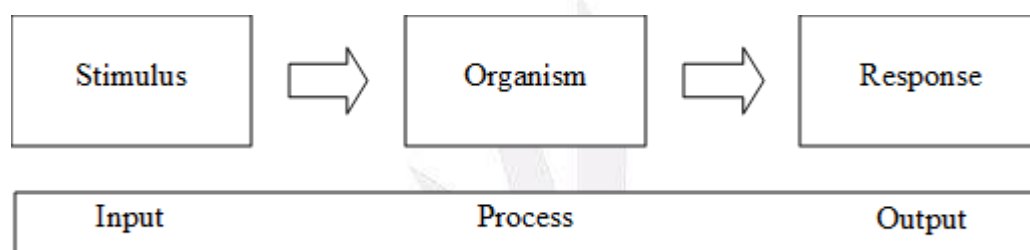


Figure 1. Stimulus-organism-response framework

2.2.1 Technology and Content factors as environmental stimuli (S)

In this study, two significant environmental stimuli that shape the behavior of consumers are technology and content quality. Min and Tan (2022) highlighted the importance of technological systems and service quality in shaping shopping participation, particularly in mobile formats and live streaming commerce. They further argue that both the qualities of the system and the services are of great importance, more significantly, in mobile shopping. Meanwhile, Shi, Chen, and Chow (2016) identified that customers pay attention to the up-to-date of the information placed on brand pages, making the timeliness and relevance of content serve as stimuli to engage consumers.

Regarding content quality, Arif et al. (2020) and Carlson et al. (2018) emphasized the evaluation of content in various aspects, such as timeliness, sufficiency, relevance, and completeness. They found that attractive and appealing content to the audience can allure customer attention about the brand and raise their trust. Furthermore, Nambisan and Baron (2009) and O'Cass and Carlson (2012) identified content quality as a stimulus that determines online customer behavior. It is postulated that if the content is high-quality, then it may bring positive effects on customer perceptions and consequently on customer behaviors and thus may alter their purchase intention.

In this sense, it is suggested that the primary and most pivotal stimuli of the environment influencing consumers are technology and quality content. On that account, marketers need to concentrate their efforts on high-quality technological systems and services with the addition of rich and relevant content, which would help to stimulate consumers and increase their purchase intention.

2.2.2 Cognition and emotional responses as customer internal states (O)

In the SOR model, organism is the individual's internal state, which may be either cognitive reactions or affective reactions. (Lee & Chen, 2022). These internal states serve as mediators linking the external stimuli and behavioral responses (Chang & Chen, 2008). Cognitive reactions involve the processing of existing information (Fang, 2014), while affective reactions relate to individuals' feelings or emotions, such as satisfaction and happiness (Kamboj et al., 2018).

According to Chen and Yao (2018) impulsiveness refers to the psychological organism directly seeking a response, and consumers who tend to be impulsive buying are more likely to make impulsive buying behaviors. They further argue that internal psychological factors, such as perceived usefulness (i.e. cognitive reaction), perceived enjoyment (i.e. affective reaction), and the urge to buy impulsively, influence final impulse buying behavior.

In the context of this study, we define cognitive and emotional responses as critical internal states configuring the stimuli-organism-response relationship. These internal states are critical to form consumer behavior, which will be the focus of the virtual reality and UGC stimuli context.

2.2.3 Purchase intention as response (R)

In the SOR model, responses mean the final outcomes and decisions made by users based on their cognitive and affective responses, which can show as behaviors of approach or avoidance (Sherman et al., 1997). In particular, the purchase decision is a significant behavioral outcome (Yadav et al., 2013). On the other hand, purchase intention reflects consumers' subjective tendency to buy products and serves as a key indicator of consumer behavior (Hill, 1975). While purchase intention has been extensively studied in the literature (Ali et al., 2015; Ryu et al., 2012), Ali (2016) and Ahmad et al. (2018) have both considered purchase intention as a response factor within the SOR framework. Therefore, based on the above literature review, we can understand that purchase intention is a crucial response factor (R) for consumers.

2.3 Immersive presence through virtual reality

Virtual Reality (VR) has the unique ability to create a sense of presence, which is the feeling of "being there" in a computer-generated environment (Biocca, 1992). This sense of presence is a central concept of VR research, focusing on the user's subjective

experience of feeling in the virtual environment while physically located elsewhere (Witmer & Singer, 1998).

Virtual presence or telepresence, also internet presence, refers to a psychological condition in which a subject perceives itself to be present in an environment since the presence of ourselves is created through the means of a medium (Beck et al., 2019; Nash et al., 2000; Schuemie et al., 2001; Schultze, 2010; Slater et al., 1994; Tussyadiah et al., 2018). In more technical terms, it refers to merging between the virtual world where the individual is but the real world where the individual belongs. Presence results from psychological, cognitive, and perceptual immersion, whereas immersion is an objective and technical aspect of the virtual environment (Mestre et al., 2006). In its native state it describes the "presence" that we referred to, although it often used interchangeably with "immersion" (McGloin et al., 2013). On the scholarship around virtual reality, these are the two key concepts that help us get a better sense of what it means to face virtual environments (Blackman, 2022). It implies the degree where virtual being induces the feeling of presence and the extent to which the virtual self-responds to sensory stimuli as if they were real (Milgram et al., 1994; Sanchez-Vives & Slater, 2005). Although the understanding of what is required for a robust sense of presence in VR has been the focus of recent investigations aimed at how immersion manifests, and the impact it has on human behavior. It has been found that presence might be dependent on factors like the level of interactivity, realism and vividness of the virtual environment (Steuer, 1992). Generally followed by immersion and presence as interchangeable (Blackman, 2022).

