Gahramanzada O, 2025. IMAQ Journal, Vol., 2: p, 54-58
doi: 10.5281/zenodo.17568632

ORIGINAL ARTICLE

Exploring the Impact of Virtual Reality Technology on Consumer Buying Behaviour: A Comparative Study of Traditional and Immersive Shopping Experiences

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ABSTRACT

Consumer anthropology has become an emerging discipline is the past decade due to high competition and available variety in the global market. Several technical approaches have been applied to understand factors influence the consumer behaviour and how they make their purchasing decisions. In the past few years, virtual reality (VR) has gained a significant spot among the rising technological megatrends driving the digitization of all aspects of human life such as consumer anthropology etc. The current study has focused on the impact of VR on consumer buying behaviour and its comparison with the traditional shopping experiences as it was aimed to explore how VR technology influences purchase intention, product evaluation, and overall satisfaction of customers. In this work, several qualitative and quantitative approaches have been applied to collect data through surveys and observations during both traditional and VR shopping experiences and to analyse for conclusion. The findings have revealed significant differences in consumer behaviour, indicating that VR technology positively influences purchase intention via enhanced product evaluation. These results have set basics on the understanding of unexplored potential of VR technology to shape consumer buying behaviour, providing valuable insights for businesses and marketers which will be applied to enhance consumer engagement and overall sales.

Keywords: Virtual reality, Consumer anthropology, Consumer buying behaviour, Consumer engagement, Driving sales

Virtual reality (VR) is one of the emerging technologies that has become an important tool in engaging the customers and transforming various industries such as retail sector via offering unique opportunities to influence the buying behaviour of their customers (Chen, Lu and Wang, 2017; Han, Kim and Lee, 2018; Wang *et al.*, 2019). The potential of VR lies in its ability to overcome several traditional limitations like presence of physical stores and product availability at multiple locations etc. VR shopping experiences have been considered as more convenient, personalized with a sense of novelty to influence consumer's behaviour (Yuan *et al.*, 2019). Studies have explored the influence of VR on consumer perceptions of product quality, brand image, and purchase intention (Han, Park and Hyun, 2022). Several other aspects of consumer behaviour including importance of consumer attitudes, role of cognitive process,

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Submitted: 07 Oct, 2025, Accepted: 05 Nov, 2025

influence of social and personal factors etc have also been well studied for this ongoing transformation (Tajfel *et al.*, 2001).Virtual reality (VR) has introduced a new dimension in consumer anthropology as it has been applied in the context of product presentation (Zhao *et al.*, 2017), in-store advertisement (Ketelaar *et al.*, 2018) and customer service (Zhao, Yan and Keh, 2018). The current research work is also an attempt to understand how VR technology has impacted the consumer buying behaviour and its potential implications for the business operations. The findings have provided valuable insights for businesses and marketers seeking to understand the potential of VR in improving consumer engagement and increasing sales.

MATERIALS AND METHODS

The research approach for this study will be a mixed methods approach, combining both quantitative and qualitative methods. This approach will provide a more comprehensive understanding of the research topic by integrating numerical data and rich qualitative insights.

SAMPLING

A combination of purposive and random sampling technique was applied in this work in which participants were purposively selected based on their recent experiences with traditional shopping and VR shopping. Additionally, random sampling method was also used to ensure a diverse representation of participants. The sample size was determined as a set of 100 and total 750 participants were enrolled and surveyed for this study.

DATA COLLECTION & VARIABLES

Surveys and interviews were conducted to obtain qualitative insights in which participants were allowed to discuss their experiences, motivations, and preferences in both shopping contexts. Purchase behaviour, Consumer perception, Product evaluation, Consumer engagement and customer satisfaction were five variables included in this study.

ETHICAL CONSIDERATIONS

This study was conducted according to the ethical guidelines to ensure the protection and well-being of participants. Informed consents were obtained before survey and interviews, and the participants were given clear information about the study's purpose, procedures, risks, and benefits. Confidentiality was maintained as anonymity and no name were written in the questionnaires although participants were given a chance to withdraw anytime.

