BARRIERS TO THE ADOPTION OF VIRTUAL REALITY IN E-COMMERCE IN SOUTH AFRICA

by

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DECLARATION

I, Phendulwa Jaxa, declare that the contents of this dissertation/thesis represent my own unaided work, and that the dissertation/thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

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ABSTRACT

The introduction emphasise s the accelerated growth of e-commerce in South Africa due to the COVID-19 pandemic, creating a unique opportunity for the adoption of virtual reality (VR) technology to enhance online shopping experiences. Despite VR's potential to transform e-commerce, there is a critical need to understand the barriers influencing its adoption among South African e-commerce consumers. This need arises from the limited adoption of VR in South Africa's e-commerce landscape despite its global popularity, primarily due to factors like high device costs, limited access to VR platforms, and low consumer awareness. The study focuses on examining these barriers from the perspective of e-commerce consumers to understand their attitudes and perceptions towards VR, which is essential for guiding e-commerce companies in developing strategies to enhance VR adoption. The study used a qualitative approach, employing a case study design and semi-structured interviews, and focused on individuals aged 18 and above residing in Cape Town, South Africa. The study's findings suggest that affordability and accessibility of VR headsets are key barriers that need to be addressed, and it recommends exploring partnerships between e-commerce companies and VR manufacturers to introduce cost-effective alternatives and promotional deals that can encourage broader consumer adoption of VR technology. The study utilized thematic analysis as the primary method to analyse the gathered data. The study found out that the participants demonstrated a collective and resolute conviction that virtual reality (VR) will unquestionably influence the future terrain of internet business. Their unwaveringly positive perspective on the revolutionary capacity of VR in the domain of online buying closely aligns with their expectation of a significant and lasting influence on the course of e-commerce. Their observations highlighted the significance of carefully assessing the use of virtual reality (VR) in certain product scenarios to guarantee maximum efficacy in improving the entire online shopping experience. The study recommended that there is need to investigate efforts to enhance the affordability and accessibility of virtual reality headsets for a wider range of consumers. Engage in partnerships with virtual reality manufacturers and technology suppliers to explore the possibility of introducing cost-effective alternatives or promotional deals.

Keywords

Electronic commerce, Traditional online shopping, Virtual reality.

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CHAPTER 1 OVERVIEW OF THE STUDY

1.1 Introduction

The use of virtual reality (VR) technology is expanding rapidly and has already found widespread use in a variety of industries, including gaming, education, and healthcare (Abbott, 2022). Globally, the adoption of VR is transforming these industries by providing new ways to engage, educate, and treat users. In recent years, the notion of virtual reality has also acquired a large amount of attention in the online shopping business (Mankhili, 2023). This is because it provides customers with a more immersive shopping experience, bridging the gap between physical and digital retail spaces (deBeer & Lidie, 2024). Given the growing number of people shopping online, it is essential to understand the possible influence that virtual reality might have on consumer behaviour in South Africa.

An ever-increasing number of customers in South Africa choose to do their shopping online because it is more convenient and saves them more time than traditional methods (Abbott, 2022). According to Oladunjoye and Tshidzumba (2023), the income in Sub-Saharan Africa that is predicted to be generated through e-commerce is expected to increase to $4.8 billion by 2025, up from $2.7 billion in 2020. However, despite this growth projection, the expansion of e-commerce in South Africa is currently being hindered by several problems, such as restricted access to the internet, a lack of confidence in online payment methods, and limited information about the advantages of purchasing online. Due to these issues, it is essential to investigate novel approaches to improving the quality of the online shopping experience available to customers in South Africa. One such approach is through the integration of virtual reality technology in the online shopping environment. VR creates a simulated environment that may either be close to or quite dissimilar to the actual world, depending on the specifics of its application (Papagiannidis Pantano, See-To, Dennis, & Bourlakis, 2017; Abbott, 2022). In the context of online shopping, VR has been adapted to provide customers with a more immersive and participatory experience. This enables customers to view and feel items in a more realistic manner, which may raise their level of happiness and trust in the products they buy (Papagiannidis et al., 2017).

Several studies have pointed to the potential advantages that virtual reality might bring to the world of online purchasing. For instance, Lee (2009) discovered that the usage of virtual reality in online shopping may boost customers' purchase intention, perceived utility, and overall satisfaction with the experience. Similarly, Kim (2022) discovered that the use of virtual reality in online purchasing can enhance customer satisfaction, confidence in products, and loyalty to the brand. However, there is a notion that consumers in South Africa are unaware of VR's capabilities in the shopping space. As such, the lack of awareness prevents them from accepting or adopting VR technology, which is disappointing given the potential advantages that virtual reality may bring to online purchasing. According to the findings of a study carried out by Peukert et al. (2019), only a tiny proportion of customers in South Africa were familiar with virtual reality technology and the ways in which it may be used for online purchasing. Most customers in South Africa preferred more conventional forms of online purchasing and showed reluctance to embrace innovative technologies such as virtual reality. Yet, the use of virtual reality by customers in South Africa has the potential to significantly improve the quality of their online purchasing experiences (Dieck & Han, 2021).

Therefore, it is essential to broaden South African customers' understanding of virtual reality in online buying through increased education and awareness of the topic (Oladunjoye & Tshidzumba, 2023). By doing so, the acceptance and usage of virtual reality in online shopping will likely increase, which may lead to enhanced customer satisfaction, greater customer loyalty, and increased revenue for online merchants in South Africa.

1.2 Research Problem

E-commerce is expanding in South Africa, a developing nation. Statista (2023) predicts that the South African e-commerce sector will grow from R52.38 billion in 2017 to R138bn in 2023. The COVID-19 epidemic has hastened the development of e-commerce in South Africa as more people choose to purchase online rather than in person (Abbott, 2022). Retailers have a chance to use VR technology to improve the online buying experience, Glazer, Hobson et al. (2010), thanks to South Africa's booming e-commerce market. Despite the growing potential of Virtual Reality in transforming the E-commerce industry, there needs to be more understanding of the barriers influencing VR adoption among E-commerce consumers in South Africa (Griffin et al.,2022). Only 1% of South African merchants, according to a 2019 study by Peukert et al. (2019), employed VR technology to improve the online shopping experience. The lack of adoption of VR

technology among South African online businesses emphasise s the need to study the barriers influencing VR adoption among e-commerce consumers in South Africa and how they affect consumers' online buying habits.

There has not been much study on how factors influencing VR adoption affect online buying behaviour in South Africa for a variety of reasons. First, because virtual reality technology is still very new to the e-commerce sector, South African online businesses are mostly unaware of its potential advantages, as shown in other research (Griffin et al., 2017; Ndayizigamiye et al., 2019). Second, South African internet shoppers may not be familiar with VR technology, and if they are aware of it, it might prevent online shoppers from using it. The Technology Acceptance Model (TAM) will assist in examining users' acceptance and use of technology. The Technology Acceptance Model (TAM) provides a valuable framework for examining users' acceptance and use of technology (Ajibade, 2018).

This study aims to investigate the factors that influence the adoption of virtual reality in E-commerce within the South African context. By identifying the key determinants within the TAM model, such as perceived usefulness, perceived ease of use, and other relevant factors specific to the South African E-commerce landscape, this research intends to contribute to a deeper understanding of the technology adoption process in the context of virtual reality.

1.3 Problem Statement

Despite the growing global adoption of virtual reality (VR) technology in various sectors, its use within South Africa's e-commerce sector remains limited and understudied (deBeer & Lidie, 2024). The primary barrier appears to be a lack of comprehensive understanding of the factors that influence South African consumers' willingness to adopt VR for online shopping (Mankhili, 2023). While there have been studies highlighting general barriers to e-commerce adoption in the region, such as limited internet access and payment security concerns, there is a lack of research specifically focused on the challenges from the consumer perspective regarding VR adoption—such as perceived complexity, cost implications, and lack of consumer awareness (Oladunjoye & Tshidzumba, 2023). Addressing these consumer-focused gaps is crucial because, without a clear understanding of the barriers that deter consumers from adopting VR technology, e-commerce businesses cannot develop effective strategies to encourage its integration into the online shopping experience. This study, therefore, aims to fill this knowledge gap by exploring consumer

attitudes, levels of awareness, and perceived challenges regarding the use of VR in e-commerce. The findings will contribute to a deeper understanding of the factors influencing consumer adoption of VR, which can guide businesses in developing tailored strategies to promote VR use, ultimately enhancing the online shopping experience for South African consumers and positioning the country's e-commerce sector as a competitive player in the global digital marketplace.

1.4 Research Aim

This study aims to explore the barriers to the adoption of virtual reality in e-commerce in South Africa.

1.5 Research Objectives

The objective of this study is to:

- **O1:** To determine whether consumers perceive virtual reality as easy to use in e-commerce in South Africa.
- **O2:** To understand how consumers perceive the usefulness of, attitude to, and actual use of virtual reality in e-commerce in South Africa.

1.6 Research Questions

1.6.1 Main research question

MRQ: What are the barriers to the adoption of virtual reality in e-commerce in South Africa?

1.6.2 Sub-Questions

The study posed the following two sub-questions, namely SQ1 and SQ2:

- **SQ1**: How do South African consumers perceive the ease of use of virtual reality in e-commerce?
- SQ2: How do South African consumers perceive the usefulness of, attitude to and actual use of virtual reality in e-commerce?

The sub-questions link respectively to the two objectives, O1 and O2, listed in Section 1.5. Answering SQ1 and SQ2 facilitated answering the MRQ given in Section 1.6.1.

1.7 Significance

Virtual Reality is an emerging technology with the potential to revolutionise the way consumers shop online. Understanding how factors such as perceived ease of use, perceived usefulness, attitudes towards VR, and actual usage can help identify and address the barriers to VR adoption among consumers is crucial for businesses operating in the South African market. These factors, which are central components of the Technology Acceptance Model (TAM), provide a structured framework for examining consumer adoption behaviours. By analysing how consumers perceive the ease of use and usefulness of VR technology in the e-commerce context, as well as their attitudes toward it, businesses can gain valuable insights into the underlying reasons for acceptance or resistance to VR technology.

Perceived ease of use and usefulness directly influence consumer attitudes towards technology, which in turn affects their intention to use and actual usage behaviour. If consumers perceive VR technology as complex or not adding significant value to their online shopping experience, they may be less likely to adopt it. Thus, these constructs can help uncover specific barriers, such as the perceived difficulty in navigating VR environments or scepticism regarding the benefits of using VR for online shopping. Moreover, understanding consumers' attitudes towards VR can provide insight into psychological barriers, such as discomfort or uncertainty associated with immersive technologies. These attitudes, combined with perceptions of usefulness, can shed light on why some consumers might be reluctant to integrate VR into their shopping routines despite being aware of the technology. Analysing actual use can also reveal any usability challenges that arise during real-world interactions with VR platforms, providing a holistic understanding of both pre-adoption and post-adoption barriers.

1.8 Conclusion

This chapter has established the need for a comprehensive investigation into the barriers hindering the adoption of virtual reality in South African e-commerce. Despite its potential to revolutionise online shopping experiences, VR's uptake remains limited due to factors such as consumer awareness, perceived ease of use, and technological limitations. By understanding

these barriers, this study aims to provide valuable insights for businesses, policymakers, and technology developers in South Africa, facilitating the wider adoption of VR and enhancing the overall e-commerce landscape.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

Virtual reality (VR) has gained significant attention as a technological innovation with the potential to revolutionise various industries, including e-commerce. However, understanding consumer perception regarding the ease of use of VR in e-commerce is crucial for its successful adoption (Mon, 2020). This section explores the scholastic evidence presented by previous scholars to determine whether consumers perceive VR as easy to use in the context of e-commerce in South Africa. By examining the factors influencing technology adoption, insights can be gained into the acceptance and potential challenges of VR in the South African e-commerce context.

The e-commerce industry has emerged as a prominent catalyst for economic growth and technological advancement due to the extensive integration of the Internet and mobile technology. E-commerce encompasses a range of models, such as business-to-consumer (B2C), business-to-business (B2B), and consumer-to-consumer (C2C) transactions (Moriset, 2018). The sector has experienced significant growth in South Africa, driven by increased internet penetration and the widespread adoption of mobile devices. According to Statistics South Africa, internet connectivity among South African households rose from 54.0% in 2014 to 61.8% in 2019. This rise in internet accessibility has fueled the expansion of e-commerce, with consumers increasingly using smartphones and tablets for online shopping (Donga & Kadyamatimba, 2020).

The significant growth in e-commerce is further evidenced by a 66% increase in South Africa's electronic commerce sector during 2020, resulting in a total online sales value of ZAR 30.2 billion (Martínez-Navarro, 2019). The notable expansion reflects shifting consumer preferences towards online shopping platforms, and this trend is expected to continue due to ongoing improvements in digital infrastructure and the introduction of innovative solutions by e-commerce enterprises (Mon, 2020). With mobile devices progressively becoming the predominant medium for conducting e-commerce transactions in South Africa, businesses must modify their strategies to enhance mobile experiences and effectively leverage the growing population of mobile users (Slazus & Bick, 2022).

Despite these advancements, South Africa continues to grapple with substantial disparities in digital connectivity, particularly in rural regions. In 2019, internet penetration in rural areas was

reported to be only 22.3%, highlighting the digital divide that restricts e-commerce opportunities for a significant portion of the population (Martínez-Navarro, 2019). This gap underscores the need for focused initiatives to promote inclusivity in the adoption of e-commerce and bridge the existing divide. Moreover, concerns related to security, fraud, and data privacy remain a significant barrier to consumer trust in online transactions. The complexity of South Africa's payment ecosystem, which includes a mix of formal and informal payment modalities, further complicates the adoption of e-commerce activities (Mon, 2020). Addressing these challenges, along with logistical issues related to the final leg of delivery, is essential for ensuring a seamless end-to-end purchasing experience for consumers.

While the e-commerce industry in South Africa has shown impressive growth driven by increased internet penetration and the adoption of mobile technology, several barriers persist that hinder the broader adoption of e-commerce and emerging technologies like VR. Strategic initiatives aimed at bridging the digital divide, enhancing security measures, and fostering innovation in logistical solutions are essential to overcoming these challenges and ensuring the continued expansion of the e-commerce landscape.

2.2 Overview of e-commerce in South Africa

Multiple studies have demonstrated that the utilisation of e-commerce has played a significant role in fostering economic expansion in South Africa. This is primarily attributed to its facilitation of an expansive market reach for small and medium-sized enterprises (SMEs). The emergence of e-commerce has played a significant role in facilitating job creation and fostering the growth of established enterprises (Martínez-Navarro,2019; Karine, 2021). Nevertheless, certain academics contended that the expansion of electronic commerce could potentially result in the displacement of employment opportunities within conventional retail industries. According to the findings of Lixandroiu (2015), the emergence of e-commerce not only creates novel employment prospects but also poses a significant threat to the conventional retail industry, potentially resulting in a net decrease in employment opportunities. The advent of e-commerce has presented South African businesses with novel prospects to penetrate international markets. Mohammed (2021) conducted a study which found that e-commerce platforms have played a significant role in enabling the international expansion of domestic enterprises. These platforms have effectively mitigated the constraints imposed by geographical boundaries, thereby enabling businesses to extend their reach to customers located outside their national borders.

Conversely, certain scholars contend that the advantages of e-commerce have not been uniformly distributed among all enterprises in South Africa. The research conducted by Maican (2015) indicates that in e-commerce, significant corporations have experienced success, whereas small businesses encounter difficulties in competing due to constraints in resources and technology accessibility. The advent of e-commerce has resulted in notable enhancements in the efficiency and convenience of commercial transactions.

The study conducted by Goga & Paelo (2019) emphasises the role of e-commerce in diminishing transaction costs and optimising supply chains, resulting in enhanced productivity and expedited delivery durations. Nevertheless, critics contended that the digital divide in South Africa continues to pose a substantial obstacle, as a considerable segment of the populace lacks access to the internet and contemporary technologies. Nkwo (2019) highlight in their study that the presence of a digital divide poses a hindrance to the fair allocation of e-commerce advantages throughout the nation. There is ample evidence to support the claim that e-commerce platforms have played a significant role in enabling personalised marketing strategies and enhancing customer experiences. The study conducted by Sobré-Denton (2016) provides evidence supporting the notion that the utilisation of data analytics and customer profiling in the context of e-commerce can result in the development of customised offerings, heightened levels of customer satisfaction, and increased customer loyalty. However, the emergence of privacy and security concerns has been identified as a notable drawback of e-commerce in the context of South Africa. According to an investigation conducted by Maican (2015), there exists a notable degree of consumer unease regarding the disclosure of personal information on the Internet, resulting in hesitancy to participate fully in e-commerce platforms.

2.2 Introduction to VR technology and its potential in e-commerce

The origins of virtual reality may be traced back to the 19th century, coinciding with the development of the stereoscope, a device that facilitated the creation of three-dimensional visual representations. Nonetheless, it was not until the middle of the 20th century that the phrase "virtual reality" was officially introduced by Jaron Lanier, a computer scientist (Maican, 2015). The notion of virtual reality has been a prominent element in science fiction literature for a considerable period, captivating individuals' imaginations via illustrations of all-encompassing digital areas (Komito, 2019). In recent years, the previously conceptualised notion has swiftly materialised,

signifying the beginning of the virtual reality revolution. The concept of virtual reality is not novel, yet its progression has been characterised by notable technological improvements (Mon, 2020).

During the 1990s, the first efforts in consumer VR were exemplified by products such as the Virtual Boy developed by Nintendo. However, these endeavours were very brief in duration and lacked a high level of immersion. The pivotal moment occurred during the 2010s when inexpensive and high-quality VR headsets, such as the Oculus Rift and HTC Vive, emerged (Martínez-Navarro, 2019). The integration of improved graphics and motion-tracking technology propelled these headsets.

Currently, virtual reality (VR) technology has achieved substantial advancements, resulting in its transition from a specialised pursuit to an industry that is seeing fast expansion (Eapen, 2020). VR headsets have seen increased accessibility and affordability, resulting in their adoption by not just gamers but also professionals across diverse sectors, including healthcare, education, and entertainment. The capacity to provide really immersive experiences stands as a notable accomplishment within the area of VR technology. The use of high-resolution screens, accurate motion tracking, and immersive soundscapes effectively immerse users in virtual environments, stimulating numerous sensory experiences (Martínez-Navarro, 2019). Moreover, the area of VR has seen a significant expansion in its content offerings, including interactive narratives, simulated environments, and communal interactions. This growth has contributed to the flourishing ecosystem of developers and content providers within the VR industry.

The global retail industry has undergone a significant transformation due to the exponential growth of e-commerce, and this trend has also had a profound impact on South Africa. The rapid progress of technology has facilitated the emergence of VR in the field of South African e-commerce. Advocates of VR within the area of e-commerce in South Africa contend that virtual shopping encounters offer an unparalleled level of customer engagement. Research conducted by Rolls (2016) revealed that individuals who utilised VR interfaces exhibited elevated levels of satisfaction and a more profound emotional attachment to products, consequently resulting in heightened purchase intent. VR technology enables customers to visually perceive products within realistic environments, thereby facilitating more informed decision-making processes. According to the findings of Lima (2019), the integration of VR technology has been found to have a positive effect on reducing return rates in e-commerce businesses. This positive impact can be attributed to the enhanced ability of customers to perceive product features using VR accurately.