Theoretical dimensions of presence, however, have lagged the technological developments (North & North, 2016). Recent research argues a different view on presence with this focus on telepresence alone, suggesting that telepresence might represent an oversimplistic understanding of presence, because other display types merge the real and the virtual world to display parts of the virtual environment in the real world space of the user. (Lombard & Ditton, 1997; Loomis, 1992; Steuer, 1992). Besides, the influence of presence on real-world performance has not yet been fully explored, particularly for context-specific immersive stimuli (Marasco et al., 2018; Stevens & Kincaid, 2015; Suh & Prophet, 2018).

As much as significant headway has been made in our comprehension of the role of presence in VR, the same cannot be said of immersion in VR impacting individual purchase intention within the SOR framework. The purpose of this study is to fill this gap by including immersion as a causal organism in the SOR model, investigating how immersion affects emotional and cognitive responses, and how this affect purchase intention.

2.4 The interaction between UGC addiction and immersion, flow, and belongingness

With the arrival of the mobile Internet, both social media content and form have left traditional media far behind. User-generated content (UGC) is a novel form of content on the internet, which relies on information available online as content originated from multiple individuals. Through this model, users can share their own content, such as text, images, and videos (Krumm et al., 2008; Yi et al., 2020). Lu et al. (2022). The diversity and novelty of UGC with freshness, could attract teenagers to continuously use their apps and become addicted to them.

Previous research has revealed the fact that flow is a crucial component of the addiction development process in online games. Park and Hwang (2009) reported that flow mediated the relationship between telepresence and addiction to online games. Flow experience increases the chance of using UGC for entertainment (Moon et al., 2014). Seeing that there are numerous benefits associated with using mobile social networking sites (SNSs), their overuse is becoming increasingly common as users strive to get the most out of continued usage (Turel et al., 2011). The over usage of mobile SNS has plagued most users, according to Zheng and Lee (2016). For instance, Facebook addiction and "Weibo Kong," which means that users cannot stop using Weibo. (Wang et al., 2015).

Cairns et al. (2014) recognized immersion as a cognitive experience and represents the level of engagement. Consumer experiences can be categorized into real environments and indirect experiences, with different stimulus channels and levels of emotional immersion experiences (Wang et al., 2012). According to cognitive-emotional theory, cognitive appraisal of environmental experiences affects the emotional state of flow (Ding & Hung, 2021). The concept of flow was originally proposed by Csikszentmihalyi (1975) and has been widely studied in the fields of psychology, education, and music. Flow is often described as an optimal state of mind or spiritual immersion, or "being there". Flow can occur while performing almost any daily activity (e.g., reading, talking on the phone, etc.) (Mahnke et al., 2015). In social media environments, factors such as immersion, control, and a sense of immediate feedback have the potential to create a state of openness to the experience of mobility (Hoffman & Novak, 1996; Esteban-Millat et al., 2014).

Furthermore, sense of belonging is considered to be one of the causes of addiction (Gong et al., 2019). Gao et al. (2017) and Wang et al. (2015) pointed out that sense of belonging and habit can separately account for the basic emotional and behavioral states of addicted users. Sense of belonging and habits positively influence addictive behaviors by affecting users' perceived benefits of mobile SNS. If individuals have a strong sense of belonging to SNS, then they tend to use them frequently, thereby increasing the likelihood of obsession (Gao et al., 2017). Whilst there are many benefits

to be gained from engaging in online interactive activities, they can also lead to overdependence and addiction (Al-Debei et al., 2013; Lee et al., 2014).

Chapter 3 Hypotheses development and research model

3.1 Effects of VR and UGC technology on immersion

Virtual Reality (VR) technology has revolutionized the way people interact with digital content, offering immersive experiences that blur the lines between reality and the virtual world. One key aspect of these experiences is immersive presence, which refers to the extent to which users feel like they are part of the virtual environment (Steuer, 1992).

Previous research has shown that the quality of the technological experience and the content of the virtual environment significantly influence the sense of presence in VR. For example, Steuer (1992) suggested that more vivid and interactive VR environments lead to a higher sense of presence. Studies have also demonstrated that immersive VR experiences can evoke stronger emotional responses and increase social interactions (Pan & Hamilton, 2018). Hadi and Valenzuela (2019) found that tactile feedback in VR environments improved task performance, indicating a deeper sense of presence. Furthermore, the concept of telepresence, which refers to the feeling of "being there" in a mediated environment (Spagnolli et al., 2009; Steuer, 1992), highlights the importance of presence in shaping user experiences in VR. The development of advanced VR wearable devices has further enhanced the sense of presence and overall user experience (Neuhofer et al., 2012, 2015).

With the popularization of high-speed Internet and social network services, producing and appreciating UGC has become a daily activity for many internet users (Yu & Ko, 2021). Montgomery & Chester (2009) pointed out that state-of-the-art animation, high-quality video, and other multimedia applications are creating a new generation of immersive environments.

In the case of mukbang, for example, viewers may be repeatedly exposed to mukbang content, and then establish a quasi-social relationship with the media performer (Horton et al, 1956). This is initiated by the media performer and the relationship is not mutual. This relationship can develop between mukbang content providers and their viewers, for example on YouTube. UGC users can subscribe to a content provider's channel on the UGC platform and watch films on a regular basis, and UGC content providers regularly contact UGC users by 'viewing' them on screen (Sokolova & Perez, 2022). When viewers watch mukbangs for social reasons, such as self-expression, sense of belonging or social satisfaction (Kircaburun et al, 2021). In other words, mukbangs give emotional meaning to UGC users through technology. Based on these findings, it is reasonable to hypothesize that the technological

experience generated by both VR and UGC has positive effects on immersion. Specifically, we hypothesize that:

H1: Technological experience has positive effects on immersion.

