The Influence of Virtual Reality on Consumer Decision Making through a Neuromarketing Perspective

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ABSTRACT

Consumer decisions are not entirely rational, but are influenced by emotions, intuition, and unconscious biases. Neuromarketing approaches provide new ways to uncover previously undetected psychological mechanisms behind consumer decisions. This study aims to analyze the synergistic impact of neuromarketing devices and virtual reality experiences on consumer decision-making, with particular emphasis on the mediating role of consumer emotional engagement. This research method uses a quantitative research design. Data were collected from 100 university students in Medan City, Indonesia, who are active Shopee users, through a structured questionnaire. Data analysis was conducted using Smart PLS. The results revealed a significant direct effect of neuromarketing tools on emotional engagement and consumer decision-making, as well as a strong influence of virtual reality experiences on emotional engagement. Although the direct effect of virtual reality on decision-making was not significant, emotional engagement significantly mediated the relationship between neuromarketing tools and virtual reality experiences on consumer decision-making. These findings underscore the important role of emotional engagement as a channel for the effectiveness of advanced marketing technologies.

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Keywords*: Decision Making, Emotional Engagement, Neuromarketing, Virtual Reality*

ABSTRAK

Keputusan konsumen tidak sepenuhnya rasional, melainkan dipengaruhi oleh emosi, intuisi, dan bias bawah sadar. Pendekatan neuromarketing memberikan cara baru untuk mengungkap mekanisme psikologis yang sebelumnya tidak terdeteksi di balik keputusan konsumen. Studi ini bertujuan untuk menganalisis dampak sinergis dari perangkat neuromarketing dan pengalaman realitas virtual terhadap pengambilan keputusan konsumen, dengan penekanan khusus pada peran mediasi keterlibatan emosional konsumen. Metode penelitian ini menggunakan desain penelitian kuantitatif. Data dikumpulkan dari 100 mahasiswa di Kota Medan, Indonesia, yang merupakan pengguna aktif Shopee, melalui kuesioner terstruktur. Analisis data dilakukan menggunakan Smart PLS. Hasil penelitian mengungkapkan efek langsung yang signifikan dari perangkat neuromarketing pada keterlibatan emosional dan pengambilan keputusan konsumen, serta pengaruh yang kuat dari pengalaman realitas virtual pada keterlibatan emosional. Meskipun efek langsung realitas virtual pada pengambilan keputusan tidak signifikan, keterlibatan emosional secara signifikan memediasi hubungan antara alat neuromarketing dan pengalaman realitas virtual dengan pengambilan keputusan konsumen. Temuan ini menggarisbawahi peran penting keterlibatan emosional sebagai saluran bagi efektivitas teknologi pemasaran tingkat lanjut.

Kata kunci*: Pengambilan Keputusan, Keterlibatan Emosional, Neuromarketing, Realitas Virtual*

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INTRODUCTION

Consumer decision-making has become a crucial area of research in contemporary marketing, especially as technological advancements continue to reshape how consumers interact with products and services. This transformation is driven by the integration of neuromarketing tools and Virtual Reality (VR) technologies, which aim to uncover consumer preferences and enhance engagement through immersive experiences. These innovative methods have shifted traditional paradigms in understanding consumer behavior by emphasizing the role of emotional engagement as a bridge between stimuli and consumer decisions (Plassmann et al., 2015). The rapid adoption of these technologies reflects their potential to create deeper connections with consumers something essential in an era of intense competition and increasing demands for personalization (Buhrau & Sujan, 2015; Sujana & Yusni, 2024).

Consumer decision-making encompasses the processes individuals go through to identify needs, evaluate options, and make decisions. These processes are influenced by a variety of cognitive, emotional, and environmental factors (Bettman et al., 1998). Puente-Torre et al. (2024) explored how external stimuli, such as marketing messages and digital interfaces, interact with intrinsic psychological mechanisms to shape consumer choices. Horsley et al. (2014) study suggests that decision-making is not entirely rational but is heavily influenced by subconscious processes and emotional triggers, which neuromarketing aims to uncover. A deeper understanding of these processes has significant implications for designing more effective marketing strategies (Grewal & Roggeveen, 2020; Pedol et al., 2021).