The adoption of virtual reality has the potential to provide South African e-commerce businesses with a competitive advantage. According to Lima (2019), the prompt adoption of VR technologies has the potential to appeal to a larger demographic of technologically inclined consumers, thereby allowing businesses to position themselves as leaders within the industry. One of the foremost obstacles encountered in the integration of VR within the area of South African e-commerce pertains to the constrained accessibility of this technology. Sobré-Denton (2016) emphasised the relatively prohibitive cost and limited availability of VR devices, which could impede their widespread adoption among the general populace. In their study, Nkwo (2019) examined the technical obstacles encountered in South Africa, including issues related to internet connectivity and hardware limitations. These challenges have the potential to adversely affect the quality of VR experiences, consequently resulting in user discontent. Numerous studies have presented evidence regarding the potential advantages of VR in the field of electronic commerce (e-commerce). However, it is important to note that there is a lack of empirical data specifically about the South African context. Further investigation is required to gain a comprehensive understanding of the efficacy of VR within the domestic market (Tsagkias, 2021).

2.2.1 Virtual Reality Benefits

The rapid expansion of Virtual Reality (VR) technology has triggered a major paradigm shift, unlocking transformational possibilities across sectors such as education, healthcare, entertainment, and training. Among these, VR is poised to significantly impact the e-commerce landscape by offering unique benefits that can redefine online shopping experiences. One of the most notable advantages of VR in e-commerce is its ability to provide consumers with an immersive, interactive shopping experience. Unlike traditional online platforms that rely solely on static images and descriptions, VR allows customers to explore products in a 3D environment, offering a more tangible sense of presence. Through virtual showrooms and interactive product demonstrations, shoppers can inspect items from multiple angles, visualise products to scale, and even simulate real-world usage scenarios. This enhanced product visualisation reduces the uncertainty typically associated with online shopping, thereby increasing consumer confidence and trust in their purchase decisions. Grewe's (2023) study, although focused on the educational sector, demonstrates the effectiveness of VR in improving comprehension and engagement—principles that can be extended to e-commerce by enhancing how consumers interact with products. Similarly, the findings from Sobré-Denton (2016) emphasise VR’s potential in

specialised training sectors, where immersive simulations contribute to a deeper understanding of complex systems. In e-commerce, these attributes enable consumers to try on clothing items virtually, place furniture in simulated rooms, or experience automobile interiors, thereby bridging the gap between online and in-store experiences.

Despite these benefits, the adoption of VR in e-commerce still faces challenges, particularly in regions such as South Africa. Mon's (2020) research highlights financial constraints as a critical barrier to the widespread implementation of VR technology, which remains a significant concern in emerging markets. The high cost of VR headsets and the need for sophisticated technological infrastructure can limit accessibility for both consumers and businesses. Consequently, for VR to gain traction in South Africa's e-commerce sector, there is a need to explore cost-effective solutions, such as partnerships with technology providers or the development of VR-enabled features that do not require specialised equipment. Additionally, VR's ability to deliver context-specific learning and adapt to individual user preferences, as noted by Tsagkias (2021), can be leveraged to provide personalised shopping experiences in e-commerce. For instance, VR can allow consumers to customise products, simulate various configurations, or view items under different conditions, such as lighting or weather. This personalisation not only enhances user engagement but also aligns with global trends towards creating more tailored and interactive online shopping environments.

However, the effective implementation of VR in e-commerce also requires addressing the challenges of technology acceptance and usability. As Sobré-Denton (2016) observed in the medical field, individual differences in user experience, such as motion sickness or difficulty navigating virtual environments, can impact the effectiveness of VR technology. For e-commerce, this means ensuring that VR applications are user-friendly, intuitive, and compatible with a wide range of devices to minimise friction in user adoption. In the South African context, VR technology presents a unique opportunity to transform the digital marketplace by providing a more engaging and accessible online shopping experience. Mohammed's (2021) exploration of VR's ability to foster empathy and social connectedness can also be applied in e-commerce by creating virtual communities or interactive brand experiences that go beyond traditional shopping. For example, VR can be used to create virtual shopping events, guided store tours, or interactive product launch experiences, offering South African consumers a novel way to engage with brands and products.

To unlock these benefits, a strategic approach is needed that considers both the technological and socioeconomic barriers specific to the South African market. By addressing issues such as affordability and accessibility while simultaneously leveraging VR's potential for personalisation and interactivity, e-commerce businesses can harness this technology to enhance the online shopping experience and drive growth in the digital marketplace. VR offers a range of specific benefits for e-commerce, including immersive product visualisation, enhanced consumer confidence, personalised shopping experiences, and the potential for creating interactive brand engagement. While there are challenges to its adoption, particularly in the South African context, the strategic implementation of VR can significantly enhance the e-commerce sector, providing a competitive edge and a more compelling shopping experience for consumers.

2.3 Consumers' perceptions and attitudes toward VR in e-commerce

Gaining insights into how consumers in South Africa perceive the usefulness of virtual reality within the context of electronic commerce is of dominant importance for enterprises seeking to integrate VR technologies and proficiently augment online shopping encounters. Through a comprehensive analysis of scholarly evidence, it is possible to enhance the substantiation of this argument and gain a deeper understanding of the various factors that impact consumer perceptions of virtual reality within the area of electronic commerce. The study conducted by Perannagari and Chakrabarti (2020) centred on the acceptance of augmented reality within the retail sector. While the research conducted by the authors does not have a direct correlation with virtual reality or South Africa, it offers significant contributions in terms of understanding consumer perspectives on immersive technologies. Key factors influencing the acceptance of augmented reality (AR) were identified through the application of thematic analysis. This study underscores the importance of comprehending consumer perceptions and preferences in the implementation of immersive technologies, such as virtual reality, within the area of electronic commerce (e-commerce).

The research conducted by Fan et al. (2020) offers valuable insights into the usefulness of augmented reality (AR) within the context of online retail, as well as its influence on consumers' attitudes toward products. The study primarily centres on augmented reality (AR), but its conclusions can be extrapolated to gain insights into consumers' perceptions of the usefulness of virtual reality within the area of e-commerce. By utilising findings from studies on augmented reality (AR) adoption, organisations can acquire knowledge regarding the potential impact of

virtual reality on consumers' attitudes and how it may shape their perceptions of products within an online retail setting. There is substantial scholarly evidence that substantiates the proposition that virtual reality devices exert a significant influence on consumer behaviour within the domain of electronic commerce (e-commerce).

In a study conducted by Maican (2015), the researchers focused on investigating the impact of virtual reality technology on consumers' intention to make purchases within the context of online shopping. The researchers' findings indicated that individuals who were exposed to virtual reality product demonstrations demonstrated greater levels of intention to purchase in comparison to those who did not have access to this technology. The available empirical evidence provides compelling support for the notion that virtual reality technology holds significant promise in favourably shaping consumer perceptions and attitudes about electronic commerce (e-commerce). Upon careful examination of the available evidence, it becomes apparent that the incorporation of virtual reality technology into electronic commerce (e-commerce) platforms has the potential to generate advantageous results.

The immersive characteristics of virtual reality enable consumers to engage with products in a highly interactive and realistic manner, thus surpassing the constraints imposed by conventional 2D images or videos (Nielsen, 2016). Virtual reality technology enhances customers' comprehension and assessment of products by offering them the opportunity to explore the items virtually, closely examine their details and simulate real-life experiences (Lixandroiu, 2015). The enhanced level of comprehension and involvement with the product contributes to a greater inclination to make a purchase, as consumers perceive a greater sense of certainty and knowledge in their decision-making procedure.

Moreover, the utilisation of virtual reality technology fosters a heightened level of engagement and emotional attachment to the products, owing to its immersive and interactive characteristics (Hulten & Nakamura, 2022). Virtual reality technology can generate a feeling of being present in a virtual environment and tailor experiences to individual users. This characteristic of VR technology has been found to evoke heightened emotional reactions from consumers. Consequently, these emotional responses have the potential to augment overall consumer satisfaction and increase the probability of a purchase. In the area of e-commerce within South Africa, consumers may encounter constraints in their ability to physically engage with products before making a purchase (Martínez-Navarro, 2019). However, virtual reality technology has the

potential to address this issue by offering a heightened and authentic substitute experience. Through the utilisation of virtual reality technology, online retailers can establish virtual environments that facilitate consumers' engagement with the products (Eapen, 2020). This includes the ability for consumers to virtually try on products or visualise them within their desired settings. The degree of immersion and interactivity at this level serves to augment consumers' perception of utility and worth, thereby exerting a positive impact on their attitudes toward products (Tsagkias, 2021).

According to Wang et al. (2020), the utilisation of virtual reality technology in product presentations offers consumers a more comprehensive comprehension of product attributes and advantages due to the enhanced realism and intricate details. Although the studies referenced do not specifically examine South Africa, their findings provide valuable insights into consumer attitudes towards immersive technologies in the context of online retail. The observations can be extrapolated to South Africa, as it is probable that the fundamental cognitive processes and consumer behaviours exhibit similarities across diverse cultural settings. With the increasing global accessibility of VR technology, including in South Africa, it is anticipated that there will be a similar impact on consumer attitudes and behaviours. (Rolls, 2016).

The studies referenced in the literature were conducted before 2021, suggesting that the investigation into the use of virtual reality in electronic commerce (e-commerce) is still in a state of development and progression (Lima, 2019; Komito, 2019; Nkwo, 2019). With the ongoing advancements in technology and the increasing seamlessness and immersion of virtual reality experiences, it is plausible to anticipate a heightened influence on consumer attitudes in the forthcoming years.

The utilisation of immersive technologies, such as virtual reality devices, possesses significant potential for revolutionising diverse sectors, including the field of electronic commerce (Rolls, 2016). In the South African context, businesses must gain insight into consumer perceptions regarding the usefulness of virtual reality in e-commerce. This understanding is essential for making informed strategic choices and improving customer experiences. This study seeks to explore the determinants of consumer acceptance of virtual reality devices within the e-commerce industry in South Africa, utilising the theoretical framework established by Lee, Kim, and Choi (2019).

Businesses can optimise customer experiences, boost engagement, and ultimately drive sales by customising their strategies based on an understanding of the factors that impact consumer acceptance of virtual reality devices (Hulten & Nakamura, 2022). The utilisation of virtual reality can fundamentally transform the e-commerce sector by providing immersive and interactive encounters for consumers. For businesses to successfully integrate virtual reality technology and leverage its advantages, it is imperative to understand consumers' perceptions regarding its utility (Sobré-Denton, 2016). By investigating the various factors that influence the acceptance of virtual reality devices among consumers, enterprises operating in South Africa can acquire valuable insights about the specific dimensions that shape consumers' attitudes and behaviours towards this technology within the area of electronic commerce. This knowledge possesses the potential to enhance strategic decision-making processes and aid businesses in formulating impactful marketing strategies that align with the demands and preferences of consumers.

2.4 Factors influencing VR adoption in e-commerce (using TAM as a framework)

Understanding how individuals and organisations adopt new technology is heavily dependent on theoretical frameworks, which play a vital role in this process. A number of models have been constructed to explain the factors that influence the adoption of technology, each of which provides a different set of insights and viewpoints. The Diffusion of Innovations (DOI) model and the Unified Theory of Acceptance and Use of Technology (UTAUT) model are two of the most prominent models among these.

With time, the Diffusion of inventions (DOI) model investigates the manner in which inventions are transmitted and disseminated within social systems. According to Lima (2019), it emphasises five main characteristics that influence adoption: relative benefit, compatibility, complexity, trialability, and observability, which are all important. The model is especially helpful in gaining an understanding of the stages of innovation adoption, such as knowledge, persuasion, choice, implementation, and confirmation, as well as the roles that various adopters play, such as innovators, early adopters, early majority, late majority, and laggards. A wide range of applications of DOI have been carried out in a variety of settings in order to investigate the patterns of technological innovation diffusion (Wang, 2016).

TAM, DOI, and the Theory of Planned Behaviour are only a few of the eight diverse models that are incorporated into the Unified Theory of Acceptance and Use of Technology (UTAUT), which

is a synthesis of elements from these models. UTAUT highlights four fundamental factors that determine user intention and technology use (Mohammed, 2021). These constructs include performance expectancy, effort expectancy, social influence, and facilitating conditions. The concept is all-encompassing, providing a holistic perspective on the acceptance of technology by taking into account both individual and organisational aspects. UTAUT has garnered significant recognition as a result of its powerful predictive capability in comprehending the adoption of technology in a variety of contexts.

2.4.1 Technology Acceptance Model (TAM)

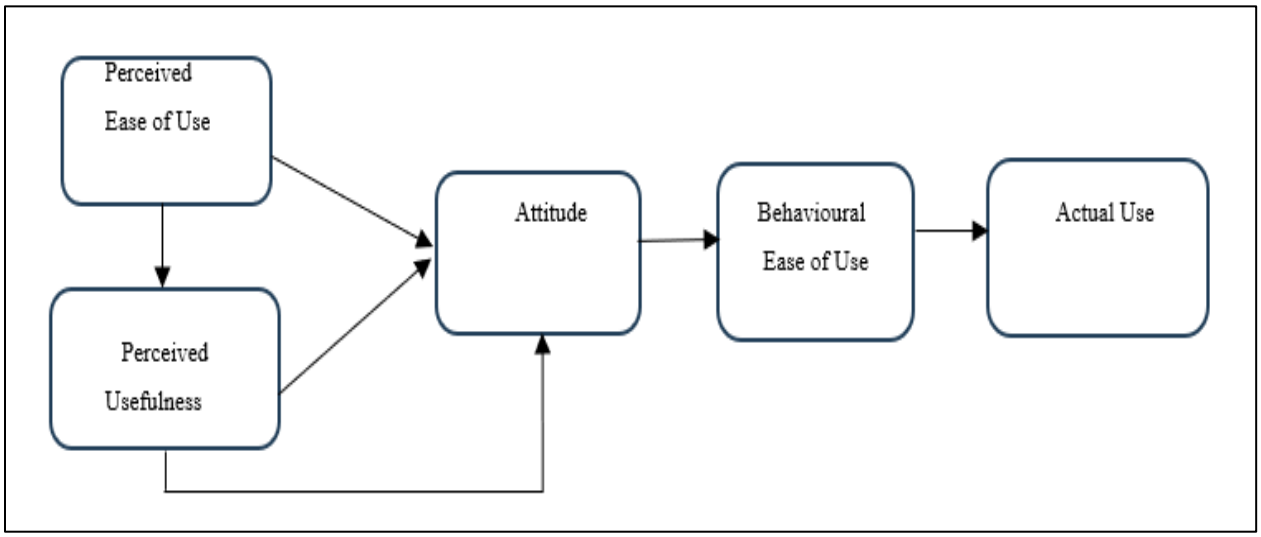

Figure 2.1 TAM Model (Davis, 1989)

The Technology Acceptance Model (TAM) is a well-established theoretical framework that investigates the various factors that impact the adoption of technology among users (Davis, 1989). The proposition posits that users' acceptance of technology is predominantly shaped by their perception of its usefulness and ease of use. The Technology Acceptance Model (TAM) is frequently employed to forecast future technology adoption, as opposed to evaluating user satisfaction or experience (Lewis, 2019).

The Technology Acceptance Model (TAM) is a widely acknowledged conceptual framework that elucidates the factors influencing individuals' acceptance of novel technologies. The proposition

suggests that the factors of perceived usefulness and perceived ease of use play a crucial role in the adoption of technology. Lee et al. (2019) broaden the comprehension of consumer acceptance of virtual reality devices by incorporating the Technology Acceptance Model (TAM) with additional factors such as enjoyment, social interaction, and strength of social ties. Enjoyment in the context of virtual reality pertains to the pleasurable experiences that users derive from engaging with VR technology. Meanwhile, social interaction and the strength of social ties encompass the degree to which VR facilitates the formation of social connections and enhances existing relationships.

In the context of the barriers to the adoption of virtual reality in e-commerce in South Africa, it is proposed that a theoretical framework based on the Technology Acceptance Model (TAM) can be utilised.

2.4.1.1 Perception of consumers regarding ease of use of virtual reality

The concept of perceived ease of use pertains to the degree to which prospective users hold the belief that a specific technology is straightforward to operate (Davis, 1989; Rahman et al., 2017). In the context of e-commerce, the construct of perceived ease of use pertains to the extent to which consumers can effortlessly navigate the virtual reality interface and successfully engage in activities such as product browsing, item selection, and purchase transactions. According to Abbott (2022), an elevated perception of ease of use would enhance the probability of adoption.

The study conducted by Lixandroiu (2015) centred on examining the reception and utilisation of virtual reality within the travel and tourism sector. While not directly related to electronic commerce, the outcomes of their research offer valuable insights into the wider perception of virtual reality technology. A critical aspect highlighted in their research pertains to the significant influence of ease of use on consumer acceptance of virtual reality technology. Consumers' inclination to adopt virtual reality technology is positively influenced by their perception of its ease of use. Buhalis and Li (2021) emphasise that the ease of use of virtual reality is influenced by various factors, including intuitive interaction, user-friendliness, and the minimal effort needed to navigate the VR experience. These various factors play a role in facilitating a smooth and user-friendly virtual reality experience, thereby augmenting consumer perception and fostering the adoption of this technology.

When considering the application of these observations to the specific context of e-commerce in South Africa, it becomes apparent that consumers' perception of virtual reality (VR) ease of use plays a pivotal role in determining its successful adoption within the e-commerce space. To foster consumer adoption of virtual reality (VR) technology within the area of e-commerce, it is imperative for businesses to emphasise the development of intuitive and user-friendly VR interfaces. According to Dieck and Han (2021), the optimisation of consumer navigation and interaction with virtual reality elements on e-commerce platforms can significantly improve the overall consumer experience and promote the widespread adoption of VR technology. In the context of South Africa, where the integration of virtual reality technology in the field of electronic commerce (e-commerce) is potentially in its nascent phase, prioritising the provision of a smooth and user-centric VR encounter assumes heightened significance. By effectively mitigating any potential obstacles associated with the intricacy or challenges of utilising virtual reality, electronic commerce (e-commerce) platforms can alleviate consumer apprehensions and enhance their inclination to interact with VR technology. It is noteworthy to mention that the study conducted by Buhalis and Li (2021) centred on the travel and tourism sector. Still, its findings hold broader significance for diverse industries, encompassing e-commerce. The significance of user-friendliness as a determinant impacting consumer adoption remains constant across various implementations of virtual reality technology.

The research conducted by Mohammed (2021) provides valuable insights into consumers' acceptance of virtual reality in the context of shopping, emphasising the importance of perceived ease of use. The researcher sought to gain insight into the determinants of consumers' adoption intention towards virtual reality for shopping by combining the Technology Acceptance Model (TAM) (Mofokeng, 2021). The study's findings underscore the notion that consumers are inclined to perceive virtual reality as user-friendly when it conforms to their preexisting experiences, presents a familiar interface, and demands minimal operational exertion. This implies that consumers' perception of VR technology is significantly influenced by factors such as familiarity and ease of use. When considering the application of these research findings within the e-commerce landscape of South Africa, it becomes apparent that businesses and e-commerce platforms should place importance on the development of virtual reality experiences that are congruent with consumers' pre-existing knowledge and offer user-friendly interfaces. Dieck and Han (2021) argue that through this approach, it is possible to improve consumers' perception of virtual reality as user-friendly, consequently raising the probability of its adoption.

For example, e-commerce platforms operating in South Africa may contemplate the integration of familiar components from conventional shopping encounters into their virtual reality interfaces. The potential features of online retail platforms encompass virtual storefronts that closely resemble physical stores, intuitive mechanisms for browsing and selecting products, and user-friendly navigation controls (Baxter & Hainey, 2019). The establishment of a cohesive and recognisable virtual reality shopping setting enables enterprises to diminish the perceived intricacy associated with utilising VR technology, thereby enhancing its accessibility and attractiveness to consumers. Additionally, the research conducted by Tao, Wang, and Liu (2020) emphasises the significance of reducing the cognitive load associated with the operation of virtual reality interfaces. This suggests that it is important for e-commerce platforms to prioritise the optimisation of the user experience, aiming to enhance the ease with which consumers can navigate virtual reality environments, engage with products, and successfully carry out transactions while minimising any avoidable complexities. By minimising the cognitive and physical exertion required to utilise virtual reality technology in the context of electronic commerce (e-commerce), enterprises have the potential to augment consumers' perception of its user-friendliness and thereby stimulate its widespread acceptance and utilisation.