3.2 Effects of VR and UGC content on immersion

High-quality content in Virtual Reality (VR) has been shown to evoke strong emotional responses and enhance social interactions among users. Unlike Augmented Reality (AR), which overlays digital content onto the real world, VR fully immerses users in virtual environments (Gutiérrez et al., 2008). This immersive nature allows for profound emotional experiences, influencing users' perceptions and responses.

User-generated content (UGC)—considered one of the fastest-growing forms of content on the Internet, as it includes any material created and uploaded by non-media professionals (e.g., comments, blogs, social networking profiles, or videos) (Interactive Advertising Bureau, 2008). Lu et al. (2022) argued that the creation threshold of UGC is low, the creative styles and genres are diverse, and therefore the content is rich. Compared with reading journals and other experiences, UGC can satisfy the entertainment needs of a wide range of people in different ways in order to appeal to the public, including the youth group. Nonetheless, scholars have suggested that the richness of the content of short films has in some ways aggravated individuals' addiction to short videos (Yang et al., 2021). Based on these findings, we hypothesize that:

H2: Content quality has positive effects on immersion.

3.3 Effects of immersion on emotional reaction and social interaction

Studies have also demonstrated that immersive VR experiences can arouse emotional reaction and increase social interactions (Pan & Hamilton, 2018), because the sense of presence is also important for shaping social interactions within VR environments (Slater & Wilir, 1997). In socially-oriented VR environments like Second Life, social interactions are essential for creating a sense of immersion (Grinberg et al., 2014). Nagy and Koles (2014) found that interaction with virtual objects can increase immersion by enhancing individual identification with the virtual environment. This aligns with Tussyadiah et al. (2018), who found that interactive features in tourism VR experiences were associated with increased immersion.

In a study by Jang et al. (2019), high-quality VR content was found to evoke strong emotional responses, particularly when the content was vivid and realistic. Pizzi et al. (2020) showing that well-crafted narratives and immersive experiences can significantly impact users' emotional states. Similarly, Wei et al. (2019) found that the realism and interactivity of VR content can enhance social interactions among users, leading to more engaging and meaningful experiences.

It has become a common phenomenon in the digital age that people spend long hours repeatedly updating social events shared on social networking services (SNS) to extend and maintain relationships (Boyd & Ellison, 2007; Ellison et al., 2007; Lin & Lu, 2011a; Powell, 2009). UGC users can subscribe to a content provider's channel on the UGC platform and watch films on a regular basis, interactive with other users (Sokolova & Perez, 2022). More active users have more opportunities to learn online languages, programmes, and communication protocols, and build a higher level of trust with their online friends, their interactions and sharing are more likely to be more enjoyable (Lin & Lu, 2011b; Powell, 2009; Tapscott, 2008). Whilst there are many benefits to be gained from engaging in online interactive activities, they can also lead to overdependence and addiction (Al-Debei et al., 2013; Lee et al., 2014)

Scholars have suggested that the richness of the content of short films has in some ways aggravated individuals' addiction to short videos (Yang et al., 2021). For teenagers, these new tools offer a strong appeal for "self-reflection, catharsis, and self-documentation (Stern, 2007), and in turn reduced their interest in the things that surround them in their daily lives (Yang et al., 2021). According to the aforementioned behaviors, Fernandez et al. (2020) explored the effects of short-term abstinence on potential behavioral addictions and found that respondents exhibited symptoms such as cravings and relapses after abstinence and were less interested in their surroundings. Based on these findings, it is reasonable to hypothesize that the immersion has positive effects on emotional reaction and social interaction. Specifically, we hypothesize that:

H3: Immersion has positive effects on emotional reaction.

H4: Immersion has positive effects on social interaction.

3.4 Effects of emotional reaction and social interaction on purchase intention

Emotional reaction has positive effects on purchase intention. Previous studies have shown that responses represent the outcomes and decisions of users based on cognitive and affective responses, including behaviors of approach or avoidance (Sherman et al., 1997). Purchase intention is a subjective tendency of consumers to purchase products, has been widely discussed in the literature (Ali et al., 2015; Ryu et al., 2012).

Attitude was defined as the general, enduring, and long-term evaluation of a person, place, or object (Solomon, 2014), has multiple dimensions, including cognition and affect (Fiore & Kim, 2007). Studies have found a significant and positive relationship between consumers' attitude and their purchase intentions or behaviors (Ajzen & Fishbein, 1980; Simester, 2016). Assuming that emotions are integrated into users' assessments to facilitate decision-making processes (Schwarz & Clore, 2003, 2007; Winkielman et al., 2003), affective responses to product presentations may drive

behavioral outcomes. For example, positive feelings that online shoppers experience when interacting with a product display might “spill over” to the product and influence actual behavior (Elder & Krishna, 2012; Pham, 1998). Therefore, we predict that:

H5. Emotional reaction has positive effects on purchase intention.

Social interaction plays a crucial role in shaping human behavior and desires. Online platforms with interactive features, provide spaces for individuals with similar interests to connect, fostering both commercial and social value creation. E-commerce platforms like Facebook and Instagram incorporate online communities into their profit models highlighting the importance of understanding the interaction mechanisms in social commerce communities for the sustainable development of e-commerce (Yin et al., 2019).

Social interaction theory considers that social interaction serves as a key motivator for behavior. In the realm of social commerce, success is not only determined by being at the network center but by access to a larger user base (Stephen et al., 2010). The characteristics and behaviors of community users have a clustering effect and may be influenced by their surrounding friends. (Zhang & Benyoucef, 2016) and the design of retail platforms (Goldfarb et al., 2015).