Neuromarketing tools and techniques such as electroencephalography (EEG), Functional Magnetic Resonance Imaging (fMRI), and eye-tracking have revolutionized how researchers and marketers understand consumer behavior. These technologies provide insights into neural responses that traditional surveys and focus groups fail to capture (Archana & Mahajan, 2023; Silva et al., 2020). For instance, EEG and fMRI can reveal how consumers emotionally respond to advertisements, while eye-tracking maps visual attention to specific product features or designs (Kong et al., 2021). Despite their potential, ethical concerns and the high costs of neuromarketing tools present challenges that require further research into how to optimize their use (Cenizo, 2022; Oliveira et al., 2022).

Virtual reality experiences are increasingly used in marketing as tools to immerse consumers in highly interactive and realistic environments. VR enables brands to simulate real-life experiences, enhancing consumer engagement and decision-making by providing direct interaction with products or services (Flavián et al., 2019). Studies have shown that VR creates a sense of presence, which significantly influences consumers' perceptions of value and satisfaction (Javornik, 2016; Cruz et al., 2016; Ngo et al., 2025). However, the integration of VR into marketing strategies requires addressing technical and accessibility challenges, as well as understanding its long-term impact on consumer behavior (Xi & Hamari, 2021).

Consumer emotional engagement plays a vital role in influencing decision-making. Emotional engagement defined as the intensity of an individual's affective response to a stimulus drives consumer behavior by creating memorable and meaningful interactions (Pansari & Kumar, 2017). Research highlights the importance of emotional triggers in fostering loyalty and satisfaction, especially in competitive markets where emotional connections can differentiate brands (Mirbagheri & Najmi, 2019). As digital tools increasingly mediate consumer interactions, understanding how emotional engagement intersects with these technologies is essential to maximizing their impact (Lemon & Verhoef, 2016).

Despite these advancements, several gaps remain in the literature. Existing studies largely examine neuromarketing and VR technologies separately and rarely explore their combined impact on consumer decision-making, as highlighted by Kenning and Linzmajer (2011), Yung et al. (2021) and Yan et al. (2025). Moreover, although the role of emotional engagement is acknowledged, Dwivedi et al. (2021) note that its function as

a mediating variable connecting technological stimuli to decision outcomes has not been widely explored. Another important gap lies in the limited understanding of the ethical implications and long-term sustainability of using these advanced tools in marketing strategies. Furthermore, the effectiveness of neuromarketing and VR in diverse cultural contexts has yet to be adequately addressed. Addressing these gaps is critical for developing theoretical frameworks and practical applications in marketing. This study aims to examine the combined impact of neuromarketing tools and virtual reality experiences on consumer decision-making, with a specific focus on the mediating role of consumer emotional engagement. By bridging these gaps, this research seeks to offer new insights into how technology and emotion interact in shaping consumer behavior.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

Neuromarketing and Consumer Decision Making

The consumer decision-making process involves several stages, including the identification of needs, evaluation of available options, and selection of an action. This process is shaped by a complex interplay of cognitive, emotional, and environmental factors (Stankevich, 2017; Zhang et al., 2023). Behavioral economics suggests that consumer decisions are not entirely rational; instead, they are influenced by emotional triggers, intuition, and unconscious biases (Cartwright, 2024). In this regard, neuromarketing offers a novel approach to uncovering the hidden psychological mechanisms that drive consumer behavior. Hubert and Kenning (2008) and Çerçi (2024), neuromarketing refers to the application of neuroscience technologies such as electroencephalography (EEG), functional magnetic resonance imaging (fMRI), and eye-tracking to analyze how the brain responds to marketing stimuli. These advanced tools enable marketers to go beyond traditional research methods like surveys or interviews, providing deeper insights into consumers' attention, interest, and emotional responses (Hsu & Chen, 2020; Oliveira et al., 2022). fMRI, for instance, can identify specific brain regions that activate when consumers are attracted to a particular product, offering valuable data on emotional engagement and preference. Bhardwaj et al. (2024) explain that eye tracking technology helps determine which visual elements or product features attract the most attention during consumer interactions. By measuring these subconscious responses, neuromarketing allows brands to refine their marketing strategies and enhance the consumer experience.

H1: Neuromarketing tools and techniques have a significant effect on consumer emotional engagement.
H2: Neuromarketing tools and techniques have a significant effect on consumer decision-making.

