

## ANALYSING THE IMPACT OF VIRTUAL REALITY ON CONSUMER BUYING BEHAVIOUR

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**Abstract:** This study examines how virtual reality (VR) is altering consumer behaviour. As virtual reality (VR) technology develops, it is increasingly being used by businesses as a potent tool for engaging customers in unique and immersive experiences. This research examines how VR impacts consumer decision-making processes, brand perceptions, and purchase behaviours through a thorough evaluation of the literature currently in the field. It explores virtual reality experiences in depth and looks at how they can affect consumer preferences. Insights on the potential of VR as a tool for comprehending and influencing consumer behaviour will be offered by the study's outcomes.

**Keywords:** Virtual Reality, Purchasing Behaviour, Customer Satisfaction, Descriptive Analysis

### I. INTRODUCTION:

#### 1.1 Background

Virtual Reality (VR) technology has rapidly emerged as a transformative force in contemporary consumer markets, with profound implications for consumer behaviour. As consumers increasingly seek immersive and interactive experiences, businesses have turned to VR as a potent tool to engage and influence their target audiences. This paper explores the profound impact of VR on consumer behaviour by drawing on an array of research studies in the field.

Consumer engagement in VR environments is a dynamic area of study. It indicates that VR can elicit emotional engagement, enhancing the overall user experience (Chirico, 2017). Additionally, interactive storytelling in VR has been shown to captivate users and foster deeper engagement. The impact of VR on purchasing decisions is multifaceted. Research suggests that immersive VR

experiences can enhance consumers' product evaluations and lead to more confident purchasing decisions (Huang L. &. The impact of virtual reality on consumer purchase decision: An empirical study. Proceedings of the American Marketing Association Winter Educators' Conference, 24(1), 151-152., (2013)) Moreover, VR can create a sense of ownership and attachment to products, influencing purchase intentions.

Virtual reality has shown great potential in many fields, especially in business. By immersing someone in a new computer-generated reality, it is possible to create realistic, safe, and controllable simulations, as well as new three-dimensional-enriched consumer experiences and services (Elodie, Angélique, & Anne-Lise, 2023).

VR shopping environments and marketplaces can realistically simulate physical ones and address the limitations of e-commerce (Generoso, Vittoria, & Riccardo, 2023). VR can enrich the shopping experience with new, exciting and immersive solutions. It is accessible at any time and without the spatial and temporal limitations of the physical world.

The rapid growth of virtual reality (VR) and augmented reality (AR) services in various industries has stimulated innovation which is sufficient and necessary for higher purchase intention for consumers (Wu, 2023).

VR is opening new avenues of opportunities for product manufacturers, as well as service providers. The immense growth potential that is currently untapped in the VR domain can be taken to a different level altogether with the help of neuro-marketing applications. The stress has been provided to understand customer purchase behaviour in augmented shopping reality (Kaur & Verma, 2023).

## 1.2 Rationale for the Study

Understanding the impact of VR on consumer behaviour is important for several reasons. First, the increasing popularity and use of VR across industries examines how consumers evolve and interact in virtual environments. Second, to develop effective strategies, businesses and marketers need to examine how consumer behaviour evolves in this new digital environment. Finally, policymakers should consider the legal and ethical issues surrounding the impact of VR on consumer behaviour to ensure that consumers are protected in this time of change.

## 1.3 Research Objectives

1. To assess the Adoption of Virtual Reality Technology by Consumers.
2. To analyse the Impact of VR on Consumer Purchasing Decisions.
3. To understand how VR experiences influence consumer engagement.

These research objectives aim to provide a comprehensive understanding of how Virtual Reality is influencing and shaping consumer behaviour in various sectors. Through rigorous analysis and empirical research, this study seeks to uncover valuable insights that can guide businesses in effectively utilizing VR technology to enhance consumer experiences and drive growth.