While existing research in e-commerce often focuses on trust and perceived risk as the dominant psychological factors influencing purchase intention (Yin et al., 2019), further exploration within the context of social interaction in social commerce is necessary. Understanding how perceived risk and trust impact consumer purchase intention in social commerce environments requires more in-depth investigation (Yin et al., 2019). Social commerce's rich user-generated content and interactive features enhance word-of-mouth marketing effectiveness (Yin et al., 2019). In addition, users' acceptance to interactive content such as product recommendations and user experiences depends on the closeness of the user relationship. Users tend to be in contact with more intimate friends and are more receptive to their opinions (Liang et al., 2011). Based on this research, it can be hypothesized that:

H6. Social interaction has positive effects on purchase intention.

3.5 Effects of immersion on purchase intention

Based on the previous paragraph the article mentioned that immersion is considered as a cognitive experience that represents the level of engagement (Cairns et al., 2014) In this state, a person not only feels surrounded and included but also interacts with an environment that provides continuously stimulating information and experiences (Stanney et al., 1998). Whereas, the vividness of live shopping can help customers perceive immersion, thus making it easier to appeal customers (Yim et al.,

2017). Past studies have shown that customers' perceived immersion and engagement experience is beneficial to the interpersonal relationship and trust between the host and the audience in live-streaming shopping, thus positively affecting their evaluations and behavioral intentions (Zhang et al, 2022). Based on these findings, we hypothesized that:

H7. Immersion has positive effects on purchase intention.

Based on above hypotheses, we created a research framework (see Figure 2).

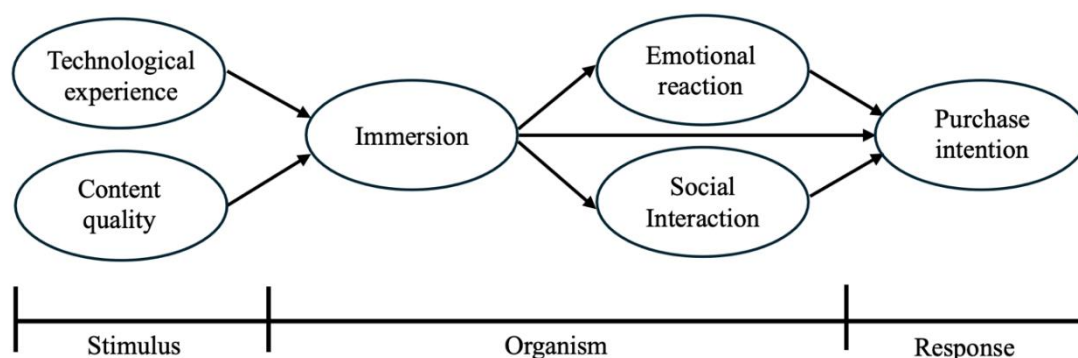


Figure 2. Research framework

Chapter 4 Methods

4.1 Subjects and procedures

The method to carry out this study was using two separate experiments to investigate different variables, VR and UGC, with distinct groups of participants. After participating in their respective experiments, participants completed surveys based on the theme they experienced. Analyses were conducted with a total of 188 subjects, 108 of them are experimental subjects for UGC and 80 of them are for VR. Subjects were recruited through Facebook VR group, Dcard, sign-up sheet, and by word of mouth. To encourage participation, the survey was conducted anonymously, and participants were assured that all provided information would be kept confidential and used solely for aggregate statistical analyses.

For the VR experiments, 80 subjects were divided into groups of two to test the VR brand game, “Wendyverse”, in a laboratory setting. "Wendyverse" is a virtual reality game developed in collaboration between Wendy's, the world's second or third largest hamburger fast-food chain, and Meta's Horizon Worlds. It was launched in April 2022. Through Meta Quest 2 VR head-mounted display (HMD), “Wendyverse” allows

users to engage with the Wendy's brand in an immersive and interactive environment ("Wendy's," 2022).

Compared to other fast-food brands, Wendy's doesn't just create a virtual restaurant in metavers. It has developed multiple themed worlds, each centered around Wendy's signature menu items. This approach allows users to immerse themselves more deeply in the Wendy's brand experience. Additionally, "Wendyverse" is one of the few virtual realities game that integrates real-world promotional activities, aiming to increase overall user engagement by offering discounts and strategically utilizing various social media platforms to reach a broader audience (LBB Editorial, 2022). Therefore, we chose "Wendyverse" as the brand game for this experiment. They were instructed to freely experience the atmosphere of the game and interact with other players without specific tasks. Each session lasted approximately fifteen to twenty minutes, depending on the subject's adaptability. After the experiment, participants immediately filled out individual survey to analyze various aspects of VR marketing. However, literature has indicated that not all users fully adapt to VR technology. The immersive presence of VR can cause discomfort, resulting in symptoms such as dizziness and nausea. According to McCauley and Sharkey (1992), this phenomenon is called as cybersickness, also known as VR sickness. When cybersickness occurs, it can inhibit the user's VR experience (Chang et al., 2020). Therefore, if any participant felt uncomfortable within fifteen minutes, the experiment was terminated immediately, and their data was excluded to ensure both accuracy and participant safety.

For the UGC experiments, 108 subjects were tested individually. They were asked to watch six UGC videos from TikTok related to Wendy's, with video lengths ranging from fifteen seconds to two and a half minutes. According to Gesmundo and other researcher (2020), TikTok aims to provide users with the ability to create videos easily using convenient tools and filters, enabling them to run marketing campaigns and reach a wide audience of potential customers. The research by Mumtaz and Saino (2021) also supports that the rise of TikTok has indirectly turned it into a strategic platform for marketers to reach and directly interact with consumers. Therefore, TikTok would be an ideal social media platform for this study to do the UGC experiment. In the experiments, all participants confirmed that they have watched each video in its entirety. This ensured that subjects viewed a variety of UGC videos and absorbed different qualities of brand-related content. After watching the videos, participants completed a survey to investigate several aspects of UGC marketing.