Virtual Reality and Consumer Decision Making

Virtual Reality (VR) offers an interactive and immersive experience that can simulate real-life situations, thereby increasing consumer emotional engagement (Kinzinger et al., 2025). This technology allows users to interact with products or services in a virtual environment that closely resembles the real world. Through VR, consumers are no longer limited to observing goods through a screen or physical display, they can now explore and experience them in a simulated and controlled environment that evokes a stronger emotional connection. One of the most interesting features of VR in the context of marketing is its ability to create a heightened sense of presence. This refers to the psychological state in which individuals feel as if they are actually present in a virtual environment. According to Romano et al. (2021) and Xi et al. (2024), the sense of presence generated by VR significantly influences how consumers perceive value and satisfaction. When consumers feel more present in a virtual experience, they are more likely to form an emotional bond with the product or brand, increasing the chances of a profitable purchase decision. Additionally, VR allows marketers to create experiential campaigns that go beyond traditional media. Virtual experiences help bridge the gap

between physical and digital marketing, making it easier for consumers to evaluate products in ways that would not be possible in a conventional environment.

H3: Virtual reality experience has a significant effect on consumer emotional engagement.
H4: Virtual reality experience has a significant effect on consumer decision-making

Emotional Engagement and Consumer Decision Making

Emotional engagement refers to the intensity of an individual's affective response to a stimulus and plays a significant role in shaping consumer loyalty, satisfaction, and purchasing decisions (Siebert et al., 2020; Gultom et al., 2024). Emotional engagement reflects the degree to which a consumer is emotionally connected to a brand, product, or experience. Strong emotional engagement often results in increased trust, brand affinity, and long-term consumer commitment. According to Pantano and Servidio (2012), emotions serve as powerful psychological triggers that can enhance memory retention, strengthen brand connections, and create meaningful consumer experiences. Emotional responses tend to be more memorable than purely rational responses, which explains why emotionally charged marketing campaigns are often more successful in capturing consumer attention and driving action. Emotional engagement also helps differentiate brands in highly competitive markets by creating a sense of relevance and personal connection (Rendragraha & Suwaji, 2024). In the context of digital marketing, emotional engagement becomes even more important. Romano et al. (2021) argue that integrating emotional elements with advanced technologies such as Virtual Reality (VR) and neuromarketing can significantly increase the depth and quality of consumer interactions. The synergy between emotional content and technological innovation enables marketers to design personalized, impactful experiences that resonate deeply with consumers. As digital platforms continue to evolve, leveraging emotional engagement offers a strategic advantage in influencing consumer behavior.

H5: Consumer emotional engagement has a significant effect on consumer decision-making.
H6: Consumer emotional engagement mediates the relationship between neuromarketing tools and techniques and consumer decision-making.
H7: Consumer emotional engagement mediates the relationship between virtual reality experience and consumer decision-making.

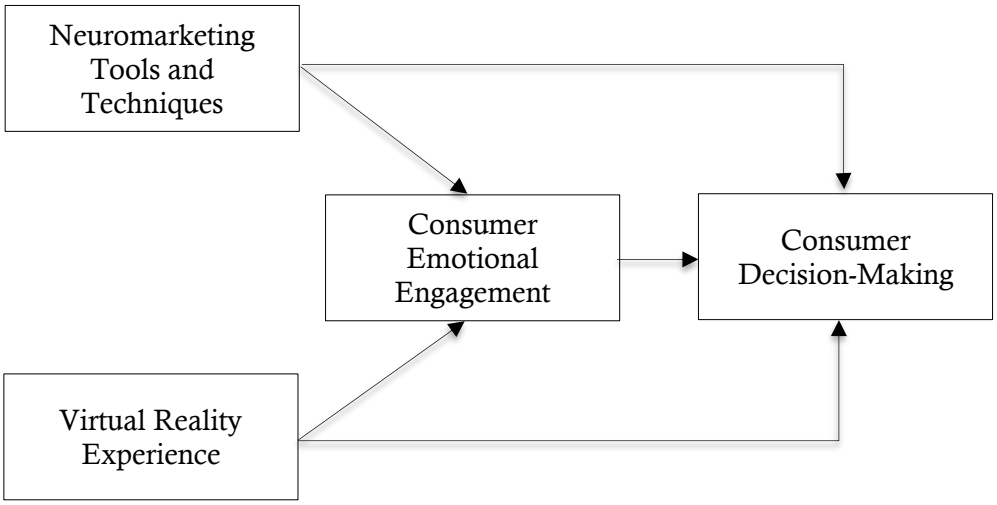

Figure 1. Research Framework

The research framework in Figure 1 illustrates the relationship between the use of neuromarketing tools and techniques and virtual reality (VR) experiences on consumer emotional engagement and decision making. In this framework, both neuromarketing and