2.4.1.2 Perceived Usefulness

The concept of perceived usefulness pertains to the extent to which individuals hold the belief that a particular technology will augment their level of performance or productivity (Hsiao & Yang, 2011; Rahman et al., 2017). In the area of e-commerce, within the framework of virtual reality, the concept of perceived usefulness pertains to the degree to which individuals perceive that virtual reality technology has the potential to enhance their shopping encounters. This may encompass functionalities such as the capacity to virtually simulate the experience of wearing garments or visually represent products in three-dimensional form (Marasco et al., 2018; Tussyadiah et al., 2018).

2.4.1.3 Attitude

Attitude pertains to an individual's comprehensive assessment of a particular technology (Davis, 1989; Rahman et al., 2017). Within the domain of e-commerce, the concept of attitude pertains to the overall perception regarding the utility and efficacy of virtual reality technology in

augmenting online shopping encounters. A favourable disposition towards virtual reality would enhance the likelihood of adoption in e-commerce.

2.4.1.4 Factors that influence consumer acceptance and intention to use VR.

The concept of behavioural intention pertains to an individual's inclination or willingness to utilise a specific technology, as defined by Chau and Hu (2001). In e-commerce, the concept of behavioural intention pertains to the probability that a consumer will engage in online shopping through the utilisation of virtual reality technology. An elevated level of behavioural intention is positively associated with an increased probability of adoption. While actual use refers to the degree to which individuals engage in the use of a particular technology (Davis, 1989; Rahman et al., 2017). In the context of virtual reality in e-commerce, actual use would pertain to the number of consumers who have actively used virtual reality for online shopping. Higher actual use would indicate greater adoption of the technology.

By acknowledging the various determinants that impact consumer acceptance and intention to utilise virtual reality, enterprises in South Africa can proficiently incorporate VR technologies and augment the online shopping encounter (Wang, 2021). The factors encompassed in this study consist of perceived usefulness, perceived enjoyment, trust, and the overall immersive and interactive characteristics of virtual reality experiences. Consumers' inclination to adopt and engage with virtual reality technologies is positively influenced by their perception of VR as a valuable tool that enhances their online shopping experience and provides a sense of enjoyment (deBeer & Lidie, 2024). Furthermore, the establishment of trust in virtual reality technology and the e-commerce platform serves as an additional incentive for consumers to adopt and embrace this immersive technology. The study conducted by Maican (2015) focused on investigating the various factors that impact consumers' inclination to utilise virtual reality technology for online shopping. The results of their study emphasise the significance of perceived usefulness, perceived enjoyment, and trust in influencing consumers' intention to utilise virtual reality technology. This study supports the assertion that comprehending consumers' perceptions of the utility of virtual reality in electronic commerce (e-commerce) is of significant importance for businesses operating in South Africa.

This understanding directly impacts consumers' inclination to adopt VR technology for online shopping. In a study conducted by Maican (2015), the researchers examined the utilisation of virtual reality in the context of electronic commerce (e-commerce) and its influence on consumer behaviour. The findings of the study demonstrated that virtual reality had a positive impact on consumers' perception of its usefulness, enjoyment, and their intention to utilise VR specifically in the area of online shopping. Through the utilisation of virtual environments and the provision of interactive experiences, businesses have the potential to augment the perceived utility of virtual reality within the area of electronic commerce (e-commerce), thereby fostering heightened acceptance and favourable consumer dispositions. The significance of comprehending consumer perceptions and attitudes towards virtual reality in the context of electronic commerce is underscored by the findings of Perannagari and Chakrabarti (2020), Hsiao et al. (2021), and Kim and Forsythe (2018). Fan et al. (2020) conducted a study utilising a survey methodology to investigate the adoption of augmented reality (AR) and its impact on consumers' attitudes towards products. By undertaking comparable surveys or studies that specifically concentrate on virtual reality within the e-commerce framework in South Africa, enterprises can acquire knowledge regarding consumers' perceived utility and satisfaction with VR. This information can then be utilised to make strategic choices and improve the development of VR-based shopping platforms.

2.5 Challenges of VR adoption in the South African e-commerce

2.5.1 High Cost of VR Technology as a Barrier to Adoption

One of the major challenges that hinder the adoption of VR technology in South Africa is the high cost of the technology. According to Lixandroiu (2015), the cost of VR technology is beyond the reach of most consumers in South Africa, who are primarily low-income earners. This view is supported by a recent study by Dieck and Han (2021), who found that the high cost of VR technology is a significant barrier to its adoption among online consumers in South Africa. Furthermore, most consumers lack the necessary hardware required to use VR technology, such as high-performance computers and smartphones, which further intensifies the cost burden. This limitation is particularly pronounced in the context of South Africa’s economic disparities, where only a small percentage of the population has access to the resources required to adopt advanced technologies like VR.

However, existing literature primarily emphasises the direct cost of VR technology without sufficiently addressing the indirect costs and long-term implications for e-commerce businesses. For instance, investments in VR infrastructure, training for staff, and potential modifications to websites or platforms to support VR features are additional expenses that could deter businesses from adopting the technology. While high hardware costs are often cited, less attention is paid to the ongoing maintenance costs and the potential need for specialized technical support. Furthermore, the lack of affordable, lower-spec VR devices that can function effectively in an e-commerce setting has not been sufficiently explored in the literature. Addressing these gaps could provide more comprehensive insights into how cost-related barriers influence the adoption of VR technology in South African e-commerce.

2.5.2 Lack of Infrastructure and Internet Connectivity

Another significant challenge to the adoption of VR technology in South Africa is the lack of infrastructure and internet connectivity. According to Lixandroiu (2015), South Africa has one of the lowest internet penetration rates in Africa, with only 56% of the population having access to the internet. This low penetration rate is further exacerbated by the lack of reliable infrastructure, especially in rural areas, where access to electricity and internet connectivity is limited. As such, the adoption of VR technology is hindered by infrastructural deficiencies that limit access to the technology.

While the literature acknowledges the lack of infrastructure and connectivity as barriers, it tends to overlook the variations in these challenges between urban and rural areas, as well as the different socioeconomic strata within urban regions. Most studies, such as the work by Dieck and Han (2021), treat South Africa as a homogeneous entity without considering regional disparities that significantly influence technology adoption. For instance, while urban areas like Johannesburg and Cape Town may have relatively better infrastructure and higher internet penetration rates, many rural regions face severe limitations that render VR adoption nearly impossible. This lack of nuanced analysis results in an incomplete understanding of the infrastructural barriers to VR adoption. Moreover, the literature often fails to explore potential interventions, such as public-private partnerships to improve connectivity, which could help bridge the gap and facilitate VR adoption.

2.5.3 Challenges Across Africa and Prioritization of VR Adoption

Some researchers argue that the challenges and factors affecting VR adoption in South Africa are not unique to the country but are common across the African continent. According to Kim (2022), the lack of infrastructure, the high cost of technology, and limited access to the internet are significant challenges that hinder the adoption of VR technology across Africa. This regional perspective suggests that addressing VR adoption barriers in South Africa will require broader, continent-wide initiatives rather than isolated, country-specific interventions.

While this regional approach has merit, it can sometimes obscure the unique challenges faced by South African e-commerce businesses, such as varying levels of consumer trust in technology and differing regulatory frameworks compared to other African countries (Nwaiwu, 2021). For example, the South African e-commerce market is relatively more developed than those of its neighbouring countries, which could present opportunities for tailored interventions that might not be applicable in other regions (Karine, 2021). Furthermore, the prioritization of VR adoption in South Africa has been questioned, considering more pressing socioeconomic issues. Van Zyl (2020) argues that investing in the adoption of VR technology may be seen as a misallocation of resources, given the limited benefits that technology offers to most of the population. This view, while valid, fails to consider the long-term strategic value of embracing emerging technologies like VR to position South Africa as a leader in digital innovation and to attract international investments in its growing tech sector.

Critically, the existing literature often takes a generalized view of VR adoption challenges in Africa and fails to engage with the specific context of South African e-commerce. For instance, issues such as low consumer awareness, lack of digital literacy, and concerns about data privacy have unique implications in South Africa's relatively mature e-commerce market (Ramsern & Baxodirovna, 2023). There is a need for more context-specific research that not only identifies these challenges but also explores strategies for overcoming them, considering South Africa’s distinct economic, social, and regulatory environment.

2.5.4 Limited Consumer Awareness and Acceptance of VR Technology

Another challenge identified in existing literature is the limited consumer awareness and acceptance of VR technology in South Africa. While VR is increasingly gaining popularity in other parts of the world, many South African consumers are not familiar with its applications in e-commerce, which limits their willingness to adopt the technology. As noted by Oladunjoye and Tshidzumba (2023), consumer awareness is a crucial factor in technology adoption, and the lack of awareness in South Africa presents a significant barrier. Moreover, some consumers view VR technology as complex and intimidating, leading to a lack of interest in engaging with it.

The literature often highlights consumer awareness as a barrier but does not delve deeply into the root causes of this issue or potential solutions. For instance, the role of cultural perceptions, educational outreach, and marketing campaigns in shaping consumer attitudes towards VR is rarely addressed in depth (Mankhili, 2023). Additionally, there is little exploration of the impact that increased consumer exposure to VR technology, such as through experiential pop-up events or virtual reality demonstrations in retail environments, could have on enhancing acceptance and adoption rates (Dlamini & Botha, 2024).

2.6 Research gap through Literature

A comprehensive review of the literature on augmented and virtual reality within the context of e-commerce has revealed several key research gaps. Each study examined contributes unique insights into the adoption and impact of these technologies. However, a predominant gap emerges from the lack of research specifically focused on the South African e-commerce context. This gap is particularly significant because South Africa presents a unique set of socioeconomic, infrastructural, and technological factors that influence technology adoption differently compared to other regions (Nwaiwu, 2021). A complex interplay of opportunities characterizes South Africa's e-commerce landscape. It challenges Ramsern and Baxodirovna (2023), which makes it an intriguing setting for studying the adoption of advanced technologies like VR. While the country has experienced significant growth in online retail, it still faces numerous barriers that could impact the effectiveness and widespread adoption of VR technology (van Wyk, Kajimo-Shakantu, & Opawole, 2024). These barriers include high-income inequality, uneven technological infrastructure, and low levels of digital literacy among certain segments of the population. As noted by Dieck and Han (2021), while VR adoption has been extensively studied in more

developed markets, such as North America and Europe, there is a limited understanding of how these technologies might perform in South Africa's distinct economic and social landscape.

Additionally, the South African context is marked by a disparity between urban and rural areas in terms of access to high-speed internet and advanced digital technologies (Ramsern and Baxodirovna, 2023). As a result, investigating the barriers to VR adoption in South Africa necessitates a focused exploration that considers regional disparities, consumer preferences, and the specific economic conditions that affect purchasing power and technological readiness. This gap underscores the need for a context-specific study that not only identifies the barriers to adoption but also provides insights into how these barriers can be addressed within the unique South African environment. The purpose of this study is to identify and understand the barriers that hinder the adoption of VR technology in the South African e-commerce sector. This focus differs from many existing studies that explore the impact and effectiveness of VR in enhancing the shopping experience. While those studies provide valuable insights into how VR can be used to improve consumer engagement, they often neglect to address the underlying factors that prevent the widespread adoption of the technology in regions like South Africa. For example, while Fan et al. (2020) and Lee et al. (2019) examine the cognitive and social factors influencing VR adoption in broader e-commerce contexts, their research does not delve into the barriers unique to South Africa, such as high costs, limited infrastructure, and low consumer awareness.

This study aims to fill this gap by focusing specifically on the barriers that South African consumers and businesses face when considering the adoption of VR for online shopping. By aligning with the primary research objective, the study seeks to explore how factors such as perceived complexity, high costs, infrastructural challenges, and low levels of digital literacy impede the adoption of VR technology. Understanding these barriers will enable the development of targeted strategies that are tailored to the South African context rather than relying on findings from global studies that may not be directly applicable.

2.7 Conclusion

The literature review highlights the growing significance of virtual reality (VR) in reshaping consumer experiences across various industries, including e-commerce. Although global adoption has accelerated, the integration of VR technology in South Africa's e-commerce sector remains in its nascent stages, hindered by unique contextual challenges such as limited internet

accessibility, low consumer awareness, and perceived complexities of the technology. Previous studies have demonstrated the potential benefits of VR in enhancing consumer satisfaction, trust, and loyalty by offering an immersive and engaging online shopping experience. However, for South African businesses to leverage these benefits, a deeper understanding of the specific barriers to VR adoption is necessary. Addressing these challenges through targeted initiatives, such as educational campaigns and investments in digital infrastructure, could unlock new opportunities for innovation and growth in the e-commerce space. As such, the literature underscores the need for further research to explore consumer attitudes and perceptions towards VR, providing a foundation for effective strategies that can drive VR adoption and contribute to the overall development of e-commerce in South Africa.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Introduction

The research techniques employed for the study are covered in this chapter. The research technique describes the process used for gathering, analysing, and presenting data. The study plan also addresses ethical concerns, data collection, analysis, and sampling.

3.2 Research Methodology

The study used a qualitative approach to investigate the barriers to the adoption of virtual reality in e-commerce in South Africa. The research included conducting interviews with individuals with knowledge of virtual reality technology and expertise in e-commerce. The interviews explored the usefulness of VR, VR ease of use, and consumers' attitudes, beliefs, and perceptions regarding Virtual Reality and e-commerce. The use of a qualitative research methodology was appropriate for this study because the aim was to gain a deep understanding of consumers' perspectives on virtual reality and e-commerce. Given the exploratory nature of the research and the objective of uncovering nuanced insights into consumer attitudes and barriers to VR adoption, a qualitative approach was best suited for answering the research questions. A qualitative approach allows for the exploration of complex issues in a way that quantitative research methods cannot (Kumar, 2018).

Additionally, employing qualitative methods enabled the researchers to delve into aspects of participants' experiences, unveiling intricate factors that might not be quantifiable (Corbin & Strauss, 2015). Through in-depth interviews, the study could capture the richness of opinions, emotions, and rationales behind consumer behaviours, contributing to a more comprehensive understanding of the factors impeding the integration of virtual reality in e-commerce within the South African context. This approach directly aligns with the study’s research objective, which seeks to explore barriers from a consumer’s perspective, making qualitative interviews an appropriate methodological choice.

3.3 Research Strategy

The study used a case study as a research strategy. The integration of VR technology in e-commerce is a complex phenomenon shaped by a multitude of elements, including scientific advancements, societal dynamics, and economic considerations (Lima, 2019). The use of a case study approach facilitates a comprehensive analysis of these complex variables within the setting of South Africa. This strategy was chosen because it allows the study to focus on an in-depth investigation of a single phenomenon—VR adoption in e-commerce—within a specific context, making it well-suited to explore and illustrate the intricacies involved. The case refers specifically to the use of VR technology in e-commerce by consumers in Cape Town, South Africa. The analysis centres on how a particular demographic of Cape Town residents, specifically individuals aged 18 years and older, interact with VR technology within the context of online shopping platforms.

By concentrating on this demographic within the geographical context of Cape Town, the study captures local nuances such as cultural inclinations, technological infrastructure, and economic peculiarities that may influence the adoption of VR in e-commerce (Mohammed, 2021). The selection of Cape Town as the focal point for this case study is based on its unique position as a metropolitan area with relatively high internet penetration and technological adoption compared to other regions in South Africa (deBeer & Lidie, 2022). This location provides a microcosm for understanding how local elements intersect and affect the adoption and use of VR technology in e-commerce.

The focus of the case study is not limited to a single e-commerce platform or company; instead, it encompasses various online shopping platforms and the general interactions of Cape Town consumers with VR technology in these environments (Lixandroiu, 2015). This broad approach allows for an examination of the experiences and perceptions of different users engaging with VR across multiple platforms, thus capturing a more comprehensive understanding of the barriers and opportunities associated with VR adoption in the South African e-commerce sector. The study's emphasis on consumer interactions with VR, as opposed to company-specific VR initiatives, positions it to uncover the factors driving or hindering consumer acceptance and usage (Wang, 2021).

The case study strategy, therefore, supports the research objective of identifying context-specific barriers and opportunities for VR adoption by enabling a detailed exploration of how local factors influence consumer attitudes and behaviours (Eapen, 2020). This targeted approach enhances the study's ability to derive contextually relevant insights and identify factors unique to this specific population, refining the recommendations for potential interventions or strategies to overcome these barriers. By examining how a distinct demographic within Cape Town perceives and interacts with VR in e-commerce, the study aims to contribute valuable insights that can guide both local and regional e-commerce stakeholders in their efforts to leverage VR technology effectively.

3.4 Research Design

The study employed an exploratory research design to gain insight into the research problem, focusing on the factors affecting the adoption of Virtual Reality (VR) in e-commerce in South Africa (Kumar, 2018). Exploratory research is particularly effective for investigating areas where existing knowledge is limited or phenomena have not been comprehensively studied (Tsagkias, 2021). This design was chosen because it aligns with the research objective of exploring uncharted territory regarding VR adoption in South African e-commerce, where little prior research exists. By employing an exploratory approach, the study could delve into the complexity of the subject, allowing for the identification of key factors and emerging themes that influence consumer perceptions and attitudes toward VR in e-commerce (Kumar, 2018; Tsagkias, 2021).

Through the collection of qualitative data via open-ended interviews, this design facilitated a deep exploration of the complexities surrounding the integration of VR in the e-commerce landscape. Open-ended interviews were justified as they enabled participants to freely express their views, opinions, and experiences without being restricted by predefined response options (Lima, 2019). This flexibility is crucial when exploring a relatively new phenomenon such as VR adoption in South African e-commerce, as it allows researchers to capture a broad spectrum of insights and uncover variables that may not have been previously considered. In addition, it fosters an environment where participants can provide detailed accounts of their interactions with VR technology, thereby enriching the data and providing a more nuanced understanding of the research problem (Tsagkias, 2021).

Moreover, the utilization of qualitative data collection methods allowed the research to delve into the perspectives of individuals familiar with virtual reality technology and e-commerce. The in-depth interviews were guided by a tailored interview protocol designed to elicit detailed responses regarding participants' experiences, perceptions, and attitudes towards VR in e-commerce. This method was particularly suitable for the study, as it aligned with the research objective of understanding the subjective aspects of consumer behaviour and the barriers to technology adoption, which are better captured through qualitative insights rather than numerical data (Lima, 2019; Kumar, 2018).

Given the ambiguity of the research problem and the scarcity of existing literature on this specific intersection, the exploratory design was the most suitable choice. It allows researchers to develop an initial understanding, identify variables that can inform future research, and establish a foundation for more structured studies in the future (Kumar, 2018). As noted by Robson (2002), exploratory research is particularly valuable for defining research questions and establishing a basis for future investigation when the research area is in its infancy. This approach was, therefore, ideal for this study, considering the novelty of the research problem and the lack of extensive literature on the adoption of VR in e-commerce within the South African context.