4.2 Measures

Constructs in this study were measured using five-point Likert scales, from 1 (strongly disagree) to 5 (strongly agree), which were designed and modified according

to previous literature (see Appendix 1 and 2). And the statistic tool we used is SAS. While many studies have been published on UGC-related experiments, research specifically focused on VR is limited. To ensure the readability and reliability of the VR-specific scale, we conducted a pilot test with 30 participants before the actual survey.

Technical experience and content quality for VR and UGC was measured by a slightly modified version of content quality and system quality scale from Lee et al., (2020). Immersion in VR was measured by a three-item scale from a Telepresence scale (Kim & Choo, 2023). Social interaction in VR was measured by a three-item scale that was modified from a social interaction scale from Yin et al., (2019). Emotional reaction and purchase intention for VR and UGC were assessed by using a three-item scale from emotional involvement and visit intention scale (Kim et al., 2018). Immersion and social interaction in UGC were measured by a modified version of social presence and sociability scale from Jin et al., (2017).

For control variable, we included participants' gender and ages. The literature indicates that, under certain circumstances, gender (e.g., Madahi & Sukati, 2012) and age (e.g., Lu et al., 2022) might influence the purchase intention of customers and the addiction of applications, so these variables were controlled for this study.

Chapter 5 Data analysis and results

This study performed data analyses with the following steps. First, we conducted an exploratory factor analysis (EFA) to examine which questions converge on an underlying factor. Second, the survey data were analyzed using confirmatory factor analysis (CFA) to assess scale reliability and validity. Third, this study employed hierarchical moderated regression analyses to test the hypothesized relationships. Finally, we used independent sample *t*-test to analyze the comparison of the experimental objects VR and UGC in each variable.

5.1 Exploratory factor analysis (EFA)

The test results of EFA are presented in Table 1, showing the underlying relationships between questionnaire items and the factors measured by the questionnaire (Dabbagh et al., 2023). We categorized 17 questions into six latent factors without any confounding or overlap. Two of the questions had extremely low correlations with the six factors and were removed from the calculation after pilot test. According to the EFA results, questions 12, 13, and 14 were labeled as emotional interaction, analyzing how users' emotions changed during gameplay. Questions 15, 16, and 17 were referred to purchase intention, examining whether users would visit and make purchases at the brand's physical restaurant after the VR and UGC experience.

Questions 1, 2, and 3 were related to technical experience, checking the comfort and stability of the HMD. Questions 10 and 11 were categorized under social interaction, measuring how much users interacted socially within the game. Questions 4 and 5 were classified under content quality, measuring the quality, design, and richness of content. Lastly, the sixth factor was labelled as immersion and entailed questions 7 and 9, evaluating the design elements of the Wendyverse game, including game graphics, audio effect, and interactive content.

Table 1. Exploratory factor analysis result

Questions	Factors					
	Emotional reaction	Purchase intention	Technical experience	Social interaction	Content quality	Immersion
Q1	0.15	-0.15	0.70	0.12	0.06	-0.27
Q2	-0.20	0.14	0.70	0.11	0.21	-0.14
Q3	0.02	0.03	0.86	-0.08	-0.11	0.35
Q4	-0.05	-0.12	0.03	0.08	0.93	0.12
Q5	0.19	0.11	0.41	-0.11	0.52	0.07
Q7	-0.02	0.08	-0.11	-0.03	0.19	0.86
Q9	0.47	-0.18	0.08	0.17	-0.09	0.52
Q10	0.02	0.08	0.11	0.82	-0.06	0.03
Q11	0.01	0.04	-0.00	0.83	0.13	0.01
Q12	0.86	-0.01	0.12	0.08	-0.02	-0.12
Q13	0.77	0.10	-0.09	0.02	0.00	0.17
Q14	0.89	0.10	-0.03	-0.11	0.02	0.01
Q15	0.26	0.70	-0.24	0.02	0.16	-0.05
Q16	0.04	0.95	0.15	-0.08	-0.07	-0.03
Q17	-0.08	0.82	0.03	0.25	-0.13	0.09

Notes: Q6 and Q8 were removed from the calculation after pilot test.

5.2 Confirmatory factor analysis (CFA)

The test results of CFA are shown in Table 2, performing on all items corresponding to the six constructs measured. According to the CFA results, most of goodness-of-fit indices meet the required rule-of-thumb levels of acceptance ($\chi^2 = 171.36$ [df =75, $p < .0001$], SRMR= 0.07, RMSEA = 0.08, GFI =0.90; CFI = 0.93). And all standardized loadings were statistically significant ($p < 0.001$) and exceeded 0.60 (O'Rourke & Hatcher, 2013) which showed that the measurement model fit with its survey data well.

Convergent validity was confirmed using three criteria to ensure that the measurement model fit well with the survey data. First, the standardized path loading

of each item had to be statistically significant and greater than 0.6 (Gefen, Straub, and Boudreau, 2000). Second, the composite reliability (CR) for each construct needed to be greater than 0.7. Third, the average variance extracted (AVE) for each construct had to exceed 0.5 (Fornell and Larcker, 1981). As shown in Table 2, all standardized path loadings were statistically significant ($p < 0.001$) and exceeded 0.6. While the CR for one construct, CRIM, was below 0.7, it is considered acceptable if CR values fall between 0.60 and 0.70 (Hair et al., 2014). Most AVEs were above 0.5, except for AVETE (0.48) and AVEIM (0.45). However, according to Fornell and Larcker (1981), if the AVE is less than 0.5 but the composite reliability is higher than 0.6, the convergent validity of the construct is still adequate. Therefore, AVETE and AVEIM were acceptable since CRTE and CRIM were higher than 0.6 (0.73, 0.62). Overall, since the experiment was carried out under adverse conditions, the results were reasonably reliable.