VR are assumed to have a direct influence on emotional engagement and consumer decisions. In addition, emotional engagement acts as a mediating variable that bridges the influence of technology on consumer decisions, indicating that affective responses play a significant role in the decision-making process. Through this approach, the framework highlights the importance of the interaction between marketing technology and psychological aspects in shaping consumer behavior in the digital era.

RESEARCH METHOD

This study used a quantitative research design to investigate the factors that influence consumer decision-making among Shopee users, with a particular focus on college students as a significant segment of the e-commerce consumer base. A sample of 100 college students in Medan City was selected using purposive sampling to ensure that participants were active Shopee users. College students are considered to represent digital natives who frequently engage in online shopping, making them a relevant and insightful demographic for this study. Data were collected using a structured questionnaire designed to measure the relationship between variables such as neuromarketing tools, virtual reality experiences, emotional engagement, and consumer decision-making.

Constructs were operationalized based on established scales from previous literature, ensuring validity and reliability of the content. Each item in the questionnaire was adapted and validated through pilot testing to enhance clarity and relevance to the target respondents. For data analysis, Smart PLS (Partial Least Squares Structural Equation Modeling), a variance-based SEM tool, was used due to its robustness in handling small sample sizes and its ability to model complex relationships among latent variables. Smart PLS allows simultaneous testing of measurement and structural models, making it suitable for evaluating direct and indirect effects, including the mediating role of emotional engagement.

The choice of Smart PLS is in line with its increasing application in e-commerce research, where user behavior often involves multifaceted interactions between psychological and technological factors. This analytical method is particularly effective in exploratory research contexts, allowing the identification of key determinants and pathways that influence consumer decisions in online environments. Furthermore, ethical considerations were strictly adhered to throughout the research process. Informed consent was obtained from all participants, and confidentiality of responses was maintained to protect participant privacy. This methodological approach ensures a rigorous examination of the interactions between neuromarketing, virtual reality, emotional engagement, and consumer behavior in the context of digital commerce.

RESULTS

The data analysis process in this study utilized Smart PLS, a variance-based structural equation modeling (SEM) tool, to rigorously assess the validity and reliability of the measurement model before advancing to hypothesis testing. This approach ensures that the latent variables and their associated indicators accurately reflect the theoretical constructs being examined. Convergent validity was established by evaluating factor loadings, average variance extracted (AVE), and composite reliability (CR). The results demonstrated that all factor loadings exceeded the recommended threshold of 0.7, AVE values were above 0.5, and CR values surpassed 0.7, indicating that the indicators effectively represent their respective constructs (Hair et al., 2019). To further verify the distinctiveness of each construct, discriminant validity was examined using the Fornell-Larcker criterion and cross-loading analysis. The Fornell-Larcker results showed that the square root of AVE for each construct was greater than its correlations with other constructs, fulfilling the criterion for discriminant validity. Additionally, cross-loadings confirmed that each indicator loaded more highly on its corresponding construct than on any other, ensuring that the constructs measure different concepts (Tenenhaus et al., 2005). The internal consistency reliability of each construct was assessed through Cronbach's alpha and composite reliability, both of which exceeded the acceptable

threshold of 0.7. This demonstrates that the indicators within each construct consistently measure the same underlying concept and that the measurement model is stable (Henseler et al., 2009).

Table 1. Direct Effect

Path	Coefficient	P-value	Result
NTT -> CEE	0.650	0.001	Significant
NTT -> CDM	0.480	0.023	Significant
VRE -> CEE	0.720	0.000	Significant
VRE -> CDM	0.320	0.075	Not Significant
CEE -> CDM	0.590	0.004	Significant