The exploratory research design enabled the researchers to generate a comprehensive understanding of the factors influencing VR adoption in e-commerce by focusing on qualitative data collection through in-depth interviews. This approach not only aligned with the research objectives but also provided a robust framework for examining an emerging phenomenon, thereby contributing to the academic discourse on VR and e-commerce in a context-specific manner. The insights gained from this exploratory study serve as a basis for future research that can build upon these findings, utilizing more structured designs to quantify and test the variables identified (Robson, 2002; Lima, 2019; Tsagkias, 2021).

3.5 Data Collection

The interview questionnaire was carefully designed to explore the key constructs influencing the adoption of Virtual Reality (VR) in e-commerce, following the framework of the Technology Acceptance Model (TAM). The questionnaire was structured into four primary sections—Demographics, Perceived Ease of Use, Perceived Usefulness, and Behavioural Intention and Actual Use—to ensure that all relevant aspects were covered comprehensively. The interview

questions were developed with a focus on obtaining in-depth responses regarding participants' perceptions, experiences, and challenges with using VR technology in e-commerce.

Part 1: Demographics

This section included questions aimed at understanding participants' backgrounds, such as age group, gender, and level of IT proficiency. It also gathered information on participants' familiarity with VR technology and their frequency of online shopping activities. These demographic variables were important to contextualize responses and assess whether factors such as age, gender, or IT skill level influenced attitudes and perceptions towards VR adoption.

Part 2: Perceived Ease of Use of Virtual Reality in E-commerce

The second part of the questionnaire focused on understanding participants' perceptions of the ease of using VR technology for online shopping. Open-ended questions were designed to elicit responses about usability issues, challenges in navigating VR environments, and any specific difficulties faced. By linking these questions to the TAM construct of perceived ease of use, the questionnaire aimed to identify specific barriers related to the complexity of VR technology.

Part 3: Perceived Usefulness of Virtual Reality in E-commerce

This section explored participants' views on the potential utility of VR in enhancing the online shopping experience. Questions focused on the perceived benefits of VR, such as its ability to offer a more immersive product exploration experience and how these benefits aligned with participants’ expectations. The questions were tailored to capture the perceived usefulness of VR in the context of e-commerce, a key construct in the TAM framework.

Part 4: Behavioural Intention and Actual Use

The final section addressed participants’ intentions to use VR for future online shopping and any previous experiences they had with the technology. By examining behavioural intention and actual use, this section aimed to capture how perceptions and attitudes towards VR translated into real-world usage. The questions were also designed to assess whether participants' actual use of VR influenced their future shopping behaviour and preferences.

The data collection process involved conducting semi-structured interviews with a total of 11 participants who were selected based on their familiarity with e-commerce and varying levels of exposure to VR technology. Participants were aged 18 and above and were recruited from Cape Town, South Africa, representing a diverse demographic range to ensure a broad spectrum of viewpoints. Each interview lasted approximately 45 to 60 minutes, allowing sufficient time for participants to elaborate on their experiences and perceptions. The interviews were conducted virtually. All interviews were audio-recorded with participants' consent to ensure accurate data capture and were subsequently transcribed verbatim for analysis.

The interviews were guided by an interview protocol (Appendix C), which included a combination of structured and open-ended questions to ensure consistency while allowing flexibility for participants to provide comprehensive responses. This approach facilitated the collection of rich qualitative data that was essential for an in-depth understanding of VR adoption in the South African e-commerce context. After each interview, the audio recordings were transcribed into text format, enabling thorough review and coding of the responses. This transcription process was critical for ensuring the accuracy and integrity of the data, providing a solid foundation for subsequent thematic analysis. To ensure the validity and rigour of the study, the interview protocol was pre-tested with two participants who were not included in the final sample. Feedback from the pre-test was used to refine the questionnaire, ensuring that the questions were clear, relevant, and aligned with the study's objectives. Additionally, an intercoder reliability check was conducted during the thematic analysis phase to verify consistency in the coding and interpretation of the data.

3.6 Population and Sampling Size

In this research, quota sampling was employed as a method of non-probability sampling to ensure a diverse representation of individuals possessing expertise in information technology (IT) and e-commerce within the population. Quota sampling involves the selection of participants based on pre-established quotas that reflect the proportion of certain characteristics in the target population (Kumar, 2018). The specific criteria used for participant selection in this study were based on individuals' expertise in IT and e-commerce, as well as their familiarity with Virtual Reality (VR) technology.

Quotas were determined by creating subgroups based on two key characteristics: level of expertise in IT and e-commerce and familiarity with VR technology. Participants were classified into three categories: (1) individuals with high expertise in both IT and e-commerce and a strong understanding of VR technology; (2) individuals with moderate expertise in IT and e-commerce and limited exposure to VR technology; and (3) individuals with basic knowledge of IT and e-commerce and little to no experience with VR technology (Lixandroiu, 2015). These categories were established to ensure a diverse range of perspectives on VR adoption, reflecting different levels of technological proficiency and awareness of VR applications in e-commerce.

A quota of four participants was set for each of the first two categories, ensuring adequate representation of individuals with high and moderate expertise in IT and e-commerce. For the third category, a quota of three participants was set to include the voices of those with a basic understanding of the subject matter. This strategic approach aimed to capture a comprehensive range of viewpoints regarding VR adoption in e-commerce and identify the unique factors influencing each group's perceptions and attitudes.

The research focused on individuals aged 18 and above residing in Cape Town, South Africa, encompassing diverse age groups to capture a wide array of viewpoints. Through quota sampling, participants with varying degrees of familiarity with VR technology and e-commerce were included, ensuring a diverse representation (Corbin & Strauss, 2015). The deliberate selection of these quotas ensured that the study encompassed insights from participants across different levels of technological expertise, enabling a holistic understanding of the factors influencing VR adoption in South Africa's e-commerce sector.

The sample size of 11 was determined based on the point of data saturation, indicating that sufficient information had been collected to address the research objectives effectively. Data saturation was reached when additional interviews did not yield new themes or insights, confirming that the quota sampling method had successfully captured a comprehensive range of perspectives (Eapen, 2020). This approach enabled the study to achieve its objective of understanding the barriers and opportunities for VR adoption in the context of e-commerce in South Africa, particularly from the perspective of individuals with relevant IT skills and industry knowledge.

3.7 Analysis

The study utilized thematic analysis as the primary method to analyze the gathered data. Thematic analysis, a qualitative research technique, involves identifying, analyzing, and reporting patterns or themes within the collected data (Braun et al., 2016). The process began with familiarizing the researchers with the data through multiple readings of the interview transcripts to gain a comprehensive understanding of the content. Following this, initial codes were generated by systematically highlighting and labelling segments of the data that were relevant to the research questions and aligned with the constructs of the Technology Acceptance Model (TAM). Codes were applied to relevant sections of the data based on key constructs, such as perceived usefulness and perceived ease of use, which were central to understanding consumer acceptance of VR technology in e-commerce (Martínez-Navarro, 2019). These initial codes were then grouped into broader themes that represented significant patterns across the dataset. For example, the code “enhanced shopping experience” was grouped under the theme “perceived usefulness of VR,” while the code “intuitive interface” was grouped under the theme “perceived ease of use.”

To ensure the reliability and validity of the identified themes, the study employed several strategies. Two independent researchers were involved in the coding process. Each researcher independently applied the initial codes to a subset of the data. The coded data were then compared to assess consistency between the researchers. Discrepancies were discussed and resolved through consensus, ensuring that the final coding was robust and reliable (Eapen, 2020).

After the themes were identified, selected participants were invited to review the findings to confirm that the themes accurately captured their experiences and perspectives. This process, known as member checking, helped validate the themes and ensured that they authentically reflected the participants' views. The analysis was further guided by the constructs of the Technology Acceptance Model (TAM), specifically focusing on perceived usefulness and perceived ease of use in relation to consumer acceptance of VR technology in e-commerce (Lixandroiu, 2015). By grounding the thematic analysis within the TAM framework, the study sought to understand how consumers perceive the utility of VR in enhancing their e-commerce experience and the degree of ease they associate with using the technology. The application of TAM provided a structured lens through which the data could be interpreted, allowing for a

nuanced understanding of the factors influencing consumers' acceptance and adoption of VR technology in online shopping (Martínez-Navarro, 2019).

Additionally, NVIVO software was used to facilitate the coding and analysis process. NVIVO allowed the researchers to organize and manage the data efficiently, enabling the visualisation of relationships between different codes and themes. This digital tool also supported the systematic application of codes, making it easier to identify recurring patterns and emergent themes within the dataset. The thematic analysis followed a rigorous process involving initial coding, theme development, and validation through intercoder reliability checks and member checking. By employing these strategies, the study ensured the credibility of the findings. It provided valuable insights into the factors affecting consumer acceptance of VR technology in South Africa’s e-commerce sector.

3.8 Ethics

Research ethics play a pivotal role in ensuring the moral conduct of research activities. In this study concerning the barriers to the adoption of virtual reality in e-commerce in South Africa, maintaining ethical behaviour was fundamental. Researchers adhered to ethical principles, particularly emphasizing the importance of obtaining informed consent from study participants, highlighting their autonomy and their freedom to withdraw from the study at any point. Ethical approval for the study to be conducted was sought from the CPUT and was approved to proceed with the data collection.

Privacy protection was a significant ethical consideration. The researchers diligently secured participants' personal data, obtained explicit permission for data usage, ensured data security, and prevented unauthorized disclosure. Additionally, fairness was ensured throughout the research process, encompassing impartial participant selection, unbiased study execution, and equitable treatment of all participant groups.

The researchers prioritized the welfare of the participants, emphasizing their physical and mental safety and carefully weighing the benefits of the study against any potential risks. Furthermore, the study aligned with the university's ethical clearance policy, respecting the guidelines and regulations set forth by the institution.

For this research, obtaining informed consent was crucial. Participants were thoroughly briefed on the study's objectives, associated risks and benefits, and their right to withdraw voluntarily. To safeguard participants' identities and privacy, pseudonyms, such as "P," will be used for data analysis purposes. These ethical considerations were pivotal in upholding the integrity of the research and ensuring the well-being and rights of the study participants.

3.9 Conclusion

This chapter detailed the research methods that were employed for the investigation. The research technique describes the procedure for collecting, processing, and presenting data. The study design also covers data collecting, analysis, sampling, and ethical issues. The results are discussed in detail in the next chapter.

CHAPTER 4 RESEARCH FINDINGS AND ANALYSIS

4.1 Introduction

The previous chapter addressed the research's design and methodological approach. The study emphasised the exploratory research design and discussed the research technique. The research used a qualitative technique. Interviews were used as a way to collect data. The data was evaluated using theme analysis methodologies to comprehend the occurrence. This chapter focuses on analysing the data collected and presents the findings. The research used a thematic data analysis technique due to its qualitative approach. A sample size of eleven participants was chosen based on achieving data saturation. This indicates that the collected data adequately addresses the research objectives. While data saturation was observed after participant 8, interviews continued for further verification.

4.2 Participants' demographical information

To provide a clearer overview of the participants' demographic details, the following table presents the distribution of age and gender among the 11 participants selected through quota sampling. As previously outlined in Section 3.6, quotas were established to ensure a diverse representation of participants based on their level of expertise in information technology (IT) and e-commerce, as well as their familiarity with Virtual Reality (VR) technology. The table below shows how these quotas were met, categorizing participants into three levels: high expertise, moderate expertise, and basic knowledge.

Table 1: Demographic Information of Participants

Participant ID	Age Range (Years)	Gender	Expertise Level	Familiarity with VR
P1	26-35	Male	High	High
P2	26-35	Male	High	High
P3	26-35	Male	High	Moderate
P4	36-45	Female	Moderate	Moderate
P5	26-35	Male	High	High
P6	46+	Female	Basic	Low
P7	26-35	Male	High	High
P8	36-45	Male	Moderate	Moderate
P9	46+	Female	Basic	Low
P10	26-35	Female	Moderate	Moderate
P11	46+	Male	Basic	Low

4.2.1 Age Distribution

The age range of participants in this research demonstrates diverse involvement with virtual reality technology for online shopping. The majority of individuals in the sample, namely 45.5%, are between the ages of 26 and 35. This is consistent with previous research indicating that younger people are the main users of innovative technology, such as VR, in online shopping, as shown in studies conducted by Kim (2022). Participants aged 36-45 years are significantly represented, suggesting an increasing interest among persons in their mid-thirties to forties. The research acknowledges the possibility of a varied user demography, where those aged 46 years

and over make up 18.2% of participants, indicating a significant interest and receptiveness to VR technology among older age groups. This complex age distribution highlights the need to take age-related aspects into account when studying views and attitudes about the use of VR in online buying, as highlighted in Martínez-Navarro (2019) research. The results provide useful insights into the various age groups using VR technology for online shopping and add to the wider discussion on technology adoption across different demographics.

4.2.2 Gender

The survey shows that the majority of participants are male, making up 72.7% of the sample, with females accounting for 27.3%. This gender distribution is consistent with the general pattern seen in technology-related disciplines, where males typically have greater representation, as noted in research by Hsiao and Yang (2011) and Komito (2019). The significant overrepresentation of males highlights the existing gender disparity in technology use, emphasizing the need for initiatives to encourage gender diversity and inclusiveness in the utilization of innovative technologies such as virtual reality (VR) for online shopping. Although women are not as well-represented in this study, their viewpoints remain critical for understanding gender-specific attitudes and preferences regarding VR technology in e-commerce, as highlighted in studies by Mon (2020) and Martínez-Navarro (2019). The quotas established in the sample selection aimed to include at least three females to ensure that their perspectives were adequately captured despite the male dominance in technology adoption. By intentionally including a mix of genders, the study sought to provide a balanced view of the factors influencing VR adoption in online shopping. The results highlight the importance of addressing gender inequalities in technology use and ensuring equitable access and participation among genders to fully leverage the potential of VR in enhancing online shopping experiences.

4.3 Thematic Analysis

This research was driven by a comprehensive analysis of the constraints that prevent the integration of virtual reality (VR) into the landscape of E-commerce in South Africa. Anchored in this overarching aim, the research objectives were meticulously crafted to navigate the complex terrain of consumer perceptions and attitudes towards VR technology. The interview guide, carefully crafted to match these aims, acted as the channel via which the core of customer viewpoints was extracted. As participants responded to the thought-provoking questions, the main

point of the research became clear, uncovering valuable insights that were intricately connected to the Technology Acceptance Model (TAM). Using a thematic analysis approach, the examination of data revealed four prominent themes that align closely with the main goals of the study. These themes, emerging as testimonies of the study's fruition, not only deciphered consumers' perceptions of VR's usefulness and usability but also provided a nuanced understanding of the intricacies governing their adoption within the realm of E-commerce. Thus, in essence, the thematic analysis served as the validating lens through which the study's aim and research questions found resounding clarity and affirmation.

Table 4.1 Themes, Sub-themes, Objectives, Sub-Questions and Main Research Question

Themes	Sub-themes	Objectives O1 - O4	Sub-Questions SQ1 - SQ2	MRQ
Theme 1: Perceived Ease of Use	A: Ease with Training	O1	SQ1	What are the barriers to the adoption of virtual reality in e-commerce in South Africa?
	B: Virtual vs. Physical Shopping	O1	SQ1	
	C: Potential Challenges	O1	SQ1	
Theme 2: Perceived Usefulness	A: Expense and Availability of VR Headsets	O2	SQ2	
	B: Lack of Adoption by E-commerce Platforms	O2	SQ2	
	C: Remote Product Examination	O2	SQ2	
Theme 3: Attitude	A: Inevitable Impact	O2	SQ2	
	B: Positive Impact on Decision Making	O2	SQ2	
	C: Anticipation to Use	O2	SQ2	
	D: Favourable Intention	O2	SQ2	
Theme 4: Actual Use	A: Product Categories and usability (behavioural ease of use)	O2	SQ2	
	B: Concerns about Product Fit and Return Policies (Actual Use)	O2	SQ2	
	C: Influence on Willingness to Use	O2	SQ2	

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4.3.1 Theme 1: Perceived Ease of Use

When examining the complex terrain of virtual reality (VR) use in the field of e-commerce in South Africa, it was crucial to investigate consumer opinions and perspectives thoroughly. By analysing the feedback obtained from participants through structured interviews, this research explores the main concept of "Perceived Ease of Use" and its related subthemes. Within the complex realm of user experience, the key aspects of "Ease with Training" and "Virtual vs. Physical Shopping" stand out as crucial reference points, revealing at the same time the underlying "Potential Challenges" associated with the use of virtual reality in e-commerce environments. As this investigation unfolds, it seeks to address sub-question two (SQ2):" How do South African consumers perceive the ease of use of Virtual Reality in E-commerce?" By analysing this theme and its subthemes, the study got a thorough grasp of the obstacles that are preventing the widespread use of virtual reality in the e-commerce industry in South Africa.

Table 4.2: Subthemes of Theme 1: Perceived Ease of Use

Subthemes
Ease with Training
Virtual vs. Physical Shopping
Potential Challenges

Table 4-1 lists subthemes aligned to Theme1 – Perceived Ease of Use

Subtheme: Ease with Training

The subtheme "Ease with Training" examines participants' views on the ease of learning and using virtual reality (VR) technology, particularly for online shopping. The majority of participants expressed optimism about the usability of VR in e-commerce when responding to the question, "Would you consider VR easy to use for e-commerce?" Participants (P1, P2, P5, P10) highlighted the technology's potential to improve the shopping experience by providing accurate product

visualisation and efficient navigation. This finding is consistent with previous research conducted by Hsiao and Yang (2011), who emphasise d the importance of perceived ease of use in the Technology Acceptance Model (TAM). Their study found that people are more likely to adopt technology when it is perceived as user-friendly, aligning with participants' recognition of VR's immersive qualities and intuitive interface.

Participants with a background in gaming (P1, P2) found VR particularly user-friendly and drew parallels between the interactive nature of VR and gaming experiences. This observation aligns with research by Mon (2020), who noted that prior exposure to interactive technologies like gaming could enhance users' ease of adoption and reduce the learning curve associated with using VR for other applications, including online shopping. Such experiences make the transition to VR technology in e-commerce smoother, as users are already familiar with navigating and interacting within virtual environments. Despite these positive perceptions, participants also acknowledged potential obstacles such as connectivity problems, variations in platform layout, and the need for adequate instruction, especially for persons less acquainted with online purchasing and VR technologies. This concern reflects the findings of Davis et al. (2021), who emphasise d that providing thorough user training is crucial for promoting the usage of VR technology. Their research indicated that when users are given sufficient training and support, their proficiency in using VR increases significantly, which, in turn, enhances the likelihood of adoption.

Participant 10 (P10) expressed, "*Yes, I don't see difficulties in using virtual reality for online shopping, and it can make shopping very easy. If proper training can be provided, everyone will find it so easy to use virtual reality, including old people.*" While **Participant P2** alluded that, *"I would consider it to be, it is straightforward to use. So what I enjoyed the most was the fact that I am getting a video and did in 3D view of the product and the purchase and it was much more realistic than just a picture that was taken. So that's an actual object that you can, you know, you can see what it looks like."*

Participant 11 (P11) offered a slightly unique perspective compared to the others. They stated, "*I'll consider it as a tool that will be easy to use, It will depend on the setup on that particular e-commerce platform. I'm not sure about the adults though, but the young ones, those that are used to buying online may not find it difficult. But for someone who's not used to online shopping and then it might be slightly difficult*."

Participant P11 recognises the potential convenience of using virtual reality (VR) in E-commerce. However, they emphasise the significance of properly setting up the platform and ensuring that users, especially older persons who may not be experienced with online purchasing, are comfortable using it. They propose that younger generations who are acclimated to online purchases may find the integration of virtual reality (VR) more effortless. However, persons who are less comfortable with online shopping can encounter difficulties with VR technology. This viewpoint brings a more detailed understanding to the conversation by considering the diverse levels of user experience and familiarity with technology across various demographic groups. Davis et al. (2021) study on virtual reality and its impact on destination marketing acknowledges the crucial need of user training in promoting the usage of VR technology. The research indicates that offering thorough training is crucial for users to become skilled in using VR, in line with participants' concerns about the learning process involved in VR buying.