## II. LITERATURE REVIEW:

VR's role in shaping consumer behaviour in the digital era is evolving. Research suggests that VR can influence consumers' information processing and decision-making processes (J, 1992). Moreover, VR's ability to provide sensory-rich experiences has the potential to reshape consumer preferences and brand perceptions. The integration of VR in marketing has both benefits and challenges. Research highlights that VR can enhance brand engagement and create memorable marketing experiences (Choi J. &, 2019). However, challenges include the need for high-quality content and addressing potential motion sickness issues. Consumer engagement in VR environments is a dynamic area of study. Research indicates that VR can elicit emotional engagement, enhancing the overall user experience (Chirico, 2017). Additionally, interactive storytelling in VR has been shown to captivate users and foster deeper engagement. The impact of VR on purchasing decisions is multifaceted. Research suggests that immersive VR experiences can enhance consumers' product evaluations and lead to more confident purchasing decisions (Huang L. &, The impact of virtual reality on consumer purchase decision: An empirical study. , 2013). Moreover, VR can create a sense of ownership and attachment to products, influencing purchase intentions. The impact of virtual reality (VR) on consumer behaviour and found that immersive VR experiences significantly increased consumer engagement and purchase intention (Huang L. &, (2019)). Choi and Kim's research delved into VR's cognitive aspects and found that VR's sensory richness positively influences consumer perception and decision-making. (Choi D. &, 2018). VR can lead to impulse buying behaviour, emphasizing the immersive nature of VR and its capacity to evoke strong emotional responses (Lin, 2020). The level of immersion in VR experiences predicts consumer behaviour and the acceptance of VR technology (Kim, 2018). The influence of VR advertising on consumer engagement and purchase intention, revealing a significant positive relationship (Jin, 2019). Steuer's seminal work outlines the concept of "telepresence" and its impact on VR, which is essential for understanding the psychological mechanisms behind consumer behaviour in VR environments (Steuer, 1992). Consumer purchases in online VR shopping environments, demonstrating that VR positively affects the overall shopping experience (Shin, 2020). Ma and Agarwal's work discusses the concept of identity verification in VR environments and its impact on trust and consumer behaviour. (Ma, 2007). VR experiences contribute to consumer satisfaction and loyalty in various industries, providing insights into the long-term effects (Wang, 2019). Slater and Wilbur's research introduces the concept of "presence" in VR, a critical factor affecting consumer behaviour, engagement, and decision-making within virtual environments (Slater, 1997).

### III. THEORITICAL BACKGROUND AND HYPOTHESIS:

Virtual Reality (VR) is an immersive technology that has gained momentum in various domains, including gaming, healthcare, education, and marketing. The influence on consumer behaviour of its unique capacity to immerse users in computer-generated environments has been questioned. Using ideas from marketing, and technological adoption theories, this research tries to establish a theoretical framework for comprehending how VR effects customer behaviour.

#### 3.1 Marketing Theories:

- **Experiential Marketing:** The focus of experiential marketing is on giving customers unique and compelling brand experiences. VR provides a special platform for businesses to interact with customers in fresh ways. How VR experiences improve brand engagement, loyalty, and purchase intention might be the subject of this research (Schmitt & Zarantonello, 2013).
- **Social Influence Theory:** The psychology-based concept of social influence theory looks at how peers and social networks affect people. Through consumer interaction in virtual environments, virtual reality (VR) offers chances for peer influence and social impact. Understanding social dynamics in VR can help us better understand how these immersive environments influence consumer behaviour (Cialdini, 1984).

#### 3.2 Technology Adoption Theories:

- **Technology Acceptance Model (TAM):** According to the TAM, which (Davis, 1989) proposed, people accept and adopt new technologies based on their perceptions of their perceived utility and simplicity of use. TAM may be applied to VR to evaluate consumer interest in VR experiences as well as the factors that influence adoption.
- **Innovation Diffusion Theory:** The diffusion of inventions in society is examined via the innovation diffusion theory. In terms of consumer experiences, VR can be viewed as innovative. Insights on the adoption of VR technology and its influence on consumer behaviour can be gained by examining how customers use it and how early adopters affect others (Miller, 2015).

So, these are the following hypotheses:

**H1: There is a significant association between age and consumer buying behaviour.**

H2: There is a significant association between gender and consumer buying behaviour.

H3: There is a significant association between occupation and consumer buying behaviour.

H4: There is a significant association between location and consumer buying behaviour.

H5: There is a significant association between shopping experience and consumer buying behaviour.

H6: There is a significant association between product understanding and consumer buying behaviour.

H7: There is a significant association between likely purchase and consumer buying behaviour.

H8: There is a significant association between product exploration and consumer buying behaviour.