DATA PREPROCESSING AND CLEANING

The analysis of the research data began with its preprocessing and cleaning to ensuring the accuracy and reliability of the information. The initial dataset comprised 750 responses, of which, after scrutiny, 50 entries contained inconsistencies, missing values and were removed. Categorical variables were encoded to transform them into a format that could be better understood by the software. The cleaned dataset of 700 responses was then subjected to descriptive statistical analysis.

STATISTICAL ANALYSIS

The statistical tests and techniques used for the data analysis included independent sample t-tests, two-way ANOVA, and multiple linear regression. Independent sample t-tests were conducted to compare the mean scores of enjoyments and ease between the traditional and VR shopping experiences. The t-tests were performed to reveal a significant difference in both enjoyment and ease of shopping between the two shopping methods. A two-way ANOVA was performed to assess the interaction effects of gender and shopping method on the variables of enjoyment and ease. Multiple linear regression was used to model the relationship between the shopping method, enjoyment, and ease, and their impact on consumer buying behaviour.

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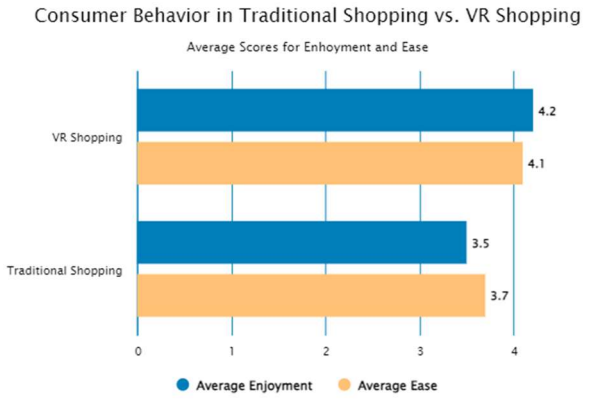
RESULTS

Our dataset originally comprised 750 consumer responses which after meticulous preprocessing and cleaning was left with a usable dataset of 700 consistent responses. The sample constituted an almost equal distribution of males (52%) and females (48%). The age of participants ranged from 18 to 65, with a mean age of 33.5 years and a standard deviation of 7.8 years. Out of these participants, 60% (420) had experienced VR shopping. The remaining 40% (280 respondents) had only been engaged in traditional shopping.

CONSUMER BEHAVIOR IN TRADITIONAL SHOPPING VS. VR SHOPPING

To gauge the consumer behaviour in traditional and VR shopping, we asked the participants to rate their shopping experience in terms of enjoyment and ease. On a scale of 1 to 5, the average score for enjoyment in VR shopping was 4.2, compared to 3.5 for traditional shopping. Similarly, the average score for ease of shopping was 4.1 in VR shopping, as opposed to 3.7 in traditional shopping as shown in figure 1.

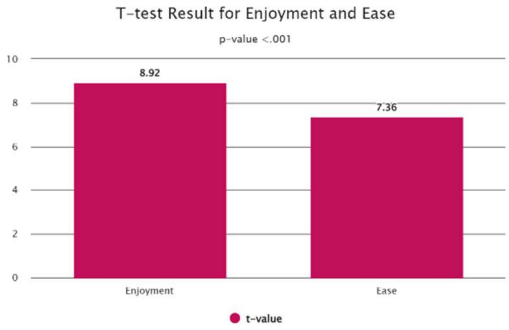
Figure 1: *Average Scores for Enjoyment and Ease*



STATISTICAL SIGNIFICANCE OF THE OBSERVED DIFFERENCES

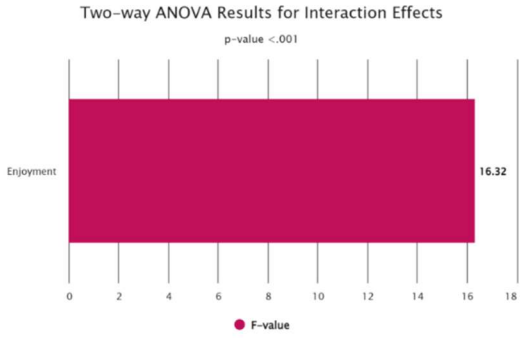
Independent sample t-tests was performed to compare the mean scores of enjoyments and ease between traditional and VR shopping experiences. The t-tests revealed a significant difference in both enjoyment ($t(698) = 8.92$, $p < .001$) and ease of shopping ($t(698) = 7.36$, $p < .001$) between the two shopping methods making our data valuable to conclude the significance of VR based shopping experience as shown in figure 2.