Hsiao and Yang (2011) add to the literature by highlighting the importance of perceived ease of use in the Technology Acceptance Model (TAM). Their research highlights that people are more inclined to embrace and use technology when they see it as user-friendly. This corresponds to participants' observations on how easily they may get acquainted with VR technology for shopping. Research indicates that improving the learning process leads to a favourable user impression and increased adoption of VR technology. This highlights the significance of the "Ease with Training" subtheme in the realm of VR-based online commerce.

Subtheme: Virtual vs. Physical Shopping

"Virtual vs. Physical Shopping" explores how participants compare the unique experience of purchasing via virtual reality to more conventional physical shopping. The majority of participants answering the question, "In your opinion, would make it easy or challenging to navigate during online shopping?" expressed positive sentiments towards the ease of use of virtual reality (VR) in E-commerce. They emphasised the immersive quality of VR settings, highlighting that navigating via virtual stores seems natural and substantial, frequently surpassing the ease of regular internet buying. P2, P8, and P9, among others, observed that virtual reality (VR) technology offers a heightened level of interactivity and immersion when it comes to purchasing, particularly when investigating items such as automobiles or homes. Nevertheless, several participants also recognised possible obstacles, such as early confusion or intricate navigation processes, indicating the need for enhanced design arrangements to augment user involvement and

effectiveness. In general, most participants expressed optimism about the applicability of virtual reality (VR) in the field of electronic commerce (E-commerce). At the same time, they also mentioned the need for improvements to enhance the user experience. Participants provide their viewpoints on the differences between these two purchasing methods, giving insights into the distinctive features of the VR shopping experience. This subtheme aims to gather participants' insights on the comparison between the virtual shopping experience and the conventional in-store shopping familiarity. The comparison highlights the perceived benefits or limitations of VR purchasing in relation to the real buying experience. This aligns with the findings of Hsiao and Yang (2011), who noted that technologies offering a high level of perceived ease of use are more likely to be accepted by users. Participants emphasised the immersive quality of VR settings, which they felt made navigating virtual stores seem natural and substantial, often surpassing the ease of regular internet shopping. These observations reflect Mon's (2020) research, which highlighted the potential of VR to create more engaging and interactive shopping environments compared to traditional online platforms.

Participant 8 (P8) shared, *"I think the answer is probably if you can use virtual reality to explore the actual product then. So, like a house or a car like, you know where you can make someone sit inside of the car then, like it would make it easy."*

Participant 9 (9) expressed*, "No, it wouldn't be challenging at all because the way I understand virtual reality, it's creating this virtual world for you as if you are at the shop already. Being in the shop physically and begin in a virtual shop don't make much of a difference, it should be easy to navigate around."*

However, Participant 10 presented a contrasting perspective to the prevailing majority. They expressed worries about possible obstacles to user experience while integrating VR technology into E-commerce. Participant 10 reported feeling disoriented after using virtual reality (VR) for gaming, suggesting that this might affect the comfort and confidence of users during virtual shopping experiences. In addition, they observed the difficulty of manoeuvring around VR purchasing platforms, namely the iterative process involved in choosing and testing out products. Participant 10 proposed investigating other navigation choices to improve user involvement and effectiveness, highlighting the need to optimise the virtual reality shopping experience to address possible usability problems.

Participant 10 (P10) highlighted**,** *"It is crucial to consider potential user experience barriers when implementing VR technology in e-commerce. The potential for disorientation, as I experienced after using VR for gaming, should be carefully evaluated and mitigated to optimize user comfort and confidence during virtual shopping sessions. Perhaps you may not know the direction in which to move down the aisle or to the item, but once you have the hang of it, I think maybe on the second try or so, it would be much easier."*

Kim (2022) explores how virtual reality might improve e-commerce in the post-COVID retail industry, which is pertinent to the participants' thoughts. Kim highlights the potentially disruptive effect of VR on the retail industry in agreement with participants who recognise the unique aspects of VR purchasing. Mon (2020) predicted VR adoption on e-commerce platforms using the Technology Acceptance Model (TAM) to investigate participants' perspectives on shifting from physical to virtual buying. Mon's observations emphasise how the smoothness of this transition plays a key role in affecting user adoption of VR for online shopping. This literature offers a theoretical framework for participants to analyse the comparative elements of "Virtual vs. Physical Shopping" in the context of VR-enabled e-commerce.

Subtheme: Potential Challenges

The subtheme "Potential Challenges" explores participants' views on the hurdles and challenges associated with integrating virtual reality (VR) technology into online shopping. Ten out of the eleven participants expressed concerns regarding infrastructure challenges, specifically slow page loading and connectivity issues, which are further exacerbated by factors such as load shedding. These observations resonate with Martínez-Navarro's (2019) research, which identifies technical infrastructure as a primary barrier to VR adoption in e-commerce. Participants highlighted that the inconsistent availability and quality of internet connectivity could significantly impact the effectiveness and usability of VR shopping experiences. This issue is particularly pertinent in the South African context, where infrastructural limitations such as sporadic internet access and power outages can hinder the smooth operation of VR technologies in e-commerce.

Most participants emphasised the need for increased exposure to VR technology to improve comfort and familiarity, as they faced usability challenges due to differing degrees of technical knowledge. This sentiment aligns with Mon (2020), who applied the Technology Acceptance Model (TAM) to forecast the adoption of VR in e-commerce and emphasised that enhancing

familiarity and perceived ease of use is crucial for encouraging technology adoption. Participants noted that a lack of adequate knowledge or training could result in a steep learning curve, thereby deterring potential users. For instance, P7 suggested that resources such as manuals and online tutorials could help mitigate these challenges, reinforcing the assertion of Davis et al. (2021) that comprehensive user education is necessary to facilitate VR adoption. Furthermore, concerns were raised about the suitability and quality of items presented in VR transactions, underscoring the need for accurate product depictions in virtual environments. Participants expressed apprehension about whether the visual quality and fidelity of VR models would align with the real-world product, which could influence their purchasing decisions. This echoes Komito's (2019) findings, which emphasise that discrepancies between virtual representations and actual products can lead to consumer distrust and reluctance to engage in VR-based shopping.

Participant 7 (P7) mentioned, *"While there's always a learning curve involved with any new technology, resources like manuals and online tutorials, such as YouTube videos, can be helpful in overcoming initial hurdles."*

Participant 4 (P4) expressed*, "In my experience, the biggest hurdle to adopting online shopping was a combination of security concerns and usability challenges. The uncertainty surrounding the security measures employed by online platforms and the potential for connectivity issues, particularly in certain areas, made me apprehensive about making the switch."*

Only participant 6 expressed a different viewpoint compared to the majority. They stated: "*I haven't faced any significant difficulties with using VR. While there's always a learning curve involved with any new technology, resources like manuals and online tutorials, such as YouTube videos, can be helpful in overcoming initial hurdles. While the immersive experience of VR is exciting, connectivity can sometimes be a hurdle. However, it's important to differentiate between VR-specific connection challenges and limitations inherent to the user's device and internet infrastructure. For example, ensuring a stable internet connection on the user's computer or other device is crucial for a smooth VR experience.*"

The reaction of this participant differs from the concerns expressed by others about the difficulties in infrastructure and usability. They recognise the possibility of connection concerns but propose that with sufficient money and assistance, these difficulties may be overcome. The authors stress the need to differentiate between concerns particular to virtual reality (VR) and more general

connectivity issues. They underscore the necessity of a reliable internet connection for achieving the best possible VR experiences. In general, their viewpoint offers a more positive assessment of the practicality of VR technology in the realm of E-commerce. Martínez-Navarro's (2019) research explores how virtual reality impacts e-commerce and identifies obstacles that might hinder the broad use of VR technology. Martínez-Navarro's study offers a theoretical framework that corresponds to participants' views on the obstacles related to VR buying. Mon (2020) highlights the need to identify possible obstacles, which is particularly relevant in this situation. Mon's research uses the Technology Acceptance Model (TAM) to forecast the adoption of VR in e-commerce, emphasising the need to acknowledge and overcome obstacles for a more precise projection of VR adoption. This subtheme illuminates the many problems that participants anticipate in incorporating VR technology into online purchasing by combining their worries with the results of relevant research.

4.3.2 Theme 2: Perceived Usefulness

The study examined the opinions of South African customers on the practicality of Virtual Reality (VR) in the context of E-commerce. The participants took part in detailed interviews facilitated by a structured interview guide. Through these conversations, emerged a thematic focus on Expense and Availability of VR Headsets, Lack of Adoption by E-commerce Platforms, and Remote Product Examination. These subthemes were derived from the overarching theme of Perceived Usefulness, which served as a lens through which to examine the first sub-question (SQ2), " What are the barriers to perceiving the usefulness of, attitude to, and actual use of virtual reality in South African e-commerce?". This study examined the obstacles preventing the acceptance of virtual reality technology in the South African E-commerce industry, focusing on the intricate connections between consumer behaviour, technical progress, and business strategies.

Table 4.3: Subthemes of Theme 2: Perceived Usefulness

Subthemes
Expense and Availability of VR Headsets
Lack of Adoption by E-commerce Platforms
Remote Product Examination

Table 4-2 list the subthemes derived for Theme 2 – Perceived Usefulness.

Subtheme: Expense and Availability of VR Headsets

The subtheme "Expense and Availability of VR Headsets" delves into participants' opinions on the price and accessibility of virtual reality (VR) equipment, particularly headsets, and how these factors influence their assessment of VR's usefulness for online shopping. The majority of participants (10 out of 11) expressed concerns about the high cost and limited availability of VR devices, citing these as significant obstacles to their adoption of VR technology in e-commerce. When asked the question, "Are there any obstacles that deter you from using VR for online shopping?" participants consistently highlighted the prohibitive pricing of VR headsets and the restricted access to VR-enabled platforms in South Africa. These concerns are mirrored in Kim's (2022) study, which acknowledges that the cost of VR headsets is a key barrier to widespread adoption, particularly in emerging markets where economic constraints play a significant role in consumer decision-making.

Participant 10 (P10) expressed, *"The VR devices are expensive. And most of the online stores have not implemented VR for shopping, but it's something I'm looking forward to using."*

Participant 8 (P8) mentioned, *"Maybe where they are mostly based on the pricing is expensive to get the headset for it. And VR is available on certain ecommerce sites, so not all of them like in South Africa have that availability of VR and there's no word of mouth for it."*

While the other participants voiced apprehensions or doubts about several elements of VR technology in E-commerce, such as its accessibility, affordability, and data security, Participant 5 stood out for their inquisitiveness and enthusiasm to investigate the possibilities of VR buying. Participant 5 (P5) had a distinct perspective compared to the others, showcasing a considerable degree of inquisitiveness and receptiveness towards virtual reality (VR) technology. They stated: *"I must admit, the concept of VR shopping is entirely new to me. This is a fascinating development in the retail landscape, and I'm eager to learn more about its potential and application."*

While other participants raised concerns about accessibility, pricing, and data security, P5 stood out by displaying a favourable attitude towards VR purchasing. They exhibited a strong interest and excitement for investigating the potential of this technology. Their reaction demonstrates a readiness to accept and use innovative technology, indicating a possible inclination to be among the first to adopt them. This stands in contrast to the general doubtfulness noticed among other participants. Mon's (2020) study on VR adoption in e-commerce emphasises the need to understand aspects like the price of VR equipment for precise predictions. The research focuses on how participants see economic factors as key influencers in deciding to use VR for online purchasing. Kim (2022) acknowledges the constraints related to the cost and accessibility of VR headsets in his study on how virtual reality might improve e-commerce. The subtheme offers unique insights into how economic factors influence participants' perception of the usefulness of VR technology in online shopping by combining participants' viewpoints with relevant research via triangulation.

Subtheme: Lack of Adoption by E-commerce Platforms

The subtheme "Lack of Adoption by E-commerce Platforms" explores participants' concerns regarding the slow integration of virtual reality (VR) technology by major e-commerce platforms. Most participants, when asked the question, "Do these barriers relate to difficulties in using VR technology or doubts about its convenience in e-commerce?" expressed mixed feelings. While many participants acknowledged the ease of use and potential benefits of VR, such as enhancing shopping experiences and providing greater immersion, they also highlighted several barriers, including security concerns, insufficient information, affordability, and limited accessibility. The majority of participants emphasise d that for VR technology to deliver tangible value to e-commerce, it must provide clear benefits like improved efficiency and enhanced user experiences. This sentiment aligns with Mon’s (2020) findings, which emphasise the need for VR technology

to deliver on its promises to truly transform online shopping. Without widespread integration of VR into mainstream e-commerce platforms, participants felt that the technology would struggle to gain traction.

Participant 11 (P11) mentioned, *"It's not just about user difficulty that's holding back VR shopping. The lack of adoption by major e-commerce platforms has a significant impact on its potential reach and impact."*

Participant 8 (P8) showed, *“I don't doubt it's convenience based on these barriers. These are just my barriers are based mostly on a pricing and accessibility. So, if the pricing there were lower prices or they were available, for example, if you can go into a shop and then they have like a studio for you to put on those headsets and then do your shopping there.”*

Nevertheless, there were other participants, namely P4, P6, and P10, who provided distinct viewpoints on the obstacles to the adoption of virtual reality in E-commerce. These viewpoints were around particular factors such as security apprehensions, cost, ease of use, and the incorporation of VR into prominent E-commerce platforms. Their replies highlight the complex and diverse nature of customer views and concerns about VR technology. P4 addressed the security issues related to the convenience of platforms such as Takealot, emphasising the possible hazards of electronically storing and sending personal information. P6 emphasised the importance of cost and accessibility obstacles in hindering the adoption of virtual reality (VR), proposing that reducing prices and establishing actual VR retail venues might improve convenience. In addition, P10 highlighted the consequences of major E-commerce platforms not including VR technology, indicating that despite this obstacle, VR purchasing might still be easy. The many perspectives demonstrate the intricate nature of customer decision-making and the various aspects that affect how VR is perceived in the E-commerce industry. Kim's (2022) study emphasises the possible revolution of the retail industry by using virtual reality, showcasing its attractive opportunities. Comments from participants P8 and P10 highlight the discrepancy in the acceptance of VR technology by significant businesses in the e-commerce sector, showing a slow pace in implementation. The difference between the promise shown in research and the difficulties faced during implementation, as seen in users' experiences, highlights the difficulty of incorporating VR into popular online purchasing platforms.

Subtheme: Remote Product Examination

The subtheme "Remote Product Examination" focuses on participants' views regarding the ability to thoroughly inspect products in a 3D setting without being physically present. When asked the question, "In what ways do you believe VR enhances or could enhance your overall shopping encounters compared to traditional online methods?" the majority of participants expressed a strong preference for the enhanced product visibility and immersive experience offered by virtual reality (VR) in e-commerce. This aligns with Mofokeng's (2021) findings, which emphasise the role of VR in improving consumer satisfaction by allowing remote users to conduct a comprehensive 360° examination of products. Participants highlighted how VR technology enables them to obtain detailed perspectives of items, including dimensions, colours, and quality, which are often difficult to assess through conventional online shopping methods. This sentiment mirrors the research by Marasco et al. (2018), who found that advanced virtual technologies, such as VR, offer an immersive and in-depth product evaluation experience that bridges the gap between digital and physical shopping. Participants consistently pointed out that the level of scrutiny VR provides creates a sense of authenticity and confidence in their purchasing decisions, something that traditional online shopping often lacks.

Participant 10 (P10) stated, *"For customers in remote locations, traditional online shopping often lacks the opportunity to thoroughly examine products in a 3D environment. This can be a significant limitation, as customers are unable to fully visualize the product from different angles and perspectives."*

Participant 6 (P6) expressed, *"VR shopping allows for a closer and more detailed examination of products, providing a level of scrutiny comparable to a traditional shopping experience."*

Within the group, there were a few individuals whose viewpoints differed somewhat from the majority. P1, a participant, emphasised the practical advantages of virtual reality (VR) in E-commerce. They underlined how VR improves product visibility and removes geographical obstacles to accessing virtual storefronts. This perspective highlights the participant's emphasis on the pragmatic benefits of virtual reality rather than its immersive characteristics. While other participants may have emphasised the immersive qualities of virtual reality (VR) and its capacity to recreate physical shopping experiences, P1 highlights the practical benefit of enhanced product visibility and the removal of geographical obstacles when visiting virtual storefronts. This perspective highlights the range of viewpoints among participants about the anticipated advantages of virtual reality in electronic commerce. P5 was another participant whose opinion

diverged from the majority. P5 had a perspective that deviated somewhat from the prevailing consensus. They mentioned, *"As I said that in combining both traditional and VR so far, we'll make it unique to traditional and could make a shopping experience immersive."*

Participant 5 seems to support a hybrid strategy, which integrates aspects of both conventional internet shopping and virtual reality (VR) to provide a distinctive and engaging buying experience. Participant 5 diverges from the majority by proposing that combining VR with conventional techniques might provide a unique advantage, in contrast to those who just highlight the benefits of VR over traditional methods. This perspective emphasises the variety of viewpoints among participants on the best method for integrating virtual reality (VR) into the field of electronic commerce (E-commerce) in South Africa.

Mofokeng's (2021) study focuses on how online shopping features affect consumer happiness, highlighting the importance of virtual reality in offering clients in distant areas a comprehensive 360° view of products. This confirms that virtual reality may improve the online buying experience by providing distant users with a more comprehensive product inspection. Marasco et al. (2018) explore the use of advanced virtual technologies in destination marketing, proposing that VR may act as a connection for people who are not physically there. The subtheme highlights how VR may help consumers in distant areas overcome geographical obstacles and provide a more immersive product evaluation experience by combining their thoughts with relevant research.

4.3.3 Theme 3: Attitude

The study focused on examining the opinions of South African customers on the incorporation of Virtual Reality (VR) in E-commerce. To do this, we conducted a thematic analysis of the replies provided by participants to the questions indicated in the interview guide. The study revealed the main subject of "Attitude," which included three important subthemes: "Inevitable Impact," "Appealing to the Younger Generation," and "Positive Impact on Decision Making." These subthemes were derived from the research questions probing how South African consumers perceived the usefulness and ease of use of VR in E-commerce. The research examines the obstacles hindering the acceptance of virtual reality (VR) in South Africa's e-commerce field. It sheds light on the intricate viewpoints and attitudes that influence how customers perceive and embrace this growing technology.

Table 4.4: Subthemes of Theme 3: Attitude

3: Subthemes
Inevitable Impact
Positive Impact on Decision Making
Anticipation to Use
Favourable Intention

Table 4-3 sets out the subthemes linked to Theme2 – Attitude.

4.3.3.1 Subtheme: Inevitable Impact

The subtheme titled "Inevitable Impact" investigates the perspectives of the participants in relation to the anticipated inevitability of the impact that virtual reality will have on online commerce. The majority of participants, when asked the question, "What is your overall perception regarding the utility and efficacy of VR technology in augmenting the online shopping experience?" expressed a strong belief in the potential benefits of VR for enhancing e-commerce in South Africa. Their optimism is based on the technology's ability to boost sales, improve customer satisfaction, and

create more engaging and immersive shopping experiences. This aligns with Martínez-Navarro's (2019) investigation, which also pointed to VR's transformative potential in the retail sector. Nevertheless, there are reservations over the preparedness of various consumer groups to adopt VR, as some individuals voice apprehensions about their technological proficiency and the perceived authenticity of virtual encounters. However, the majority of participants strongly believe that virtual reality (VR) is an unavoidable aspect of the future of online shopping. They believe that VR has the power to completely change the way consumers engage with goods and brands, presenting significant potential for transformation. A favourable attitude towards the incorporation of virtual reality technologies is reflected in the participants' expression of the idea that virtual reality is set to play a crucial role in determining the future of online commerce. The subtheme titled "Inevitable Impact" investigates participants' perspectives on the anticipated inevitability of virtual reality (VR) technology's influence on online commerce.