H9: There is a significant association between revolutionized shopping and consumer buying behaviour.

H10: There is a significant association between shopping recommendations and consumer buying behaviour.

H11: There is a significant association between the influence of new products and consumer buying behaviour.

H12: There is a significant association between brand loyalty and consumer buying behaviour.

H13: There is a significant association between trust in VR and consumer buying behaviour.

H14: There is a significant association between engagement in VR and consumer buying behaviour.

#### IV. METHODOLOGY:

##### 4.1 Sample and Data Collection

The primary source of data for this study was collected through the use of a questionnaire. A total of 130 respondents participated in the study by completing the questionnaire. The questionnaire was distributed to a diverse group of individuals, encompassing various age groups and employment statuses. These participants included students, working professionals, unemployed individuals, and retired individuals.

##### 4.2 Measurement of variables

All the questions were developed for this study on the scale used by (Likert, 1932). The scale typically consists of a few items, to which respondents are asked to express their level of agreement or disagreement on a 5-point scale, from "strongly agree" to "strongly disagree," with 1 being "strongly disagree" and 5 being "strongly agree". The table below displays the sample's demographic information.

Characteristics	N	%
<i>Age (Years)</i>		
below 18	5	3.84

18 - 24	59	45.3
25 - 34	49	37.7
35 - 44	12	9.23
above 45	5	3.84
<b><i>Gender</i></b>		
Male	48	36.92
Female	64	49.23
Prefer not to say	18	13.85
<b><i>Location</i></b>		
Urban	76	58.46
Rural	29	22.31
Suburban	25	19.23
<b><i>Occupation</i></b>		
Student	67	51.54
Employed	43	33.07
Unemployed	13	10
Retired	7	5.38

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Table 1: Characteristics of respondents

In this demographic analysis, we present a comprehensive overview of the characteristics of a surveyed population. The study includes individuals across various age groups, with the largest cohort falling within the 18-24 age range (45.3%), followed closely by those in the 25-34 age group (37.7%). Those aged 35-44 and those above 45 constitute smaller segments, each comprising 9.23% and 3.84% of the total population, respectively. Regarding gender distribution, the majority identified as female 49.23%, while 36.92% identified as male, and 13.85% preferred not to disclose their gender. Geographically, a significant proportion of respondents resided in urban areas (58.46%), while 22.31% were from rural areas, and 19.23% hailed from suburban regions. Occupation-wise, students represented the largest group (51.54%), followed by the employed (33.07%), the unemployed (10%), and retired individuals (5.38%). These demographic insights provide a foundational understanding of the surveyed population, which is invaluable for shaping research strategies and tailoring interventions that cater to the specific needs and characteristics of these diverse groups.

## V. ANALYSIS AND OUTCOMES

### 5.1 Summary Statistics

	Shopping Experience	...	Recommendation
count	130.000000	...	130.000000
mean	3.992308	...	3.961538
std	0.935900	...	0.975704
min	1.000000	...	1.000000
25%	3.000000	...	3.000000
50%	4.000000	...	4.000000
75%	5.000000	...	5.000000
max	5.000000	...	5.000000

Figure 1: Summary statistics

In this dataset, we have information from 130 respondents, each characterized by various attributes. The dataset includes data related to individuals' age, gender, location, occupation, and their shopping experiences, which range from a minimum rating of 1 to a maximum of 5. On average, respondents reported a slightly positive shopping experience, with a mean score of 3.992. The dataset also captures factors influencing consumers' decision-making processes. Interestingly, the data suggests that also frequently make recommendations, as indicated by an average score of 3.962.

The dataset additionally provides insights into consumer buying behaviour and their likelihood to embrace shopping revolutions. In summary, these findings lay the foundation for comprehensive research on consumer behaviour and preferences, which can be invaluable for businesses and marketers in tailoring their strategies to meet consumer expectations and drive brand success in today's dynamic market environment.

## 5.2 Hypothesis Testing

Hypothesis testing is a fundamental statistical method used in research to evaluate the validity of a claim or hypothesis about a population. It involves a systematic process to determine if there's enough evidence in sample data to support or reject a specific hypothesis.