Table 2. Confirmatory factor analysis result

Construct	Indicators	Standardized loading	AVE	Cronbach's α
Emotional reaction	ER1	0.73 (t= 21.59)	0.48	0.73
	ER2			
	ER3			
Purchase intention	PI1	0.74 (t= 18.69)	0.59	0.71
	PI2			
	PI3			
Technical experience	TE1	0.62 (t= 11.04)	0.45	0.61
	TE2			
	TE3			
Social interaction	SI1	0.76 (t= 22.20)	0.62	0.76
	SI2			
Content quality	CD1	0.87 (t= 52.89)	0.69	0.87
	CD2			
Immersion	IM1	0.86 (t= 49.71)	0.68	0.86
	IM2			

Goodness-of-fit indices (N=188): $\chi^2_{75} = 171.36$ (p -value < 0.001); SRMR= 0.07; RMSEA = 0.08; GFI =0.90; CFI = 0.93

5.3 Hierarchical moderated regression analysis

With the measurement model fitting the survey data, we proceeded to perform hierarchical moderated regression analyses. The results presented in Table 4 examine the mediation effects of emotional reaction, social interaction, and immersion, as well as the moderation effect on purchase intention.

In this study, age and gender were included as control variables in all five models to explain three mediators, revealing that all control variables were insignificantly related to immersion, social interaction, and emotional interaction. In Model 1, this study includes emotional reaction, social interaction, and immersion to explain purchase intention, showing that both emotional reaction ($r = .44, p < .01$) and social interaction ($r = .37, p < .01$) positively relate to purchase intention, whereas immersion is insignificantly related to purchase intention ($r = .07, p = .41$). In Model 2, excluding immersion from Model 1, all other variables are included together to explain purchase intention, finding that emotional reaction ($r = .48, p < .01$) and social interaction ($r = .37, p < .01$) remain significantly positive in relation to purchase intention (thus *H5* and *H6* were supported). In Model 3, this study includes only immersion to explain emotional reaction, showing a strong positive correlation ($r = .59, p < .01$) between them (thus *H3* was supported). In Model 4, this study uses the same variable as in Model 3 but aims to explain social interaction, indicating that immersion also has a highly positive correlation ($r = .28, p < .01$) with social interaction (thus *H4* was supported). Lastly, in Model 5, this study includes technical experience and content quality to explain immersion. Here, it is worth noting that technical experience was shown not to be significantly related to immersion ($r = -.06, p = .59$). This result appears to reject the assumption that immersion requires the experience of technology to be created (thus *H1* was not supported). Another result reveals that immersion is significantly associated with the content quality variable ($r = .34, p < .01$). That is, the richness and quality of content will have a strong positive impact on immersion (thus *H2* was supported). From the above test results, it suggests that immersion has no direct effect on purchase intention, thus supporting an indirect effect on purchase intention only via emotional interaction and social interaction (thus *H7* was not supported).

Table 3. Hierarchical moderated regression analysis result

	Model 1	Model 2	Model 3	Model 4	Model 5
	Purchase	Purchase	Emotional	Social	Immersion
	intention	intention	reaction	interaction	
<i>Control variables</i>					
Gender (M/F)	-0.04	-0.05	0.06	0.23	-0.05
Age	-0.01	-0.02	0.00	0.05	-0.08
<i>Antecedents</i>					
Technical experience					-0.06
Content quality					0.34**
<i>Mediators</i>					
Emotional reaction	0.44**	0.48**			
Social interaction	0.37**	0.37**			

Immersion	0.07	0.59**	0.28**
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Notes: *p < 0.05; **p < 0.01

Table 4. Empirical results of hypotheses

Hypotheses	Results
<i>H1</i> : Technological experience has positive effects on immersion.	Not Supported
<i>H2</i> : Content quality has positive effects on immersion.	Supported
<i>H3</i> : Immersion has positive effects on emotional reaction.	Supported
<i>H4</i> : Immersion has positive effects on social interaction.	Supported
<i>H5</i> : Emotional reaction has positive effects on purchase intention.	Supported
<i>H6</i> : Social interaction has positive effects on purchase intention.	Supported
<i>H7</i> : Immersion has direct positive effects on purchase intention.	Not Supported

5.4 Independent samples *t*-test

In addition to confirming how the technical experience and content quality of both VR and UGC affect purchase intention, this study also examines six distinct elements derived from our research framework. These six elements are present in both VR and UGC groups. We aim to determine which group (i.e. technical experience and content quality) has a stronger influence on each element. To achieve this, we used independent samples *t*-test to compare the means of these elements between the VR and UGC groups, the result presented in Table 5. It can be evaluated whether the means of influence of both VR and UGC on the six elements are significantly different or not.