Table 1 shows the direct impact of Neuromarketing Tools and Techniques (NTT) on Consumer Emotional Engagement (CEE) and Consumer Decision Making (CDM), highlighting the important role of neuroscience-based marketing methods in shaping consumer behavior. The path coefficient from NTT to CEE is 0.650 with a p-value of 0.001, indicating a strong and statistically significant relationship. This suggests that technologies such as electroencephalography (EEG), functional magnetic resonance imaging (fMRI), and eye-tracking are effective in enhancing emotional responses among consumers. These tools provide marketers with deeper insights into the subconscious elements of consumer behavior, allowing for the creation of emotionally resonant marketing strategies. These results demonstrate the potential of neuroscience in uncovering hidden cognitive and emotional responses that traditional methods may overlook. Furthermore, NTT also showed a significant direct effect on CDM, with a coefficient of 0.480 and a p-value of 0.023. This suggests that beyond emotional influences, neuromarketing tools can directly shape consumer choices by leveraging neural and psychological triggers. These results emphasize the strategic value of neuromarketing in influencing decisions through emotional and neurological mechanisms.

Therefore, the relationship between VRE and CEE is highly significant, with a coefficient of 0.720 and a p-value of 0.000, indicating that immersive VR experiences greatly enhance consumers' emotional connection with a product or brand. This finding emphasizes that virtual simulations can foster a greater sense of authenticity and emotional attachment, helping consumers feel more engaged and connected to a brand. VR's ability to create a vivid sense of presence immerses users in the simulated environment, making the interaction more memorable and emotionally impactful. In contrast, while the effect of VRE on CDM shows a positive coefficient of 0.320, the relationship is not statistically significant ($p = 0.075$). This suggests that VR experiences alone may not be enough to directly influence consumers' purchasing decisions. Instead, the impact of VR on decision-making is likely dependent on other mediating factors, such as emotional engagement. This suggests that VR's main strength lies in its capacity to build emotional connections with consumers, rather than directly driving immediate purchasing behavior. Essentially, VR serves as a powerful tool to enrich consumers' emotional experiences, which can further influence decision-making when combined with other factors. Therefore, marketers looking to use VR technology should focus on how immersive experiences can deepen emotional engagement to indirectly shape consumer choices.

Furthermore, the analysis shows that Consumer Emotional Engagement (CEE) has a significant positive effect on Consumer Decision Making (CDM), with a coefficient of 0.590 and a p-value of 0.004. These results highlight the important role that emotional engagement plays in influencing consumer purchasing behavior. When consumers develop a strong emotional connection with a brand, they are more likely to demonstrate loyalty, effectively recall brand messages, and proceed with purchase decisions. These findings emphasize that emotional engagement acts as a key psychological mechanism that translates marketing efforts into meaningful consumer actions. Emotional bonds

strengthen the relationship between consumers and brands, increasing the likelihood of repeat purchases and positive word-of-mouth. Therefore, marketers should prioritize strategies that foster emotional connections to improve decision-making outcomes and build long-term customer relationships.

Table 2. Indirect Effect

Path	Coefficient	P-value	Result
NTT -> CEE -> CDM	0.380	0.002	Significant
VRE -> CEE -> CDM	0.250	0.048	Significant

The indirect effect analysis in Table 2 shows that Consumer Emotional Engagement (CEE) significantly mediates the relationship between Neuromarketing Tools and Techniques (NTT) and Consumer Decision-Making (CDM), as indicated by the path coefficient of 0.380 and a p-value of 0.002. This suggests that NTT influence decision-making not only directly but also indirectly by enhancing emotional engagement, which in turn drives consumer behavior. The result reinforces the notion that emotional engagement is a central mechanism through which neuromarketing exerts its impact, underscoring the importance of designing marketing stimuli that evoke strong emotional responses to effectively guide purchasing decisions.

The indirect effect analysis also reveals a significant mediating role of Consumer Emotional Engagement (CEE) in the relationship between Virtual Reality Experience (VRE) and Consumer Decision-Making (CDM), with a path coefficient of 0.250 and a p-value of 0.048. Although the direct effect of VRE on CDM was not statistically significant, this result highlights that VRE can still positively influence consumer decisions through its impact on emotional engagement. This finding supports the idea that the true value of VR in marketing lies in its capacity to create emotionally immersive experiences, which subsequently shape consumer judgments and actions, making CEE a crucial conduit for the effectiveness of VR strategies.