**Independent Variables:** Age, Gender, Location, Occupation, Shopping.Experience, Product\_Understanding, Positive.Influence, Likely\_Purchase, Exploring\_products, Influence\_new\_products, Brand.Loyalty, Trust, Shopping\_Revolutionize, Recommendation.

### **Dependent Variable: Consumer\_Buying\_Behavior**

It is essential to consider the nature of both the independent and dependent variables. The independent variable is categorical and consists of five distinct levels, ranging from "strongly agree" to "strongly disagree," where "strongly disagree" is assigned a value of 1 and "strongly

agree" is assigned a value of 5. Meanwhile, the dependent variable is also categorical, but it has two levels, namely "Yes" and "No."

Given the categorical nature of both variables and the fact that we are examining the association or relationship between them, the most appropriate statistical test to employ in this context is the Chi-Square Test.

By utilizing the Chi-Square Test, we can rigorously examine whether there is a statistically significant relationship between the levels of the independent variable (ranging from "strongly agree" to "strongly disagree") and the occurrence of the dependent variable ("Yes" or "No"). This will allow us to draw meaningful conclusions about the potential influence of the independent variable on the likelihood of the dependent variable taking on the values of "Yes" or "No" within our dataset.

### Hypotheses Tests for Demographics:

```
Chi-square test between Age and Consumer_Buying_Behavior
Chi-square statistic: 1.3722864885456523
P-value: 0.8489971689162081
```

```
Chi-square test between Gender and Consumer_Buying_Behavior
Chi-square statistic: 1.4917293105783562
P-value: 0.4743239958278883
```

```
Chi-square test between Location and Consumer_Buying_Behavior
Chi-square statistic: 1.384690094696872
P-value: 0.5004012275031944
```

```
Chi-square test between Occupation and Consumer_Buying_Behavior
Chi-square statistic: 0.961470099315172
P-value: 0.810573888884948
```

Figure 2: Chi-Square test between all Demographics and Consumer\_Buying\_Behaviour

The results of the Pearson's Chi-squared tests examine the relationships between consumer buying behaviour and various demographic factors such as age, gender, location, and occupation. In each test, the chi-squared statistic ( $X^2$ ) measures the degree of association between these variables, while the p-value assesses the statistical significance of the association.

For the analysis of age and consumer buying behaviour, the p-value of 0.849 suggests that there is no significant association between age and consumer buying behaviour. Similarly, when considering gender and location, the p-values of 0.4743 and 0.5004, respectively, indicate no

significant relationships between these factors and consumer buying behaviour. Furthermore, the test involving occupation and consumer buying behaviour yields a p-value of 0.8106, also signifying no statistically significant connection.

In summary, these results imply that there are no strong or meaningful associations between consumer buying behaviour and the demographic variables of age, gender, location, or occupation in the dataset. This suggests that consumer buying behaviour may be influenced by other factors not captured in this dataset or that the relationships are more complex and nuanced than can be revealed by these individual demographic variables. Further analysis or consideration of additional factors may be necessary to fully understand the drivers of consumer buying behaviour.

### Hypotheses Tests for Independent Variables:

```

Chi-square test between Shopping Experience and Consumer_Buying_Behavior
Chi-square statistic: 15.359506901443464
P-value: 0.004010816963982759
Chi-square test between Product_Understanding and Consumer_Buying_Behavior
Chi-square statistic: 16.49661176070632
P-value: 0.002420295851324363
Chi-square test between Positive Influence and Consumer_Buying_Behavior
Chi-square statistic: 71.62941893539212
P-value: 1.027757570980555e-14
Chi-square test between Likely_purchase and Consumer_Buying_Behavior
Chi-square statistic: 34.34063249059793
P-value: 6.344375629133493e-07
Chi-square test between Exploring_products and Consumer_Buying_Behavior
Chi-square statistic: 40.4730942566268
P-value: 3.4551201566162696e-08
Chi-square test between Influence_new_products and Consumer_Buying_Behavior
Chi-square statistic: 20.392655627155936
P-value: 0.0004177021401474805
Chi-square test between Brand Loyalty and Consumer_Buying_Behavior
Chi-square statistic: 16.458286339756416
P-value: 0.0024620105732005033
Chi-square test between Trust and Consumer_Buying_Behavior
Chi-square statistic: 41.8919912540392
P-value: 1.7564062326579298e-08
Chi-square test between Shopping_Revolutionize and Consumer_Buying_Behavior
Chi-square statistic: 9.957117949468515
P-value: 0.041156252885186165
Chi-square test between Recommendation and Consumer_Buying_Behavior
Chi-square statistic: 14.912320956845358
P-value: 0.00488656707355779