Participant 10 (P10) expressed, *"In my opinion, VR's impact on online shopping is inevitable. While acknowledging potential usability challenges, it ultimately creates an immersive visual experience that transcends traditional 2D limitations."*

Participant 8 (P8) highlighted*, "While early adopters with a strong understanding of technology may embrace VR shopping, widespread acceptance could be challenged by anxieties among less tech-familiar users who might fear the perceived realness of the virtual experience or struggle with technical aspects."*

P5 and P9 provided alternative viewpoints that diverged little from the prevailing consensus. P5 raised worries over the possible obstacles in attaining broad adoption of VR technology in E-commerce, mostly owing to apprehensions among users who are less comfortable with technology. P5 stated: *"While early adopters with a strong understanding of technology may embrace VR shopping, widespread acceptance could be challenged by anxieties among less tech-familiar users who might fear the perceived realness of the virtual experience or struggle with technical aspects."*

However, P9 highlighted the significant impact of VR technology on improving online shopping experiences, emphasising its capacity to bridge the divide between online and brick-and-mortar retail. The contrasting perspectives highlight the intricate nature of how VR adoption in E-commerce is seen, combining both cautious scepticism and hopeful expectation of its effects.

Martínez-Navarro (2019) investigated on the effect of virtual reality on e-commerce. This investigation coincides with the views of the participants, providing support for the idea that virtual reality is expected to have a significant impact on the landscape of online purchasing. The participants' conviction that virtual reality would play an unavoidable part in the development of the future of online commerce is strengthened by the literature research. The optimistic perspectives that were expressed by the participants with regard to the transformative potential of virtual reality in the realm of online shopping are in line with the academic discourse on the topic. This highlights the general agreement that virtual reality is anticipated to have a significant and long-lasting impact on the future of e-commerce.

4.3.3.2 Subtheme: Influence on Decision-Making

The subtheme titled "Influence on Decision Making" investigates the viewpoints of the participants in relation to the ways in which virtual reality impacts their intents and choices throughout the process of online buying. The majority of participants (except 3), when asked the question, "How would VR influence your willingness or inclination to use this technology for future online purchases?" expressed a positive outlook towards the integration of virtual reality (VR) in E-commerce, citing factors such as convenience, enhanced shopping experiences, and trust in VR technology. The user emphasises the attractiveness of being able to access a diverse selection of items from the comfort of their own home, the possibility of engaging in immersive product experiences, and the impact of virtual reality on their buying choices. In general, participants express a readiness to use VR technology for future E-commerce operations, highlighting its capacity to revolutionise the online purchasing environment in South Africa. The participants have expressed the idea that virtual reality has a key influence in changing their decision-making, which ultimately results in shopping decisions that are more informed and confident. These findings align with Mon’s (2020) forecast on the adoption of virtual reality in e-commerce, which highlighted that VR can significantly influence consumer decision-making by providing a more immersive and detailed understanding of products.

Participant 9 (P9) stated, *"The level of effort a company invests in showcasing their product speaks volumes. I'm more likely to trust and purchase from a company that utilizes immersive technology like VR to provide a comprehensive understanding of their product."*

Participant 8 (P8) mentioned*, "I will come and I wouldn't even skip a day if it's the day that day or two that I'm there again, even if I'm just putting stuff in my cart without actually checking it out."*

Notable variations in opinions on the incorporation of virtual reality (VR) in E-commerce were seen among the participants. Although most individuals reported favourable sentiments about VR purchasing, highlighting convenience and improved experiences as primary incentives, P6 presented a contrary viewpoint. The relevance of firms' use of immersive technology, such as virtual reality (VR), to present items was emphasised. The value of developing trust via these means was highlighted. P6 stated, *"The level of effort a company invests in showcasing their product speaks volumes. I'm more likely to trust and purchase from a company that utilizes immersive technology like VR to provide a comprehensive understanding of their product, as opposed to relying solely on static images."*

However, P10 and P11 had similar opinions to the majority, emphasising convenience and good experiences as the main reasons for their desire to use VR technology in E-commerce. The many perspectives highlight the intricate nature of consumer attitudes towards the adoption of virtual reality (VR) in South Africa. These ideas include a combination of incentives motivated by convenience and the need to establish trust via immersive experiences. Although P10 and P11 have good opinions regarding VR purchasing, their main emphasis is on convenience and enjoyable experiences as the primary motivators. Participant 6 distinguishes itself by highlighting the significance of organisations' endeavours in using immersive technologies such as virtual reality (VR) to establish trust and sway purchase choices.

The observations made by the participants are consistent with Mon's (2020) forecast of virtual reality adoption on e-commerce platforms. This highlights the potential beneficial influence that VR may have on decision-making when it comes to online buying. In order to support the opinions of the participants, the literature study highlights the possible beneficial influence that virtual reality might have on decision-making processes in online buying. In addition to contributing to the academic debate, Mon's forecast highlights the significance that virtual reality plays in improving the decision-making capacities of online customers. Reiterating the idea that virtual reality might favourably affect decision-making in the context of e-commerce, the overall experiences and views of the participants are consistent with the conversations that have taken place in academic circles.

4.3.3.3 Subtheme: Anticipation to Use

Specifically, the subtheme titled "Anticipation to Use" investigates the anticipation and enthusiasm that participants have over the potential use of virtual reality in online purchasing in the future. The majority of participants, when asked the question, "How would VR influence your willingness or inclination to use this technology for future online purchases?" expressed enthusiasm and willingness to embrace virtual reality (VR) in E-commerce due to its perceived convenience, efficiency, and immersive shopping experiences. They emphasise the attractiveness of being able to access a diverse selection of items from the convenience of their own homes, saving the time and effort often used on in-person shopping excursions. Furthermore, participants highly appreciate the capacity of VR technology to provide authentic virtual experiences, which enhances their trust in making purchasing choices. Trust and credibility are key factors, as participants prefer organisations that use virtual reality (VR) to provide a full display of their goods. In general, participants express a favourable change towards online buying made easier by virtual reality (VR) technology, suggesting a high possibility for its acceptance in South Africa's E-commerce industry. A readiness to accept and make use of virtual reality technology in their future encounters with online shopping is shown by the participants' favourable sentiments and eagerness to embrace virtual reality technology with enthusiasm.

Participant 6 (P6) mentioned, *"If my initial experience lives up to expectations, I'm confident I'll be using it regularly. The ability to confidently make purchase decisions based on a realistic virtual experience is a major incentive for me."*

Participant 9 (P9) expressed*, "I would definitely be in favour of using it because I'm actually starting to like online shopping."*

Amidst the prevalent excitement for integrating virtual reality (VR) in E-commerce, a few opposing perspectives surfaced among the participants. Although most interviewees highlighted the simplicity and efficiency of VR technology, a few individuals expressed differing viewpoints. P6 emphasised the significance of trust and credibility, indicating that the degree of effort invested in presenting items via virtual reality influences their buying choices. P6 stated, *"The level of effort a company invests in showcasing their product speaks volumes. I'm more likely to trust and purchase from a company that utilizes immersive technology like VR to provide a comprehensive understanding of their product, as opposed to relying solely on static images."*

However, Participant 9 emphasised that their previous favourable encounters with VR purchasing had a significant role in shaping their inclination to use it for future purchases. These viewpoints provide useful insights into the many factors that influence customers' perceptions towards virtual reality in electronic commerce. These nuanced viewpoints provide insight into the many aspects that influence customers' opinions towards VR in E-commerce, revealing the intricate interaction of factors beyond just convenience and efficiency. This subtheme is supported by the investigation of virtual reality and its implications for destination marketing, which was conducted by Chuah (2018). The author brought attention to the role that expectation and excitement play in pushing the adoption of virtual reality technology. The scientific debate that was offered by Chuah (2018) agrees with the participants' optimistic expectations, which suggests that the prospect of utilising virtual reality may be a substantial incentive for embracing this technology. The participants' comments of excitement and readiness to adopt virtual reality for online purchasing connect with the academic discourse, underlining the potential influence that positive anticipation may have on the successful integration of VR into e-commerce platforms.

4.3.3.4 Subtheme: Favourable Intentions

Specifically, the subtheme titled "Favourable Intentions" investigates the participants' optimistic views and intentions with respect to the incorporation of virtual reality technology into the world of online purchasing. The majority of participants, when asked the question, “In what ways would VR influence your decision-making process while shopping online?” expressed a keen interest in the transformative potential of virtual reality (VR) technology within the realm of E-commerce. Their purchase behaviours are substantially influenced by the extensive product evaluation, immersive interactions, and educated decision-making facilitated by VR. Participants emphasised the advantage of being able to realistically see things in a realistic setting, which increased their confidence in making selections and reduced concerns about product suitability and return policies. Furthermore, several participants expressed a desire to allocate additional time to participate in VR shopping experiences. They showed a greater inclination to make purchases as a result of the improved clarity and engagement provided by VR technology. In general, most participants saw virtual reality (VR) as a promising technology that might potentially revolutionise their online purchasing experiences. They expressed optimism about its ability to address the challenges of adopting e-commerce in South Africa. All of the participants expressed their favourable views and intentions about the use of virtual reality as a method of improving their overall experiences using online shopping.

Participant 11 (P11) expressed, *"I'm in favour. My online shopping habits are often impacted by concerns about product fit and return policies. This lack of clarity makes me hesitant to commit to buying, ultimately influencing my purchasing decisions."*

Participant 8 (P8) showed*, "It will influence my decision-making process because I'll end up buying more stuff than I should have and staying longer on the on the, on the shopping than I would normally do."*

Several other individuals provided a viewpoint that differed from the prevailing opinion. P3 mentioned, *"The seductive ease of browsing from the comfort of home certainly has its allure, but it doesn't significantly impact my shopping habits. My purchases are driven by immediate needs, and once I've identified the desired item, I'm prompt in making the purchase and exiting the VR space. The convenience factor, while attractive to many, doesn't hold the same power over me."*

The participant recognised the practicality of virtual reality (VR) shopping but said that it did not significantly impact their buying habits. The individuals expressed a strong inclination towards making purchases that fulfil their immediate demands. They indicated that once they have discovered a desired item, they rapidly continue with the purchase without spending much time in the virtual reality area. This approach emphasises the range of customer attitudes towards VR technology and emphasises the need to consider individual preferences and behaviours when implementing new E-commerce technologies. P10 deviated from the prevailing viewpoint. While many have emphasised the advantages of virtual reality (VR) in improving the shopping experience, P10 has instead expressed their worries about product fit and return procedures. They argue that these apprehensions have a substantial impact on their choices to make purchases online. The positive intentions that participants have towards the incorporation of virtual reality technology into the retail scene are highlighted by Kim's (2022) investigation of the function that virtual reality plays in enhancing e-commerce after COVID-19. A communal enthusiasm to use virtual reality for the purpose of enhancing the experience of online shopping is highlighted by the literature, which aligns with the participants' optimism.

4.3.4 Theme 4: Actual Use

A thematic analysis of interview answers revealed a range of insights on the perspectives and attitudes of South African customers towards the integration of Virtual Reality (VR) in E-

commerce. One of the topics that came up was the investigation of Actual Use, which included detailed subthemes that revealed insights into customers' behavioural tendencies and concerns. Product Categories and usability, focusing on the behavioural ease of use, surfaced as a pivotal aspect, reflecting how consumers navigated through different product categories within the VR e-commerce landscape. Another significant subtheme revolved around concerns regarding Product Fit and Return Policies, delving into the practical implications of VR utilization in actual use scenarios. Furthermore, the Influence on Willingness to Use emerged as a key consideration, encapsulating the multifaceted dynamics influencing consumers' readiness to embrace VR technology within the realm of E-commerce. The theme and subthemes were identified via interviews that focused on assessing the practicality and user-friendliness of VR technology. The interviews were conducted within the context of exploring the obstacles to its adoption in the South African E-commerce industry.

Table 4.5: Subthemes of Theme 4: Actual Use

Subthemes
Product Categories and usability (behavioural ease of use)
Concerns about Product Fit and Return Policies (Actual Use)
Influence on Willingness to Use

Table 4-4 outlines the subthemes associated with Theme 4 – Actual Use.

4.3.4.1 Subtheme: Product Categories and Usability (Behavioural Ease of use)

The subtheme under "Product Categories" investigates the feelings that participants have on the applicability and efficiency of virtual reality technology in relation to various product categories. The majority of participants, when asked the question, "Can you imagine any usability issues users would encounter with a VR-based shopping experience?" expressed concerns about various barriers hindering the adoption of virtual reality (VR) in E-commerce within the South African context. Primary among these concerns were limits in infrastructure, including sluggish

internet speeds and communication problems, which were worsened by obstacles such as load shedding. A considerable number of participants emphasised the challenges associated with navigating virtual reality (VR) interfaces, especially for those with poor technical proficiency. This, in turn, led to doubts over its usefulness. Moreover, there were concerns over the precision of virtual depictions of merchandise, particularly regarding suitability and excellence, resulting in doubts about the dependability of virtual reality for e-commerce.

Participants acknowledged the potential of virtual reality (VR) to enhance the shopping experience by providing immersive interactions. However, they emphasised the need to improve accessibility and user-friendly interfaces to overcome these obstacles. In general, the participants' replies showed a combination of hopeful anticipation and practical concerns about the practicality and applicability of virtual reality (VR) technology in the South African E-commerce industry. Participants expressed concerns about the applicability and efficiency of VR technology across different product categories, suggesting that the usability of VR might vary depending on the nature of the product being advertised or sold. This observation aligns with the behavioural ease of use aspect, as users' perceptions of technology usability are influenced by how well it fits their needs and tasks. Participants shared insights on how virtual reality could be more suited for some kinds of items than others.

Participant 9 (P9) stated, *"I suspect you may run into this type of issue where the VR experience is different from the real experience, especially if it's an e-commerce. Let's say you're selling a car, right? And then, the VR makes it look and feel good."*

Participant 6 (P6) showed*, "I haven't faced any significant difficulties with using VR. While there's always a learning curve involved with any new technology, resources like manuals and online tutorials, such as YouTube videos, can be helpful in overcoming initial hurdles. While the immersive experience of VR is exciting, connectivity can sometimes be a hurdle. However, it's important to differentiate between VR-specific connection challenges and limitations inherent to the user's device and internet infrastructure. For example, ensuring a stable internet connection on the user's computer or other device is crucial for a smooth VR experience."*

There were other people whose perspectives differed from the prevailing opinions voiced by the majority. P2, for example, stressed the need for precise product representations in VR E-commerce, drawing attention to possible disparities between virtual portrayals and real-world

encounters. Their worries mostly revolved around the fit and quality of the product, emphasising the need for VR platforms to have advanced scanning capabilities to address these problems. In addition, P10 highlighted concerns regarding the practicality of VR adoption among older age groups, highlighting certain difficulties associated with technological competence and user-friendliness. They emphasised the significance of considering a wide range of user demographics when designing and implementing VR E-commerce systems in order to guarantee inclusiveness and accessibility. The perspectives of these participants differed from the main focus on infrastructure limitations and usability challenges. Instead, they provided distinct insights into specific concerns related to the accuracy of product representation and demographic factors in the use of VR technology for E-commerce in South Africa.

Within the context of examining the possible acceptance and integration of virtual reality technology, Mon's (2020) prediction study of virtual reality (VR) adoption on e-commerce platforms highlights the relevance of taking into consideration a variety of product categories. This is consistent with the observations made by the participants, which highlights the need to evaluate the applicability of virtual reality (VR) within certain product settings in order to maximise its efficiency in improving the overall experience of online shopping. The subtheme sheds light on the delicate concerns surrounding the implementation of virtual reality technology across a variety of product categories within the area of e-commerce by triangulating the viewpoints of the participants with the literature that is already available.

4.3.4.2 Subtheme: Concerns about Product Fit and Return Policies (Actual Use)

The subtheme under "Concerns about Product Fit and Return Policies" dives into the participants' concerns with online shopping, with a particular emphasis on the anxieties that are associated with product fit and the regulations that regulate product returns. The majority of participants, when asked the question, "In what ways would VR influence your decision-making process while shopping online?" expressed optimism regarding the integration of virtual reality (VR) in E-commerce, highlighting its potential to enhance the shopping experience by providing detailed product information and an immersive environment for decision-making. They observed that virtual reality (VR) has the potential to reduce uncertainty related to conventional online purchasing by enabling users to engage with items and make better-informed decisions virtually. Participants highlighted the pleasure and lucidity that virtual reality (VR) provides to the shopping experience, which has a favourable impact on their decision-making. Nevertheless, participants

often expressed worries over the suitability of the product and the regulations for returning items, which sometimes caused them to hesitate before finalising their purchases. Overall, most participants held the belief that virtual reality (VR) will have a substantial impact on the future of online shopping by providing a more immersive and informative experience. Participants provide insightful perspectives on the ways in which ambiguities about the fit of items and the conditions of return policies play a vital role in moulding their selections when they engage in online shopping.

Participant 11 (P11) stated, *"My online shopping habits are often impacted by concerns about product fit and return policies. This lack of clarity makes me hesitant to commit to buying, ultimately influencing my purchasing decisions."*

Participant 8 (P8) mentioned*, "So people who have like less technical experience with technology itself will find it very difficult for usability and navigating through the VR. there's moving around and not knowing what to select , that would be the issue navigating around it because of their technical skills that are less on the technical look from the technology side."*

P3 had a divergent perspective in contrast to the prevailing majority. They said that while the ease of virtual reality (VR) in online buying is appealing, it does not have a substantial influence on their purchasing behaviour. P3 stated, *"The seductive ease of browsing from the comfort of home certainly has its allure, but it doesn't significantly impact my shopping habits. My purchases are driven by immediate needs, and once I've identified the desired item, I'm prompt in making the purchase and exiting the VR space. The convenience factor, while attractive to many, doesn't hold the same power over me."* P3 differed from others in their perspective on VR's impact on decision-making. They emphasised that their purchase choices were mostly influenced by urgent requirements rather than the immersive nature of VR technology.

In addition to P3, P7 also offered a unique viewpoint in contrast to the majority. Although some participants showed optimism over the capacity of virtual reality (VR) to improve decision-making, P7 voiced doubt about whether VR would influence them to buy goods they would not have otherwise explored. Participant 7's perspective differs from the majority due to their doubt about the long-term effects of virtual reality (VR) on their purchasing choices. This suggests that P7 takes a more cautious stance towards the possible impact of VR technology in the field of E-commerce. The investigation conducted by Martínez-Navarro (2019) into the effect of virtual

reality on e-commerce agrees with the perspectives of the participants. The study highlights the fact that external factors may have a considerable impact on the desire of users to adopt and interact with virtual reality experiences. The body of research that has been conducted lends credence to the idea that factors concerning product compatibility and return policies are two of the principal factors that influence consumers' readiness to accept virtual reality in the context of online purchasing. The triangulation of the viewpoints of the participants with the research that has already been conducted highlights the significance of addressing external factors in order to improve user acceptability and adoption of virtual reality technologies within the context of the e-commerce environment.