In Table 5, there are six *t*-tests that respectively detect differences in technical experience, content quality, immersion, emotional reaction, social interaction, and purchase intention between the VR and UGC groups. In Test 1, the 80 participants from the UGC experiment (M = 4.27, SD = .65) compared to the 108 participants from the VR experiment (M = 4.03, SD = .70) demonstrated significantly better peak flow scores in technical experience, $t(186) = -2.46, p < .05$. In Test 2, there was no significant effect for content quality, $t(186) = .60, p = .547$, despite VR (M = 4.03, SD = .78) attaining higher scores than UGC (M = 3.97, SD = .73). In Test 3, the results indicated that there was a significant difference in immersion between the two groups, with VR (M = 4.20, SD = .66) scoring higher than UGC (M = 3.46, SD = .56), $t(186) = 8.32, p < .01$. In Test 4, VR (M = 4.40, SD = .59) had significantly higher scores for emotional reaction than UGC (M = 3.64, SD = 0.89), $t(184.04) = 7.05, p < .01$. The results of Test 5 showed a significant effect for social interaction, $t(133.16) = -2.79, p < .01$. Lastly, Test 6, comparing purchase intention between VR (M = 3.60, SD = 1.00) and UGC (M = 3.48, SD = .97), indicated that this difference was not significant, $t(186) = 1.04, p = .301$.

Table 5. Independent samples *t*-test result

Group Statistics

	Marketing Strategies	N	Mean	Std. Deviation	Std. Error Mean
Technical experience	VR	80	4.03	.704	.079
	UGC	108	4.27	.653	.063
Content quality	VR	80	4.03	.784	.088
	UGC	108	3.97	.726	.070
Immersion	VR	80	4.20	.657	.073
	UGC	108	3.46	.562	.054
Emotional reaction	VR	80	4.40	.592	.066
	UGC	108	3.64	.890	.086
Social interaction	VR	80	3.61	1.028	.115
	UGC	108	3.99	.715	.069
Purchase intention	VR	80	3.60	.995	.111
	UGC	108	3.45	.970	.093

Independent Samples *t*-test

		Levene's Test for Equality of Variances		<i>t</i> -test for Equality of Means						
		F	Sig.	t	df	Two-sided p	Mean difference	Std. error difference	95% Confidence Interval of the difference	
									Lower	Upper
Technical experience	Equal variances assumed	.700	.404	-2.464	186	.015	-.245	.100	-.442	-.049
	Equal variances not assumed			-2.436	162.808	.016	-.245	.101	-.444	-.046
Content quality	Equal variances assumed	.038	.845	.603	186	.547	.067	.111	-.152	.285
	Equal variances not assumed			.596	162.814	.552	.067	.112	-.155	.288
Immersion	Equal variances assumed	3.723	.005	8.310	186	.000	.740	.089	.565	.916

Examining Virtual Reality and User-Generated Content Impact on Purchase Intentions in Brand Marketing : Based on Stimulus-Organism-Response model

	Equal variances not assumed				8.119	154.267	.000	.740	.091	.560	.921
Emotional Reaction (Test 4)	Equal variances assumed	17.666	.000		6.649	186	.000	.762	.115	.536	.989
	Equal variances not assumed				7.047	184.037	.000	.762	.108	.549	.976
Social interaction (Test 5)	Equal variances assumed	12.146	.001		-2.938	186	.004	-.374	.127	-.624	-.123
	Equal variances not assumed				-2.789	133.163	.006	-.374	.134	-.639	-.109
Purchase intention (Test 6)	Equal variances assumed	.371	.543		1.036	186	.301	.150	.145	-.134	.435
	Equal variances not assumed				1.032	167.904	.303	.150	.145	-.137	.437

Chapter 6 Discussion

Our research focuses on examining how two of the most popular marketing methods today, Virtual Reality (VR) and User-Generated Content (UGC), influence consumers' purchase intentions. We also compare their strengths and weaknesses in the marketing process to provide suggestions for future improvements and development. To achieve this goal, we conducted a two-stage study designed based on the SOR (Stimulus-Organism-Response) theory. In the first stage, we studied the stimuli of technological experience and content quality that both VR and UGC possess. Previous research indicates that the immersion for VR mainly stems from its technological experience and content quality (Gutiérrez et al., 2008; Hadi & Valenzuela, 2019). Similarly, the immersion in UGC is also related to these two elements (Kircaburun et al, 2021; Yang et al., 2021). Therefore, our study innovatively combines research on both UGC and VR, using the SOR theory to explore the formation of purchase intention. We introduced immersion as the organism, explaining how VR and UGC generate purchase intentions through emotional responses and social interactions. Subsequently, we conducted a comparative analysis of each factor to explain the advantages and developmental potential of VR and UGC in these aspects.

6.1 Formation of purchase intention and influencing factors

In the first phase of our study, we focused on how technological experiences and content quality impact the sense of immersion and consequently affect the purchase intentions of consumers. Our experimental results indicate that immersion can create strong positive emotional response and social interaction. Such findings are relevant to

Ajzen & Fishbein, 1980; Simester, 2016; Liang et al., 2011 research that has confirmed the positive association between the emotional response and social interaction with purchase intention. Based on these results, we conclude that increasing the level of immersion in marketing strategies can significantly enhance users' purchase intentions. However, it is important to note that in designing marketing strategies, the focus should not solely be on enhancing immersion to increase purchase intention. Instead, the focus should be on how to enhance immersion to elicit emotional responses and social interactions. This is because immersion does not directly impact purchase intention.

Additionally, our study showed that the content quality will matter the most in imparting the sense of immersion compared to the technological experience. Some previous research hinted that better technological experiences result in better immersion (Neuhofer et al., 2012, 2015), whereas content quality is significantly positively associated with immersion. And from the results, the association between technological experience and immersion is insignificant. This means that marketing attempts should prioritize the innovation and quality of content. For the future research, it should explore how different content quality elements such as visual effects, storytelling, and interactivity will affect immersion and how to optimize the content quality that can enhance both immersion and purchase intention.

6.2 Comparative analysis of VR and UGC factors

In the second phase, we compared the five factors affecting purchase intentions (i.e. content quality, immersion, emotional response, social interaction, and purchase intention) between VR and UGC. The results indicated that there are no significant differences between VR and UGC in terms of the content quality. However, VR significantly outperforms UGC in terms of immersion, suggesting that with the same content quality, VR can provide a higher level of immersion. This also implies that other factors may influence immersion, warranting further exploration in future studies.