```

Figure: 3 Chi-Square test between all Independent Variables and Consumer\_Buying\_Behaviour

The results of the Pearson's Chi-squared tests reveal significant associations between consumer buying behaviour and various factors related to shopping and product understanding. In each test, the chi-squared statistic ( $\chi^2$ ) measures the strength of the relationship, while the p-value assesses the statistical significance of this association.

First, examining the relationship between consumer buying behaviour and shopping experience, we find a relatively low p-value of 0.004011. This suggests that there is a statistically significant association between these two variables. Consumers' buying behaviour is linked to their overall shopping experience.

Similarly, the tests involving consumer buying behaviour and product understanding, likely purchase intentions, exploring products, influence on new products, brand loyalty, trust, and shopping revolutionization all yield low p-values, indicating significant associations. This implies that consumers' buying behaviour is influenced by their understanding of products, intentions to make purchases, their interest in exploring new products, loyalty to specific brands, trust in the shopping process, and their perception of shopping as a transformative experience.

Moreover, the association with recommendations is also statistically significant, implying that consumers' buying behaviour is influenced by their propensity to make product recommendations to others.

In summary, these results emphasize the interplay between consumer buying behavior and a range of shopping-related and product understanding factors. They suggest that businesses and marketers should pay close attention to these elements when developing strategies to influence and cater to consumer preferences effectively.

### 5.3 Model Building

#### A. Model Evaluation

**Partitioning of data:** Partitioning of data in Python, or any other data analysis tool, is a crucial step in the process of building and evaluating machine learning models. It involves splitting a dataset into two subsets: a training set and a testing set. The training set is used to train the model, allowing it to learn the underlying patterns in the data, while the testing set is used to evaluate the model's performance by assessing how well it generalizes to new, unseen data. This division helps assess the model's predictive capabilities and its potential for overfitting. In Python, you can achieve this, using functions like 'train\_test\_split' from the 'sklearn' package or by manually splitting the data using subsetting or other custom methods. In this project, we establish a partition by allocating 80% of the dataset to the training set, reserving the remaining 20% for the test set.

**Model Building:**

Model building is a crucial step in the realm of statistical modelling and data analysis. One essential aspect of model building is the selection of relevant predictor variables.

**Model:**

The model started with all the predictor variables Age, Gender, Location, Occupation, Shopping.Experience, Product\_Understanding, Positive Influence, Likely\_purchase,

Exploring\_products, Influence\_new\_products, Brand.Loyalty, Trust,

Shopping\_Revolutionize, Recommendation related to a dependent variable

Buying\_Behavior.

**Accuracy of the model using Confusion Matrix:**

A confusion matrix is a fundamental tool in assessing the accuracy of a model, especially in classification tasks. It provides a clear summary of a model's performance by comparing predicted class labels to the actual class labels in the dataset. The matrix contains four key values: True Positives (correctly predicted positive cases), True Negatives (correctly predicted negative cases), False Positives (incorrectly predicted as positive), and False Negatives (incorrectly predicted as negative). Accuracy, a commonly used metric, is determined by the ratio of correct predictions (True Positives and True Negatives) to the total number of predictions made. In a classification problem, a higher accuracy score indicates that the model is making more correct predictions, while a lower accuracy score suggests that it's making more errors in classifying the data.

```
Confusion Matrix:
[[ 1  1]
 [ 0 13]]
Accuracy: 0.9333333333333333
```

Figure 4: Accuracy of the model

**Confusion Matrix:**

- True Positives (TP): There are 13 instances where the model correctly predicted '1' when the actual value was '1'.
- True Negatives (TN): The model accurately predicted '0' for 1 instances where the true value was '0'.

- False Positives (FP): The model incorrectly predicted '1' for 1 instances where the true value was '0'.
- False Negatives (FN): The model made incorrect '0' predictions for 0 instances where the true value was '1'.

Accuracy: The model's overall accuracy is 93.33%. It measures how often the model's predictions are correct, indicating a reasonably accurate model.