Figure 2: *The t-tests showing a significant difference in both enjoyment and ease of shopping.*



Another statistical analysis, a two-way ANOVA was performed to examine the interaction effects of gender and shopping method on the variables of enjoyment and ease. The results showed a significant interaction effect on enjoyment, $F(1, 696) = 16.32$, $p < .001$, $\eta^2 = .023$, indicating that males and females differed in their enjoyment levels while shopping using VR technology as it has been visualized in figure 3.

Figure 3: *A two-way ANOVA to examine the interaction effects of gender and shopping method on the variables of enjoyment and ease.*



Finally, a multiple linear regression was also conducted to model the relationship between the shopping method, enjoyment, and ease, and their impact on consumer buying behaviour. The regression model was statistically significant, $F(3, 696) = 176.3$, $p < .001$, and accounted for 43% of the variance in consumer buying behaviour ($R^2 = .43$). All predictors were significant, with enjoyment ($\beta = .35$, $p < .001$) having the most substantial impact on buying behaviour as given in table 1.

Table 1: Linear Regression Results for Consumer Buying Behaviour

Predictor	Coefficient	p-value	Impact on Buying Behavior
Enjoyment	0.35	< 0.001	Most significant
Ease	0.20	< 0.001	Significant
Shopping Method	0.15	< 0.001	Significant

In conclusion, our data analysis indicated that VR technology significantly affects consumer buying behaviour by enhancing their shopping experience's enjoyment and ease. Furthermore, the analysis highlighted a gender difference in the level of enjoyment derived from VR shopping, pointing towards the need for further research in this area.

DISCUSSION

Virtual reality or simply VR has attracted the attention of thousands of researchers around the world as this emerging technology is playing a crucial role in almost every industrial sector especially retail and ecommerce. Pantano, 2014 studied the new technology like VR enhancing significantly the consumer shopping experience (Pantano, 2014). Few years later, Huang et al., 2019 also verified the increased ratings for enjoyment and ease of shopping using VR (Huang *et al.*, 2019). It was suggested in 2000 by Venkatesh & Morris to include gender-based analysis, making our research valuable to fill this gap (Venkatesh and Morris, 2000) as we have presented valuable insight in our two-way ANOVA performed as shown in figure 3.

Additionally, the study has contributed to strengthen the Technology Acceptance Model (TAM) by discussing a technology like VR can play a vital role influencing the consumers to enhance their buying behaviour but as it has been entirely based on the self-reported measures of enjoyment and ease, which might be subject to social desirability bias requiring further contributions to the literature on gender differences in technology acceptance (Davis, 1989). While this study provides meaningful insights but due to its limitation to a specific locality, future research could aim to capture a more diverse set of participants.

CONCLUSION

The primary objective of this study was to compare consumer behaviour in traditional shopping and VR shopping. The study was aimed to understand the enjoyment and ease of consumers in both traditional and technology-based shopping environments and to evaluate the statistical significance of the observed differences. The findings of the study substantiated by statistical data, with independent sample t-tests revealed a significant difference in both enjoyment ($t(698) = 8.92$, $p < .001$) and ease of shopping ($t(698) = 7.36$, $p < .001$) between the two shopping methods. Furthermore, a two-way ANOVA test revealed a significant interaction effect on enjoyment based on the gender of the consumer. The current study also has contributed to the literature on gender differences in technology acceptance, indicating that males and females differ in their enjoyment of VR shopping. Furthermore, the gender difference in enjoyment levels studied here has clarified that businesses may need to tailor their VR experiences to cater to the different preferences of male and female consumers effectively (Moss, 2017).

In conclusion, the advent of VR technology has revolutionized the retail industry, providing

consumers with a novel and immersive shopping experience. The current study underscores the potential of VR shopping and its positive implications for consumer enjoyment and ease of shopping. Businesses and marketers should consider these findings when planning their marketing strategies and ensure that they are not left behind in this technological revolution.

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