4.3.4.3 Subtheme: Influence on Willingness to Use

The subtheme titled "Influence on Willingness to Use" investigates the views of the participants about the ways in which external factors, notably concerns regarding product fit and return policies, influence their readiness to accept and make use of virtual reality (VR) in the context of online purchasing. The majority of participants, when asked the question, "How would VR influence your willingness or inclination to use this technology for future online purchases?" expressed a strong inclination towards adopting virtual reality (VR) technology in E-commerce, citing factors such as convenience, improved shopping experiences, and the ability to access a wide range of products from the comfort of their homes as primary motivators. The individuals stressed the significance of authentic virtual encounters in aiding confident buying choices and expressed their readiness to use virtual reality platforms provided they fulfilled their expectations consistently. In addition, participants saw that organisations using immersive technologies such as virtual reality (VR) gained their confidence and were more inclined to attract their purchases in comparison to those depending exclusively on static visuals. On the whole, most participants had favourable views about the incorporation of virtual reality (VR) in E-commerce, showing a willingness to accept and make use of its potential advantages. The participants provide insightful perspectives on the ways in which these external elements impact their views and receptivity towards the use of virtual reality technology for online shopping environments.

Participant 8 (P8) mentioned, *"I think it would influence my willingness because of the good experience I have with VR shopping. I would definitely use it for future purchases."*

Participant 10 (P10) showed, *"It will obviously influence to make better decision because I will be having a clear view of products, that can help me to make quick decisions."*

P3 had a divergent perspective in opposition to the prevailing majority. They expressed that while the convenience of VR in online shopping is attractive, it doesn't significantly impact their shopping habits. P3 stated, *"The seductive ease of browsing from the comfort of home certainly has its allure, but it doesn't significantly impact my shopping habits. My purchases are driven by immediate needs, and once I've identified the desired item, I'm prompt in making the purchase and exiting the VR space. The convenience factor, while attractive to many, doesn't hold the same power over me."*

Contrary to others who saw VR as a potentially revolutionary tool in decision-making, P3 said that their purchase choices were mostly influenced by urgent requirements rather than the immersive experience provided by VR technology. In addition to P3, P7 also offered a unique viewpoint in contrast to the majority. Although some participants showed excitement over the potential of virtual reality (VR) to improve decision-making, participant 7 expressed scepticism about whether VR would influence them to buy goods they would not have otherwise explored. P7's perspective diverges from the majority due to their doubt about the long-term effects of VR on their purchasing choices. This suggests a more cautious attitude towards the possible impact of VR technology in the field of E-commerce.

The research conducted by Mohammed (2021) on the adoption of e-commerce platforms, which is based on the theory of impulsive purchasing behaviour, highlights the influence that concerns regarding product fit and return policies have on the decision-making process of online buyers. The literature aligns with the concerns expressed by the participants, highlighting the need to provide return policies that are open and easy to understand, as well as providing comprehensive information on product compatibility, in order to ease customer worries and improve the overall experience of purchasing online. When the views of the participants are triangulated with the findings of previous research, it draws attention to the significant significance that these elements play in determining the attitudes and behaviours of customers in the context of the e-commerce environment.

4.4 Conclusion

This chapter's objective was to provide the findings and carry out an analysis of the information that was obtained over the course of the project. Considering that the research was conducted using a qualitative approach, the method of thematic data analysis was used in the investigation. *NVivo*© was used for the aim of data analysis due to the fact that it facilitated the assessment of \data more straightforwardly.

CHAPTER 5 DISCUSSION AND INTERPRETATION OF FINDINGS

5.1 Introduction

The incorporation of virtual reality technology with online buying provides a potential opportunity in the e-commerce industry, providing customers with engaging and interactive purchasing experiences. This chapter presents the results and observations obtained from a thematic analysis of participants' viewpoints about the use of virtual reality technology in online purchasing. This chapter aims to provide valuable insights into the potential of VR technology to enhance the online shopping experience. It explores themes such as perceived ease of use, comparison with physical shopping, economic barriers to adoption, influence on decision-making, and actual use affecting user willingness.

5.2 Findings

The thematic analysis of participants' viewpoints on the incorporation of virtual reality technology into online purchasing revealed significant observations on the perceived advantages and difficulties linked to this novel method. Initially, the participants conveyed a significantly optimistic perspective about the simplicity of acquiring knowledge and using virtual reality technology for online buying, particularly when supplemented with sufficient instruction. This opinion aligns with previous research, as shown by Bhutto et al. (2023) and Hsiao and Yang (2011), who emphasise the crucial importance of user training and the perceived simplicity of usage in promoting the acceptance of VR technology. This conclusion emphasises the need to offer extensive training to enhance users' comfort and competence in navigating virtual reality retail experiences by matching participants' perspectives with known research.

In addition, the participants highlighted the potential benefits of virtual reality in providing a more engaging and realistic buying experience compared to traditional online techniques. This is consistent with the research conducted by Van Zyl (2020), who investigates the disruptive capabilities of virtual reality in transforming the retail sector and promoting the importance of smooth transitions from traditional brick-and-mortar shopping to virtual shopping experiences. Participants valued the distinctive capability of VR to provide distant investigation and exploration of items, which resulted in a more profound degree of involvement and connection. Despite

acknowledging the advantages of VR, there were still worries about possible difficulties, including disorientation and technical problems. It is important to pay close attention to ensure that users feel comfortable and confident throughout VR shopping experiences.

Moreover, the participants made analogies between the virtual reality (VR) purchasing experience and conventional physical shopping, emphasising the unique benefits of VR in overcoming geographical limitations and enabling remote examination of products. Mon (2020) and (Mankhili, 2023) have both discussed the revolutionary potential of virtual reality (VR) in increasing accessibility to items and improving the entire shopping experience. Participants acknowledged the distinct advantages of virtual reality (VR) but also noted the need to resolve problems such as disorientation and technical concerns to guarantee a smooth and pleasurable VR shopping experience.

Furthermore, the participants emphasised that economic factors, namely the cost and availability of VR headsets, are major obstacles that impede the mainstream integration of VR technology in online purchasing. This discovery is consistent with the investigations carried out by Mon (2020), Kim (2022), and (Mankhili, 2023), which highlight the need to tackle problems related to pricing and availability to promote the smooth incorporation of virtual reality into e-commerce platforms. Participants in the study confirmed the ideas presented in previous research, revealing the practical difficulties that come with adopting VR technology. This highlights a clear difference between the theoretical potential of VR and its actual use in the real world.

In addition, attendees expressed worries about the sluggish implementation of virtual reality technology by prominent e-commerce platforms, which is hindering its widespread acceptance. The disparity between research forecasts and actual implementation highlights the difficulties involved in integrating innovative technology into existing corporate frameworks. Kim (2022) and van Wyk et al. (2024) have emphasised the need to overcome institutional hurdles and promote widespread adoption of VR technology to harness its transformational capabilities in the e-commerce business fully. By recognising these obstacles, participants provide vital perspectives on the complex process of VR adoption and the structural modifications needed to overcome current limitations.

The participants examined the impact of virtual reality on the decision-making processes involved in online buying. They observed that VR could boost customer confidence and enable more well-

informed purchase choices. This discovery is consistent with the findings of Mon's (2020) study, which predicts that virtual reality would have a beneficial effect on decision-making in the field of e-commerce. VR technology could enhance customer product knowledge and confidence by offering immersive and realistic shopping experiences, hence influencing their purchase behaviours. Moreover, the participants expressed their eagerness and excitement to use virtual reality technology in their next online shopping experiences. They emphasised its potential to completely transform the consumer purchasing process and reinvent interactions with e-commerce platforms. This is consistent with the positive perspective offered in current research, indicating an increasing acknowledgement of the revolutionary capacity of virtual reality in altering the future of online shopping.

Participants emphasised that external factors, such as product suitability and return policies, played a crucial role in their willingness to use VR technology for online shopping. This aligns with the findings derived from Martínez-Navarro's (2019) study, which highlights the substantial influence of actual use on the acceptability and adoption of virtual reality technology by users. Through the process of triangulating participant views with current literature, it becomes clear that it is crucial to address these external problems, as well as improve product categories and usability, to integrate virtual reality into online shopping environments successfully. The similarity between participant feedback and academic research highlights the intricate interaction between user perceptions and environmental variables in influencing the adoption trajectory of virtual reality technology. According to Martínez-Navarro (2019), user acceptability of virtual reality depends not only on how useful and easy to use it is regarded to be but also on other criteria, such as how well it fits the user's needs and the rules around returns. Therefore, it is crucial to adopt a comprehensive strategy to effectively address these issues and promote consumer trust and confidence in virtual reality-based shopping experiences.

Furthermore, the observations made by the participants emphasise the need to continuously improve and enhance virtual reality technology to overcome current obstacles and limitations. E-commerce platforms may foster increased consumer trust and allow seamless transitions to VR-enabled buying experiences by recognising and actively resolving issues related to product fit and return policies. Moreover, the recognition of these external factors highlights the ever-changing character of customer preferences and emphasises the need for continuous adjustment and innovation within the e-commerce industry.

Table 4.1 (Section 4.3) set out the relationships between the main research question, the sub-questions and the associated objectives. The main research question (MRQ) "What are the barriers to the adoption of virtual reality in e-commerce in South Africa?" was answered through various insights provided by participants in the process of answering SQ1 and SQ2. Based on the thematic analysis of participants' viewpoints on incorporating virtual reality technology into online purchasing, the study addressed the barriers and perceptions of VR adoption in e-commerce in South Africa. They highlighted several obstacles, such as technical difficulties and disorientation, which can hinder user comfort and confidence during VR shopping experiences. Additionally, participants pointed out significant economic factors, including the cost and availability of VR headsets, as major barriers impeding the mainstream integration of VR technology into online purchasing. These observations were consistent with the research conducted by Van Zyl (2020) and Kim (2022), emphasizing the need to address pricing and accessibility issues to promote the smooth incorporation of VR into e-commerce platforms. Moreover, concerns about the sluggish implementation of VR by prominent e-commerce platforms were also discussed, revealing institutional hurdles that must be overcome to achieve widespread adoption.

SQ1 How do South African consumers perceive the ease of use of virtual reality in e-commerce?

The first sub-question (SQ1), given as " How do South African consumers perceive the ease of use of virtual reality in e-commerce?" was addressed through participants' perspectives on the simplicity of acquiring knowledge and using VR technology for online shopping, particularly when supplemented with sufficient instruction. This aligns with previous research by Bhutto et al. (2023) and Hsiao and Yang (2011), which highlighted the crucial importance of user training and perceived ease of use in promoting the acceptance of VR technology. Participants emphasise d the need for extensive training to enhance users' comfort and competence in navigating VR retail experiences, thus highlighting the significance of user-friendliness in the successful adoption of VR technology.

SQ2: How do South African consumers perceive the usefulness of, attitude to and actual use of virtual reality in e-commerce?

The second sub-question (SQ2) " How do South African consumers perceive the usefulness of, attitude to and actual use of virtual reality in e-commerce?" was answered by participants' recognition of VR's potential to provide a more engaging and realistic buying experience compared to traditional online methods. They valued the distinctive capability of VR to facilitate remote investigation and exploration of items, which resulted in a more profound degree of involvement and connection. This perception aligns with studies by Kim (2022) and Mon (2020), who explored the transformative potential of VR in the retail sector. Furthermore, participants noted that VR could boost customer confidence and enable more well-informed purchase decisions by offering immersive and realistic shopping experiences, thereby positively influencing their buying behaviours.

5.3 Insights

The survey participants generally conveyed a favourable opinion of virtual reality technology in relation to its potential use in online shopping. Their emphasis was on the simplicity of acquiring and using virtual reality instruments, particularly with the provision of sufficient training. Consumers' favourable attitude indicates their willingness to adopt emerging technologies that provide engaging and lifelike purchasing experiences. The participants' inclination to embrace VR technology suggests a possible transition towards more technologically sophisticated purchasing techniques in the future, motivated by a desire for improved ease and involvement.

Participants also contrasted the experience of virtual reality buying with conventional physical shopping techniques, highlighting many distinct benefits provided by VR technology. An important benefit that was emphasised is the capability to inspect and investigate things remotely inside a virtual setting. This feature enables customers to examine things in detail without the need to be physically present in a store, providing a degree of ease and accessibility that is not often seen in conventional shopping experiences. Nevertheless, participants also voiced apprehensions about possible obstacles linked to VR buying, such as disorientation and technological difficulties. These worries highlight the need for ongoing enhancement and advancement in VR technology to guarantee a smooth and user-friendly buying experience.

Although VR technology in online shopping is believed to have advantages, economic constraints have proven to be major obstacles to its widespread use. Participants noted that the prohibitive cost and restricted accessibility of VR headsets are major obstacles that hinder the wider use of

VR technology in e-commerce platforms. The exorbitant price of virtual reality equipment and its restricted availability provide obstacles for many users, especially those with constrained financial resources or residing in areas with inadequate technological infrastructure. To promote the integration of VR into e-commerce platforms and extend its user base, it is crucial to address these economic obstacles. Implementing cost-reduction strategies, such as providing inexpensive virtual reality headset alternatives or establishing rental programmes, might effectively address economic obstacles and promote wider acceptance of VR technology in the realm of online commerce.

The study discovered that the captivating quality of virtual reality encounters had a significant impact on how participants made decisions when purchasing online. VR technology could enhance consumer decision-making by offering realistic and comprehensive product views in a virtual environment, enabling users to make more educated and confident purchase choices. Participants saw that the capacity to examine and engage with things in a virtual environment visually might assist them in more accurately evaluating their appropriateness and excellence prior to making a purchase. These findings indicate that the usage of virtual reality in online buying may be motivated by its ability to influence decision-making significantly. Users are likely to use this technology to improve their overall purchasing experience. Virtual reality has the potential to revolutionise customer engagement with e-commerce platforms by providing a more immersive and interactive retail environment. This may lead to more pleasant and fulfilling buying experiences.

Participants highlighted external issues, such as apprehensions over product compatibility and refund procedures, as pivotal factors impacting their inclination to embrace virtual reality technology for online buying. These concerns pertain to larger difficulties with the trust and confidence that users have in purchasing experiences that are facilitated by virtual reality. To promote consumer acceptability and adoption of VR technology in e-commerce platforms, it is crucial to address these challenges. Enhancing consumer trust and confidence in VR-enabled retail environments will require improving product categories and usability to provide a smooth and intuitive buying experience. To promote wider acceptance of VR technology in online purchasing, e-commerce platforms may focus on optimising user experience by addressing external factors and enhancing user engagement and pleasure.

2.5 Challenges faced by South African Consumers

South Africa is currently faced with a significant challenge in the form of elevated rates of unemployment, particularly prevalent among the younger population. Therefore, a significant segment of the populace experiences a constraint on their ability to make purchases, thereby impeding their access to various commodities and services (Sibindi, 2022). Moreover, the presence of income inequality serves to exacerbate the situation, thereby perpetuating the widening disparity between individuals of higher socioeconomic status and those who are less privileged (Komito, 2019). These issues exert a significant impact on consumer decision-making, preferences, and the broader economic landscape. South African consumers face ongoing challenges due to the persistent rise in inflation and the escalating cost of living (Sobré-Denton, 2016). With the increase in prices, consumers are facing difficulties in upholding their standard of living, resulting in alterations in their spending habits and a heightened emphasis on acquiring essential goods. According to (Sibindi, 2022), this phenomenon has the potential to exert adverse effects on both economic growth and consumer confidence. South Africa encounters recurrent energy crises and water scarcity, exerting a direct impact on the daily lives of consumers (Mohammed, 2021). The occurrence of electricity blackouts and the restricted availability of clean water have a detrimental impact on productivity levels and contribute to an escalation in the cost of living, particularly for households that are more susceptible to adverse effects. The challenges are expected to exert an influence on consumer behaviour and consumption patterns (Rolls, 2016).

The provision of high-quality healthcare services poses a considerable obstacle for numerous consumers in South Africa, particularly those residing in rural and underserved regions. The absence of readily available healthcare alternatives can result in heightened healthcare-related expenditures, thereby affecting the financial stability of consumers and exerting an influence on their consumption choices. The issue of the digital divide continues to be a significant and urgent problem in South Africa, as a considerable number of individuals in the country still face factors in terms of internet access and proficiency in digital literacy (Komito, 2019). The presence of limited internet connectivity poses a significant barrier to accessing online services, engaging in e-commerce activities, and utilising digital payment methods, thereby hindering consumers' complete involvement in the digital economy. South African consumers are consistently confronted with the peril of fraudulent activities and deceptive schemes, with a particular

emphasis on online transactions (Komito, 2019). The erosion of consumer trust poses a significant obstacle to the expansion of e-commerce and the widespread adoption of digital payment methods.

5.4 Chapter Summary

The chapter summary provides a concise overview of the main discoveries and understandings obtained from the theme analysis of participants' viewpoints about the incorporation of virtual reality technology into online purchasing. The participants generally expressed a favourable impression of virtual reality technology, emphasising its user-friendly nature and its ability to provide engaging shopping experiences. Nevertheless, apprehensions about difficulties such as confusion and technological problems highlight the need for more improvement in virtual reality technology. In addition, the participants made a comparison between VR purchasing and real shopping, highlighting the distinct benefits of VR in facilitating distant product inspection and exploration. Obstacles to mass adoption, such as the exorbitant price and restricted accessibility of VR headsets, have been identified as major economic impediments. In addition, the participants observed the impact of virtual reality on the decision-making processes involved in online buying. They proposed that immersive VR experiences might potentially result in more knowledgeable and self-assured purchase choices. Nevertheless, the significance of external elements, such as the suitability of the product and the rules regarding returns, in affecting consumer acceptance of VR technology was recognised. The chapter primarily focuses on the capacity of VR technology to improve the online buying experience while also acknowledging the importance of addressing usability, cost, and consumer trust concerns to integrate it into e-commerce platforms successfully.

CHAPTER 6 CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter contains the conclusions and recommendations of the study. The chapter begins with a discussion of the results from the literature review and primary research, followed by conclusions, recommendations, and prospective future research subjects. This study aims to explore the barriers to the adoption of virtual reality in e-commerce in South Africa. The objectives of the study were:

- **O1**: To understand how consumers perceive the usefulness of virtual reality in e-commerce in South Africa
- **O2**: To determine whether consumers perceive virtual reality as easy to use in e-commerce in South Africa

6.2 Study findings

6.2.1 Findings from the Literature Review

Several studies have shown that the use of e-commerce has had a substantial impact on promoting economic growth in South Africa. This is mainly due to its ability to enable small and medium-sized firms (SMEs) to access a wide market. According to the analysis by Martínez-Navarro (2019:480), released in 2018, the expansion of e-commerce has had a substantial impact on job creation and the development of existing businesses. However, other scholars argue that the growth of e-commerce may lead to the loss of job prospects in traditional retail sectors. Lixandroiu's (2015:55) study results suggest that the rise of e-commerce not only brings new job possibilities but also presents a substantial risk to the traditional retail sector, perhaps leading to a decline in overall employment. The emergence of e-commerce has provided South African enterprises with new opportunities to enter global markets. In research done by Mohammed (2021:05), it was discovered that e-commerce platforms have greatly facilitated the global growth of local businesses. South Africa is now grappling with a substantial predicament in the shape of elevated levels of unemployment, especially prominent among the youth demographic.