In the case of emotional response, VR is better than UGC, indicating that VR might be more effective in emotionally driven marketing content. This advantage mainly lies in the strength of higher immersion and more vivid content presentation in VR, which once again confirms the positive correlations among immersion, emotional response, and purchase intention. On the contrary, UGC is better than VR in the performance of social interaction, making it a powerful tool for marketing activities that emphasize user interaction and community engagement. In this situation, companies should leverage UGC's strengths to boost brand loyalty and user participation.

When comparing purchase intentions, there is no significant difference between VR and UGC. While the current differences in purchase intentions are minimal, our results suggested that VR holds slightly more potential than UGC. With technological advancements, VR might eventually surpass UGC to become a more dominant

marketing tool. Therefore, businesses should monitor VR development trends and strategically position themselves to seize future market opportunities. However, at present, our study concluded that VR and UGC do not significantly differ in their impact on purchase intention.

Lastly, future marketing strategies should consider integrating the strengths of both VR and UGC. Combining VR's immersive experience with UGC's social interaction can create richer and more diverse marketing experiences. This combination can maximize the advantages of both methods, leading to more effective marketing outcomes.

Chapter 7 Limitations and future research

This study has three limitations that may suggest directions for future research. Firstly, the VR game this study selected, "Wendyverse," lacks completeness. "Wendyverse" is a metaverse world within Horizon Worlds, a virtual social platform created by Meta, where people can explore, play, and interact through immersive VR ("Wright," 2022). Originally, "Wendyverse" was developed for the brand marketing campaign "Buck Biscuit Dome", a virtual reality restaurant promotion, which ran from April 1 to May 1, 2022. During this campaign, customers could visit Wendy's stores to enjoy \$1 sausage, bacon, and cheese biscuits ("DiPalma," 2022). However, this experiment was conducted in April 2024, long after the campaign had ended and the "Wendyverse" was no longer actively managed, resulting in an empty metaverse. Although we conducted our tests in pairs to compensate for the lack of social interaction, we were unable to fully capture the vibrant atmosphere of "Wendyverse" during the campaign period. Future research could benefit from selecting VR games with ongoing marketing campaigns, as this would provide a more dynamic and realistic interaction between participants and other players.

Secondly, participants in this experiment were not categorized or limited based on their VR experience. This could lead to inaccurate data, as VR has not yet become widely adopted. Participants unfamiliar with VR might exhibit an overly high purchase intention and favorable impression due to the novelty of the experience, thus skewing the results. As VR becomes more common, future experiments should focus on participants with varying levels of VR experience to obtain more accurate data.

Finally, HMD for VR used in this experiment was the Meta Quest 2, released in 2020. This device is not the latest model available, and there may be differences in technical quality, comfort, and overall experience compared to newer HMDs. Future experiments should use the latest VR equipment to ensure that the results reflect the current state of VR technology.

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Appendix 1. Measurement items- Virtual Reality

The variables measured by

Technical Experience (Source: Lee et al, 2018)

1. The device responds quickly to my actions.
2. The design of the device makes me feel comfortable.
3. The stability of the system helps to improve the quality of the game.

Content Quality (Source: Lee et al, 2018)

1. The background music of “Wendyverse” is well designed.
2. The scenery of “Wendyverse” is well planned.
3. Wendy verse offers many interactive experiences.

Immersion (Source: Kim and Choo, 2023)

1. I felt strongly that I was in a different space.
2. I couldn't feel the changes in the real world while experiencing the game.
3. I know I have entered the virtual world.

Social Interaction (Source: Yin et al, 2019)

1. I don't feel alone in the “Wendyverse”.
2. I can talk to other players in the “Wendyverse”.

Emotions (Source: Kim et al, 2018)

1. I am happy with my experience in this game.
2. I am excited about my experience in the “Wendyverse”.
3. I was surprised by my experience in the “Wendyverse”.

Purchase Intention (Source: Kim et al, 2018)

1. I will travel and spend money on the scenes I see in virtual reality games in the near future.
2. I am likely to make purchases in the scenes I observe in the virtual reality game.
3. If necessary, I will spend money in the scenes I observe in the virtual reality game.

Appendix 2. Measurement items- User-generated content

The variables measured by

Technical Experience (Source: Lee et al, 2018)

1. The stability of the Internet allows me to browse user-generated content smoothly.
2. The portability of the device allows me to browse user-generated content anytime, anywhere.

3. The quality of user-generated content (e.g. video quality) enhances my browsing experience.

Content Quality (Source: Lee et al, 2018)

1. The background music of the user-generated content affects my browsing experience.
2. The font design of the user-generated content makes it easier for me to browse.
3. The illustration/ animation design of user-generated content makes me feel approachable.

Immersion (Source: Jin et al, 2016)

1. I can't respond to others' calls when browsing user-generated content.
2. I can't focus on anything else while browsing user-generated content.
3. I can focus on the user-generated content I'm browsing.

Social Interaction (Source: Jin et al, 2016)

1. I can fully interact with other users through user-generated content.
2. User-generated content allows me to start conversations with other users.

Emotions (Source: Kim et al, 2018)

1. I feel happy when browsing user-generated content.
2. I feel excited when browsing user-generated content.
3. I feel surprised when browsing user-generated content.

Purchase intention (Source: Kim et al, 2018)

1. I will visit and spend money on the scenarios I observe in user-generated content in the near future.
2. I am likely to make purchases at the scenes I observe in user-generated content.
3. I will spend money on the scenes I observe in user-generated content if I need to.