In summary, the model is reasonably accurate in predicting impact of virtual reality on consumer buying behaviour.

## VI. DISCUSSIONS AND CONCLUSION

The Pearson's Chi-squared tests conducted to assess the relationship between consumer buying behaviour and demographic factors such as age, gender, location, and occupation yield results indicating weak or no statistically significant associations.

The high p-values for age, gender, location, and occupation tests (0.849, 0.4743, 0.5004, and 0.8106) suggest that there is no substantial statistical link between these demographic variables and consumer buying behaviour. In other words, consumers' purchasing decisions appear to be largely independent of their age, gender, location, or occupation as captured in this dataset. [Figure 2]

In conclusion, these findings imply that the factors influencing consumer buying behaviour are likely more nuanced and complex, extending beyond basic demographic characteristics. Marketers and businesses may need to consider other aspects of consumer behaviour and preferences when tailoring their strategies, as these demographic variables do not appear to be significant determinants of purchasing decisions in this specific dataset.

The Pearson's Chi-squared tests conducted on the relationship between consumer buying behaviour and various factors reveal several important insights. The consistently low p-values across the tests indicate strong statistical associations between consumer buying behaviour and the considered factors, demonstrating their significant impact on purchasing decisions.

First and foremost, shopping experience and product understanding exhibit strong correlations with consumer buying behaviour, signifying that a positive shopping experience and a comprehensive understanding of products are likely to influence consumers' purchasing decisions. This underlines the importance of creating a satisfying shopping environment and providing clear product information to enhance sales.

Likely purchase intentions, the exploration of new products, influence on new products, brand loyalty, trust, and recommendations also exhibit substantial connections with consumer buying behaviour. These results emphasize the role of trust, loyalty, and personal recommendations in

shaping consumers' choices, while also highlighting the impact of their intent to make purchases and their willingness to explore novel products.

Additionally, the shopping revolutionization factor, although less significant than others, still shows a notable association with consumer buying behaviour. This suggests that consumers who perceive shopping as transformative might exhibit different purchasing patterns.

In conclusion, the findings of these Chi-squared tests underscore the multifaceted nature of consumer buying behaviour, which is influenced by a variety of factors related to the shopping experience, product understanding, trust, loyalty, and more. These insights can be invaluable for businesses and marketers seeking to tailor their strategies to better align with consumer preferences and drive sales success in a competitive market. [Figure 3]

Our research highlights the nuanced relationships between "Consumer Buying Behaviour" and these essential variables. Understanding and harnessing these connections can empower businesses to make informed decisions, refine marketing strategies, and ultimately enhance their competitiveness in the marketplace. As such, these findings offer valuable insights and strategic directions for organizations seeking to optimize their consumer-focused approaches and, in turn, their overall performance and success.

From Figure 4, we can conclude, the model appears to perform well with an accuracy of 93.33%. These results suggest that the model has merit and potential for positive applications.

## VII. MANAGERIAL IMPLICATIONS

Exploring the intricate relationships among independent variables, namely Customer Experience, Customer Engagement, Trust, and Loyalty, in the context of Virtual Reality (VR), and their influence on the dependent variable, Consumer Buying Behaviour, holds substantial promise for providing managers with strategic insights. Drawing from the data meticulously collected and rigorously analysed in this study, we discern several consequential managerial implications. Firstly, these findings suggest the strategic integration of Virtual Reality into marketing campaigns, enabling managers to craft immersive VR content aligning with consumer preferences, thereby enhancing brand engagement and loyalty. Secondly, the insights offer guidance for tailoring customized VR experiences for distinct target segments, optimizing marketing endeavours. Thirdly, VR technology can be harnessed for enriched product visualization and demonstration, particularly beneficial in industries where immersive product experiences impact purchasing decisions. Furthermore, managers can explore the potential of VR as a potent sales tool, leveraging the insights to incorporate VR into sales presentations, product demonstrations, and consultations. As organizations contemplate investing in VR infrastructure and content creation, this research informs such decisions based on consumer behaviour insights. Establishing feedback mechanisms to refine VR content, benchmarking against industry competitors,

measuring ROI, and undertaking consumer education initiatives are additional strategic avenues that emerge from this study.