DISCUSSION

Based on the findings of this study, several important insights emerge regarding the role of neuromarketing tools and techniques (NTT) and virtual reality experiences (VRE) in influencing consumer emotional engagement (CEE) and consumer decision-making (CDM). The results underscore the transformative impact of technology-driven marketing strategies in shaping consumer behavior, particularly through emotional and psychological pathways. The significant direct relationship between NTT and CEE (coefficient = 0.650, p = 0.001) confirms that neuroscience-based tools such as EEG, fMRI, and eye-tracking are highly effective in stimulating emotional responses among consumers. These tools help marketers gain access to the subconscious reactions of consumers, enabling the design of emotionally rich marketing messages. As supported by Hubert and Kenning (2008) and Çerçi (2024), such technologies provide deeper insights into cognitive and affective responses that are often inaccessible through traditional marketing methods. This suggests that neuromarketing offers a more precise and powerful approach to understanding and influencing consumer behavior by targeting the emotional triggers that underlie decision-making. In addition to this, the direct effect of NTT on CDM is also statistically significant (coefficient = 0.480, p = 0.023), indicating that the influence of neuromarketing extends beyond emotional arousal to actual purchasing behavior. This finding is consistent with the work of Plassmann et al. (2015), who argued that neuromarketing strategies leverage emotional and neurological responses to shape consumer choices more effectively. By tapping into brain-based cues and behavioral patterns, neuromarketing allows brands to create persuasive, personalized campaigns that can directly impact consumer decision-making processes.

Regarding virtual reality experience, the results show a strong and significant direct effect on CEE (coefficient = 0.720, p = 0.000), affirming VR's capacity to foster emotional involvement through immersive experiences. As suggested by Kim (2017), VR

environments simulate real-world scenarios that enhance the authenticity of brand interactions, increasing consumers' emotional connection and sense of presence. This immersive quality makes VR a compelling tool in experiential marketing, where creating lasting impressions and emotional resonance is key to influencing consumer perceptions. However, the direct effect of VRE on CDM was not statistically significant (coefficient = 0.320, p = 0.075), indicating that while VR can create rich emotional experiences, these do not immediately or independently translate into purchase decisions. This finding aligns with Flavián et al. (2019), who argue that VR's primary strength lies in its ability to foster emotional engagement rather than directly triggering consumer actions. Therefore, while VR enhances emotional dimensions of brand interaction, it must be complemented by other factors especially emotional engagement to impact decision-making behavior.

The significance of CEE as a mediating variable becomes apparent in the indirect effect analysis. CEE significantly mediates the relationship between NTT and CDM (coefficient = 0.380, p = 0.002), suggesting that one of the key ways neuromarketing influences consumer decisions is through emotional engagement. This pathway emphasizes the importance of designing marketing stimuli that evoke strong emotional reactions, which then guide consumers toward specific behavioral outcomes. In other words, emotional engagement acts as the bridge through which neuromarketing transforms cognitive insights into actionable marketing strategies. Similarly, CEE mediates the relationship between VRE and CDM (coefficient = 0.250, p = 0.048), reinforcing the notion that the true value of VR in marketing lies in its capacity to generate emotional depth. Even though VRE alone does not significantly impact CDM, its indirect effect through CEE is meaningful. This finding illustrates the layered influence of immersive technologies, where the emotional response they evoke becomes the mechanism driving consumer choices. Thus, marketers using VR should focus not only on novelty or interactivity but also on how immersive content can forge deeper emotional connections.

CONCLUSION

This study highlights the critical role of neuromarketing tools and virtual reality experiences in shaping consumer decision-making, with consumer emotional engagement emerging as a key mediator. Findings suggest that neuromarketing tools exert significant direct and indirect effects on consumer decision-making by activating subliminal and emotional responses. In contrast, virtual reality experiences primarily impact consumer decision-making indirectly through consumer emotional engagement, despite not having a significant direct effect, underscoring its capacity to foster deep emotional connections. The substantial impact of consumer emotional engagement on consumer decision-making highlights its role as a key mechanism linking technological stimuli to behavioral outcomes. These results extend the theoretical understanding of consumer behavior by integrating neuromarketing and virtual reality experiences into a unified framework, emphasizing emotional engagement as a channel for effective marketing strategies. Practically, these findings suggest the strategic integration of emotionally resonant technologies to enhance consumer relationships and optimize decision-making outcomes in the context of digital marketing. However, this study also has limitations including the study's focus on a specific demographic (college students in Medan City) and its modest sample size (n = 100). Thus, it is recommended that future research explore diverse populations, larger samples, and longitudinal designs to validate these findings and address the ethical and cultural dimensions of neuromarketing tool applications and virtual reality experiences. This study contributes new insights to the growing discourse on technology-driven marketing, offering a foundation for theoretical advances and practical innovations in fostering consumer engagement.