### VIII. LIMITATIONS AND RECOMMENDATION

Limitations of this study encompass the relatively modest sample size and limited diversity among participants, potentially constraining the generalizability of findings. The study's cross-sectional design provides a static snapshot, overlooking the evolving nature of consumer behaviour influenced by Virtual Reality. To enhance the robustness of research in this domain, future investigations should prioritize larger and more diverse samples while adopting longitudinal approaches to capture the dynamic shifts in consumer buying behaviour over time. Additionally, incorporating qualitative research methods alongside quantitative analyses can offer deeper insights into the underlying motivations and experiences driving the observed impacts of Virtual Reality on consumers' purchasing decisions. Such comprehensive efforts will contribute to a more nuanced understanding of the multifaceted relationship between Virtual Reality and consumer behaviour.

### REFERENCES

- Chirico, A. C. (2017). Effectiveness of immersive videos in inducing awe: An experimental study. *Scientific Reports*, 7(1), 1218.
- Choi, D. &. (2018). Virtual Reality and Consumer Purchase Behavior: A Cognitive Perspective.
- Choi, J. &. (2019). The impact of virtual reality on advertising effectiveness. *Journal of Consumer Affairs*, , 53(3), 1090-1113.
- Cialdini. (1984). *Cialdini's principles of influence*. ResearchGate.
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. ResearchGate.
- Elodie, E., Angélique, R., & Anne-Lise, L. (2023). Perception of avatars nonverbal behaviors in virtual reality. ResearchGate.
- Generoso, B., Vittoria, M., & Riccardo, R. (2023). How do consumers evaluate products in virtual reality? *Emerald*.
- Huang, L. &. ((2013)). The impact of virtual reality on consumer purchase decision: An empirical study. *Proceedings of the American Marketing Association Winter Educators' Conference*, 24(1), 151-152.
- Huang, L. &. ((2019)). *Virtual Reality and Consumer Behavior: An Empirical Study*.

- Huang, L. &. (2013). The impact of virtual reality on consumer purchase decision: An empirical study. . Proceedings of the American Marketing Association Winter Educators' Conference, 24(1), 151-152.
- J, S. (1992). Defining virtual reality: Dimensions determining telepresence. Journal of Communication, 42973-93.
- Jin, S. A. (2019). The Effects of Virtual Reality Advertising on Consumer Engagement and Purchase Intention.
- Josephine, A., Gregory, S., & Maurice, M. (2018). Effects of Organization Culture on Customer Retention in Commercial Banks in Kenya. IJARKE Business & Management Journal.
- Kaur, G., & Verma, J. (2023). Impact of Augmented Reality and Virtual Reality on Customer Purchase Behavior in the Virtual World. ResearchGate.
- Kim, H. &. (2018). Immersion in Virtual Reality Predicts Consumer Behavior and Technology Acceptance.
- Likert, R. (1932).
- Lin, R. &. (2020). The Influence of Virtual Reality on Impulse Buying Behavior.
- Ma, M. &. (2007). Through a glass darkly: Information technology design, identity verification, and knowledge contribution in online communities.
- Miller, R. (2015). Rogers' Innovation Diffusion Theory (1962, 1995). ResearchGate.
- Pankaj, M. M. (2020). Effective Rewards and Recognition Strategy: Enhancing Employee Engagement, Customer Retention and Company Performance. ResearchGate.
- Schmitt, B., & Zarantonello, L. (2013). Consumer Experience and Experiential Marketing: A Critical Review. Emerald.
- Shin, D. H. (2020). The Influence of Virtual Reality on Consumer Purchase Behavior in an Online Shopping Context.
- Slater, M. &. (1997). A Framework for Immersive Virtual Environments (FIVE): Speculations on the Role of Presence in Virtual Environments.
- Steuer, J. (1992). Defining Virtual Reality: Dimensions Determining Telepresence.
- Taylan, B., & Mersid, P. (2021). Employee performance and customer loyalty: mediation effect of customer satisfaction. ResearchGate.
- Wang, D. &. (2019). The Impact of Virtual Reality on Consumer Satisfaction and Loyalty.

Wu, C.-W. (2023). The Impact of Virtual Reality and Augmented Reality Service Technologies on Consumer Purchase Intention for Fashion Brands. ResearchGate.