REFERENCES

[1] Archana, C., & Mahajan, A. (2023). Neuro marketing: An astonishing addition to the marketing world. In *Digital transformation for business sustainability: Trends, challenges and opportunities*. Singapore: Springer Nature Singapore.

[2] Bettman, J. R., Luce, M. F., & Payne, J. W. (1998). Constructive consumer choice processes. *Journal of Consumer Research*, *25*(3), 187-217.

[3] Bhardwaj, S., Thapa, S. B., & Gandhi, A. (2024). Advances in neuromarketing and improved understanding of consumer behaviour: analysing tool possibilities and research trends. *Cogent Business & Management*, *11*(1), 2376773-2376794.

[4] Buhrau, D., & Sujan, M. (2015). Temporal mindsets and self-regulation: The motivation and implementation of self-regulatory behaviors. *Journal of Consumer Psychology*, *25*(2), 231-244.

[5] Cartwright, E. (2024). *Behavioral economics*. London: Routledge.

[6] Cenizo, C. (2022). Neuromarketing: concepto, evolución histórica y retos. *Icono14*, *20*(1), 11.

[7] Çerçi, H. S. (2024). Neuromarketing and marketing communications an integrated approach to understanding consumer behavior. *Uluslararasi Akademik Birikim Dergisi*, *7*(3), 426-437.

[8] Cruz, C. M. L., Medeiros, J. F. D., Hermes, L. C. R., Marcon, A., & Marcon, É. (2016). Neuromarketing and the advances in the consumer behaviour studies: a systematic review of the literature. *International Journal of Business and Globalisation*, *17*(3), 330-351.

[9] Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., ... & Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, *59*(3), 102168-102205.

[10] Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2019). The impact of virtual, augmented and mixed reality technologies on the customer experience. *Journal of Business Research*, *100*(3), 547-560.

[11] Grewal, D., & Roggeveen, A. L. (2020). Understanding retail experiences and customer journey management. *Journal of Retailing*, *96*(1), 3-8.

[12] Gultom, P., Sipayung, A. B. R., & Hasibuan, G. A. A. (2024). The effect of work discipline, motivation, and work stress on employee job satisfaction. *Jurnal Ilmiah Akuntansi Kesatuan*, *12*(5), 669–676.

[13] Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2-24.

[14] Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). *The use of partial least squares path modeling in international marketing.* Bradford: Emerald Group Publishing Limited.

[15] Horsley, M., Eliot, M., Knight, B. A., & Reilly, R. (Eds.). (2014). *Current trends in eye tracking research*. New York: Springer International Publishing.

[16] Hsu, L., & Chen, Y. J. (2020). Neuromarketing, subliminal advertising, and hotel selection: An EEG study. *Australasian Marketing Journal*, *28*(4), 200-208.

[17] Hubert, M., & Kenning, P. (2008). A current overview of consumer neuroscience. *Journal of Consumer Behaviour: An International Research Review*, *7*(4), 272-292.

[18] Javornik, A. (2016). Augmented reality: Research agenda for studying the impact of its media characteristics on consumer behaviour. *Journal of Retailing and Consumer Services*, *30*(3), 252-261.

[19] Kenning, P., & Linzmajer, M. (2011). Consumer neuroscience: An overview of an emerging discipline with implications for consumer policy. *Journal für Verbraucherschutz und Lebensmittelsicherheit*, *6*(1), 111-125.

[20] Kim, E. (2017). *Unmuting voices: Dayak women's narratives on structural and gendered injustice in oil palm expansion in West Kalimantan, Indonesia*. Venezia: Global Campus (Doctoral dissertation).

[21] Kinzinger, A., Steiner, W. J., Tatzgern, M., & Vallaster, C. (2025). Interactive product presentation in an immersive environment: The influence of functional control on hedonic aspects. *Journal of Retailing and Consumer Services*, *83*(3), 104156- 104170.

[22] Kong, L., Hu, K., & Walsman, M. (2021). Caring for an aging population in a post-pandemic world: Emerging trends in the US older adult care industry. *Service Science*, *13*(4), 258-274.

[23] Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, *80*(6), 69-96.

[24] Mirbagheri, S., & Najmi, M. (2019). Consumers' engagement with social media activation campaigns: Construct conceptualization and scale development. *Psychology & Marketing*, *36*(4), 376-394.

[25] Ngo, T. T. A., Tran, T. T., An, G. K., & Nguyen, P. T. (2025). Investigating the influence of augmented reality marketing application on consumer purchase intentions: A study in the E-commerce sector. *Computers in Human Behavior Reports*, *18*(3), 100648.

[26] Oliveira, P. M., Guerreiro, J., & Rita, P. (2022). Neuroscience research in consumer behavior: A review and future research agenda. *International Journal of Consumer Studies*, *46*(5), 2041-2067.

[27] Pansari, A., & Kumar, V. (2017). Customer engagement: the construct, antecedents, and consequences. *Journal of the Academy of Marketing Science*, *45*(3), 294-311.

[28] Pantano, E., & Servidio, R. (2012). Modeling innovative points of sales through virtual and immersive technologies. *Journal of Retailing and Consumer Services*, *19*(3), 279-286.

[29] Pedol, M., Biffi, E., & Melzi, S. (2021). Sustainability game. *Corporate Social Responsibility and Environmental Management*, *28*(5), 1540-1548.

[30] Plassmann, H., Venkatraman, V., Huettel, S., & Yoon, C. (2015). Consumer neuroscience: applications, challenges, and possible solutions. *Journal of Marketing Research*, *52*(4), 427-435.

[31] Puente-Torre, P., Delgado-Benito, V., Rodríguez-Cano, S., & García-Delgado, M. Á. (2024). Virtual reality as an interactive tool for the implementation of mindfulness in university settings: A systematic review. *Multimodal Technologies and Interaction*, *8*(10), 89-107.

[32] Rendragraha, N. D., & Suwaji, R. (2024). The influence of rewards and punishment on the performance of employees in industrial sector companies. *Jurnal Ilmiah Manajemen Kesatuan*, *12*(4), 1091–1100.

[33] Romano, B., Sands, S., & Pallant, J. I. (2021). Augmented reality and the customer journey: An exploratory study. *Australasian Marketing Journal*, *29*(4), 354-363.

[34] Siebert, A., Gopaldas, A., Lindridge, A., & Simões, C. (2020). Customer experience journeys: Loyalty loops versus involvement spirals. *Journal of Marketing*, *84*(4), 45-66.

[35] Silva, M. J., Costa, M. F. D., de Farias, S. A., & Wanderley, L. S. (2020). Who is going to save the Brazilian Amazon forest? Reflections on deforestation, wildlife eviction, and stewardship behavior. *Psychology & Marketing*, *37*(12), 1720-1730.

[36] Stankevich, A. (2017). Explaining the consumer decision-making process: Critical literature review. *Journal of International Business Research and Marketing*, *2*(6), 7-14.

[37] Sujana, S., & Yusni, Y. (2024). The influence of service quality and price perceptions on customer loyalty and customer satisfaction as intervening variables. *Jurnal Ilmiah Manajemen Kesatuan*, *12*(4), 1165–1178.

[38] Tenenhaus, M., Vinzi, V. E., Chatelin, Y. M., & Lauro, C. (2005). PLS path modeling. *Computational Statistics & Data Analysis*, *48*(1), 159-205.

[39] Xi, N., & Hamari, J. (2021). Shopping in virtual reality: A literature review and future agenda. *Journal of Business Research*, *134*(3), 37-58.

[40] Xi, N., Chen, J., Gama, F., Korkeila, H., & Hamari, J. (2024). Acceptance of the metaverse: A laboratory experiment on augmented and virtual reality shopping. *Internet Research*, *34*(7), 82-117.

[41] Yan, X., Liu, Y., Liu, T., & Chen, Y. (2025). Research on the mechanism of social emotion formation in public emergencies based on the degroot model. *Mathematics*, *13*(6), 1-31.

[42] Yung, R., Khoo-Lattimore, C., & Potter, L. E. (2021). Virtual reality and tourism marketing: Conceptualizing a framework on presence, emotion, and intention. *Current Issues in Tourism*, *24*(11), 1505-1525.

[43] Zhang, Y., Thaichon, P., & Shao, W. (2023). Neuroscientific research methods and techniques in consumer research. *Australasian Marketing Journal*, *31*(3), 211-227.