Hence, a substantial portion of the population has a limitation in their purchasing power, which hinders their access to a wide range of goods and services (Sibindi, 2022). Furthermore, the existence of income inequality worsens the problem, therefore maintaining the growing gap between persons with better socioeconomic standing and those who are less fortunate (Komito, 2019:1080). These challenges have a substantial influence on consumer decision-making, preferences, and the overall economic environment. South African consumers are continuously confronted with difficulties caused by the continuing increase in inflation and the growing expenses associated with daily life (Sobré-Denton, 2016). Due to rising costs, consumers are struggling to maintain their level of life, leading to changes in their spending patterns and a greater focus on obtaining necessary products. As stated by Sibindi (2022), this occurrence can impose negative impacts on both the expansion of the economy and the trust of consumers. South Africa has frequent energy crises and water shortages, which directly affect the everyday lives of consumers (Mohammed, 2021:05).

The fast growth of Virtual Reality technology has caused a meaningful change in the way we think and operate. This technology has unlocked new and transformative opportunities in important fields, including education, healthcare, entertainment, and training. As a result of this transformative journey, there has been a shift in the way we think, which requires a thorough and analytical examination of virtual reality applications to uncover the many benefits associated with them. Studies undertaken within the subject of education, such as Grewe's (2023) research, have shown the positive impacts of virtual reality-based learning. This progressive method not only enhances students' capacity to grasp complex subjects but also heightens their degree of involvement and their capacity to retain knowledge. Nevertheless, Mon's (2020:178) cautious perspective tempers enthusiasm, emphasising the potential budgetary limitations associated with the widespread use of virtual reality in educational environments.

6.2.2 Findings from the Primary Research

The participants demonstrated a collective and resolute conviction that virtual reality will unquestionably influence the future terrain of internet business. Their unwaveringly positive perspective on the revolutionary capacity of VR in the domain of online buying closely aligns with their expectation of a significant and lasting influence on the course of e-commerce. Participants placed significant importance on the perceived benefits of using virtual reality to influence decision-making in online purchases. The users' enthusiastic and eager reactions towards

adopting VR for online purchasing highlight their expectation of favourable results, emphasising the potential revolutionary impact of this technology on e-commerce platforms. The participants shared excitement and emphasised a common willingness to use virtual reality (VR) to improve the entire online purchasing experience. The collective emotion of these individuals perfectly matches their optimistic viewpoints, indicating a mutual conviction in the beneficial consequences of incorporating virtual reality into the structure of online business. However, despite their excitement, participants also voiced specific worries regarding the integration of virtual reality technology into several product categories within the e-commerce industry. Their observations highlighted the significance of carefully assessing the use of virtual reality in certain product scenarios to guarantee maximum efficacy in improving the entire online shopping experience.

The participants expressed a strong need for clear and understandable return procedures, together with extensive information on product compatibility, in response to the sensitive issues addressed. According to participants, these variables were crucial in reducing consumer concerns and influencing the entire online shopping experience. The participants' perspectives, when combined with their experiences and emotions, emphasised the crucial importance of these external influences. Their shared position agrees with the growing trend that issues such as product compatibility and return policies have a significant impact on customers' willingness to adopt virtual reality while making online purchases. The integration of participants' perspectives with their practical experiences reinforces the overarching belief that considering these external elements is crucial for promoting user acceptance and the effective implementation of virtual reality (VR) technology in the ever-changing field of e-commerce. The participants' stated viewpoints provide useful insights into the complex processes that influence the changing connection between customers and modern technology in the online buying realm.

6.3 Research Contribution

The findings of this study have led to the development of a tailored and comprehensive modified Technology Acceptance Model (TAM) specifically designed for the adoption of virtual reality (VR) technology in online shopping. Unlike the generic TAM model, which primarily focuses on perceived usefulness and perceived ease of use as the main determinants of technology adoption, this modified model incorporates additional dimensions that are particularly relevant to VR adoption. A more nuanced understanding of the intricate decision-making process involved in adopting VR technology for online shopping is provided by this modified TAM model, which

incorporates perceived enjoyment, social influence, immersion and realism, and other crucial factors influencing users' attitudes and intentions towards VR adoption. This modification highlights the study's contribution to expanding theoretical frameworks customized to technical developments and their adoption patterns, as well as the unique problems and possibilities given by VR technology in the context of e-commerce.

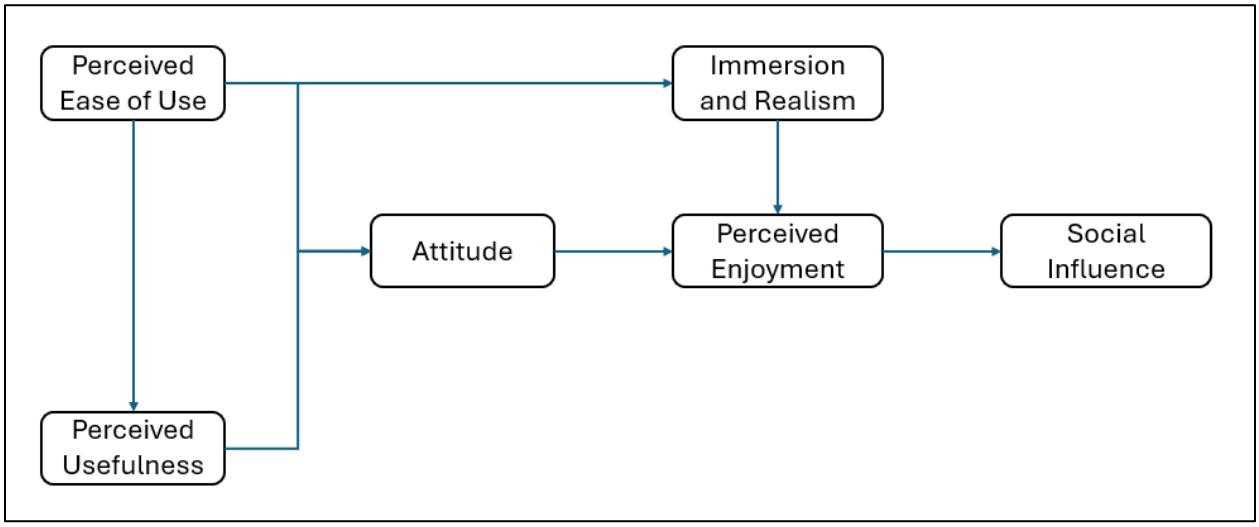

Figure 6.1: Virtual Reality Adoption Model

Figure 6-1 Presents the virtual reality adoption model relating to this study. It includes the following items:

1. **Perceived Ease of Use (PEOU):**
    - Participants acknowledge the importance of sufficient training and instruction for effectively using VR in online shopping.
    - Concerns about disorientation and technical difficulties highlight the need for continuous enhancement and advancement in VR technology.
2. **Perceived Usefulness (PU):**
    - Virtual reality (VR) technology is thought to be helpful for improving decision-making processes, enabling remote product exploration, and offering captivating and realistic shopping experiences.

- Participants like how virtual reality (VR) may enhance their entire shopping experience, confidence, and product knowledge.

3. Attitude

    - Most participants believe VR will revolutionize online shopping, citing improved experiences and increased sales.
    - While some worry about user adoption, the overall sentiment is that VR is the future of e-commerce.
    - There is excitement for VR shopping due to its convenience, immersive experiences, and ability to make informed decisions.
    - Participants expressed a positive outlook on VR's potential to improve online shopping experiences.

4. **Immersion and Realism (IR):**

    - Participants value the immersive and realistic qualities of VR technology in providing a lifelike shopping experience.
    - Immersion and realism contribute to users' perceived engagement, enjoyment, and overall satisfaction with VR-enabled buying experiences.

5. **Perceived Enjoyment (PE):**

    - Participants express enjoyment and excitement about the immersive and interactive nature of VR-enabled shopping experiences.
    - The enjoyment derived from using VR technology may positively influence users' attitudes and intentions towards its adoption in online shopping.

6. **Social Influence (SI):**

    - The perceptions and opinions of peers, family, and social networks may influence individuals' decisions to adopt VR technology in online shopping.

- Positive social influence, such as recommendations from trusted sources or social validation, may enhance users' attitudes and intentions towards VR adoption.

Modified TAM Model for Virtual Reality (VR) Adoption in Online Shopping:

PEOU → PU (Perceived Ease of Use to Perceived Usefulness):

Perceived Ease of Use (PEOU) influences users' perceptions of the Perceived Usefulness (PU) of VR technology in online shopping. Suppose users find VR technology easy to use. In that case, they are more likely to perceive it as useful for their shopping needs, as they can navigate and interact with the technology effortlessly. Higher ease of use may lead to a positive perception of usefulness, as users believe that VR technology can facilitate their online shopping experience effectively.

PEOU → ATT (Perceived Ease of Use to Attitude):

Perceived Ease of Use (PEOU) influences users' Attitude (ATT) towards VR technology. If users find VR technology easy to use, they are more likely to develop a positive attitude towards its adoption, as they perceive it as accessible and user-friendly. Higher ease of use may lead to a more favourable attitude towards VR technology, as users feel more comfortable and confident in engaging with it.

PU → ATT (Perceived Usefulness to Attitude):

Perceived Usefulness (PU) influences users' Attitude (ATT) towards VR technology. Suppose users perceive VR technology as useful for their online shopping needs. In that case, they are more likely to develop a positive attitude towards its adoption, as they see value in incorporating it into their shopping routines. Higher perceived usefulness may lead to a more favourable attitude towards VR technology, as users recognize its potential to enhance their shopping experience.

PEOU → IR (Perceived Ease of Use to Immersion and Realism):

Perceived Ease of Use (PEOU) influences users' perceptions of Immersion and Realism (IR) in VR-enabled shopping experiences. When users perceive VR technology as user-friendly, they are more likely to interact with it comfortably and successfully, fully immersing themselves in the

virtual world. User-friendliness means the system is intuitive and easy to navigate, with clear instructions and minimal technical jargon, accommodating users of all technical backgrounds. An appealing design, both visually and ergonomically, significantly enhances user comfort and engagement, contributing to a more enjoyable and immersive experience. Furthermore, simplicity in design—characterized by a streamlined interface and the elimination of unnecessary elements—ensures that users can focus on the content rather than struggling with the system's operation. Combining these elements, a user-friendly, visually appealing, and simple VR system fosters a more accessible, engaging, and immersive experience, leading to higher user satisfaction and successful interaction. Increased usability might improve users' capacity to engage with virtual reality interfaces and browse virtual storefronts, resulting in a higher level of immersion. Therefore, a positive perception of ease of use contributes to users' overall satisfaction with the immersion and realism of VR-enabled shopping experiences.

PU → ATT → PE → SI (Perceived Usefulness to Attitude to Perceived Enjoyment to Social Influence):

Users' Attitude (ATT) toward virtual reality (VR) technology is influenced by their Perceived Usefulness (PU), which is determined by how useful VR technology is to them for their online purchasing requirements. When consumers accept virtual reality (VR) with passion and positivism, their Perceived Enjoyment (PE) of VR-enabled retail experiences is improved. Users' views of Social Influence (SI) are favourably impacted by higher reported pleasure from VR technology because they are more likely to share their good experiences with friends and family, which promotes VR adoption on a positive social level.

IR → PE (Immersion and Realism to Perceived Enjoyment):

Immersion and Realism (IR) in VR-enabled shopping experiences influence users' Perceived Enjoyment (PE) of the technology. If users perceive the VR environment as immersive and realistic, they are more likely to enjoy their shopping experiences as they feel more engaged and present in the virtual environment. Higher immersion and realism may lead to greater enjoyment of VR-enabled shopping experiences as users feel more connected to the virtual world and the products within it.

The original branches of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are still crucial in the updated TAM model for VR adoption in online commerce since they have a direct impact on consumers' attitudes and intentions toward VR technology adoption. These categories encapsulate the perceived value and simplicity of VR purchasing, which are key factors in determining consumers' adoption and inclination to interact with the technology.

The updated model could not specifically include the branches of Actual Use, Behavioural Intention, and Attitude (ATT). This is because perceived enjoyment, social influence, immersion and realism serve as additional dimensions that complement and enrich users' attitudes and intentions towards VR adoption. These criteria comprise aspects of both attitude and behavioural intention since they influence consumers' overall judgments of the technology and their propensity to embrace it.

Furthermore, while real usage is a significant outcome variable in conventional TAM models, the modified model may not explicitly include it since it places more emphasis on the variables affecting users' initial adoption choices than on their behaviour after that. However, the effects of perceived enjoyment, social influence, immersion and realism on actual use can still be inferred indirectly, as they contribute to shaping users' attitudes and intentions towards continued usage of VR technology in online shopping.

It follows that the modified TAM model offers a comprehensive framework for understanding the adoption of VR technology in online shopping, capturing both cognitive and affective dimensions of users' evaluations and intentions. This is achieved by emphasizing perceived usefulness, perceived ease of use, perceived enjoyment, social influence, and immersion and realism.

6.4 Conclusions of the Study

Ultimately, this research examined the obstacles that impede the acceptance and utilisation of virtual reality (VR) in the realm of electronic commerce (e-commerce) in South Africa. The study aimed to achieve two primary goals: comprehending customers' perspectives about the use of virtual reality (VR) in the realm of South African e-commerce and ascertaining the ease of use of VR for consumers within this particular context. The results provided diverse and comprehensive insights into the participants' viewpoints about the effectiveness and user-friendliness of virtual reality (VR) in electronic commerce (e-commerce). Although participants expressed optimism

about the transformative capacity of virtual reality (VR) in altering the future of online retail, some problems and considerations were identified. Notable obstacles that were found include concerns about the expense and accessibility of VR equipment, possible challenges in learning and utilising VR, and issues over the authenticity of virtual representations.

Participants widely recognised the potential influence of virtual reality (VR) on decision-making in online purchases, expecting favourable results. Nevertheless, the research emphasised the need to adopt a sophisticated strategy that considers the unique characteristics of various product categories and the impact of external factors such as transparent return policies and information on product compatibility. Essentially, participants showed a shared excitement for incorporating virtual reality (VR) into e-commerce platforms. However, their worries highlighted the need to overcome these obstacles to improve consumer acceptance. This study provides useful insights into the complex dynamics surrounding the adoption of virtual reality (VR) in the e-commerce industry in South Africa. It establishes a basis for future research and offers strategic considerations for firms and governments that want to navigate this rapidly changing technological environment.

6.5 Recommendations

Based on the findings of the study, several recommendations emerge to address the identified barriers and enhance the adoption of virtual reality (VR) in e-commerce in South Africa:

- **Affordability and Accessibility of VR Headsets:** Investigate efforts to enhance the affordability and accessibility of virtual reality headsets for a wider range of consumers. Engage in partnerships with virtual reality manufacturers and technology suppliers to explore the possibility of introducing cost-effective alternatives or promotional deals.

- **User Training and Familiarization:** Create user-centric training programmes or tutorials to improve customers' understanding and mastery of VR technology. Explore collaborations with virtual reality (VR) hardware makers to provide interactive experiences or demos, addressing any concerns about the usability of VR technology for online buying.

- **Product Realism and Representations:** Allocate resources towards enhancing the authenticity of virtual product depictions in order to answer the concerns of participants.

Engage in partnerships with e-commerce platforms and virtual reality (VR) developers to improve the standard and precision of product visualisation, guaranteeing a more genuine online buying experience.

- **Tailored VR Experiences for Different Product Categories:** Optimise VR shopping experiences by tailoring them to certain product categories in order to enhance the relevance and efficacy of VR technology. Engage in more studies to comprehend the distinct demands and inclinations of customers for various categories of items inside a virtual reality setting.

- **Clear Return Policies and Product Compatibility Information:** Improve online platforms by offering clear and comprehensible return procedures. Make sure that there is easily accessible and detailed information on the compatibility of the goods, specifically addressing any worries about how well the product will fit and removing any ambiguity that potential buyers may have when making a purchase choice.

6.6 Areas for Future Research

Possible research areas include conducting longitudinal studies to evaluate the enduring effects of virtual reality on user behaviour and satisfaction, investigating the influence of demographic factors on the acceptance of VR, examining the challenges faced by e-commerce platforms in integrating VR, conducting detailed analyses of specific product categories, exploring the psychological aspects of decision-making influenced by VR, monitoring advancements in VR hardware technology, and considering cross-cultural perspectives on the adoption of VR. Furthermore, further investigation might focus on ethical issues, assess the influence of integrating virtual reality on corporate performance, and examine the significance of user-generated content in virtual reality shopping experiences. The proposed study paths seek to enhance our comprehension of the complex interaction between virtual reality technology and e-commerce, providing useful insights to inform future progress in the online buying domain.

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APPENDICES

APPENDIX A : Ethical Clearance

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Secretary: Mziyanda Ndede

13 December 2023

Ms Phendulwa Jaxa
c/o Department of Information Technology
CPUT

Reference no: 208150240/2023/29

Project title: The barriers to the adoption of virtual reality in e-commerce in South Africa

Approval period: 13 December 2023 – 31 December 2024

This is to certify that the Faculty of Informatics and Design Research Ethics Committee of the Cape Peninsula University of Technology approved the methodology and ethics of Ms Phendulwa Jaxa (208150240) for Magister Technologiae: Information and Communication Technology.

Any amendments, extension or other modifications to the protocol must be submitted to the Research Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

Prof L.J. Theo
Chair: Research Ethics Committee
Faculty of Informatics and Design
Cape Peninsula University of Technology

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Secretary: Mziyanda Ndede

13 December 2023

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Prof L.J. Theo
Chair: Research Ethics Committee
Faculty of Informatics and Design
Cape Peninsula University of Technology

APPENDIX B : Participant Consent Form

Cape Peninsula University of Technology

FID/REC/ICv0.1

FACULTY OF INFORMATICS AND DESIGN

Individual Consent for Research Participation

Title of the study:	**The barriers to the adoption of virtual reality in e-commerce in South Africa**	
Name of researcher:	Phendulwa Jaxa	
Contact details:	email: phendulwa.jaxa@gmail.com	phone:0685603036
Name of supervisor:	DR. Errol Francke	
Contact details:	email: franckee@cput.ac.za	phone:0824947851

Purpose of the Study: The aim of this study is to explore the barriers to the adoption of virtual reality in e-commerce in South Africa.

Participation: My participation will consist essentially of Cape Town online consumers.

Confidentiality: I have received assurance from the researcher that the information I will share will remain strictly confidential unless noted below. I understand that the contents will be used only for M Tech thesis and that my confidentiality will be protected by the use of pseudonyms *(explain how the confidentiality will be protected, e.g. use of pseudonyms etc).*

Anonymity will be protected by removing identification information from the recorded audio

Conservation of data: The data collected will be encrypted and kept in a password-controlled environment on the university data management plan platform.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I can withdraw from the study at any time and/or refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, all data gathered until the time of withdrawal will be considered and used.

Additional consent: I make the following stipulations (please tick as appropriate):

	In thesis	In research publications	Both	Neither
My image may be used:			X	
My name may be used:			X	
My exact words may be used:			X	
Any other (stipulate):	None	None	None	None

Acceptance: I, *Tanya Williams* agree to participate in the above research study conducted by (*Phendulwa Jaxa)* of the Faculty of Informatics and Design (*Information Technology)* at the Cape Peninsula University of Technology, which research is under the supervision of *(Dr. Errol Francke).*

If I have any questions about the study, I may contact the researcher or the supervisor. If I have any questions regarding the ethical conduct of this study, I may contact the secretary of the Faculty Research Ethics Committee at 021 469 1012, or email naidoove@cput.ac.za.

Participant's signature:

Date: 1 December 2023

Researcher's signature: ___ pjaxa ___ Date: _03 December_2023_____

APPENDIX C: Interview Protocol

Part 1: Demographics

1. What is your age group?

18-25 years	
26-35 years	
36-45 years	
+ 45 years	

2. What is your gender?

Male	
Female	

3. What is your IT skill Level?

4. VR Usage:

Familiarity with VR Technology?	
Experience Using VR for E-commerce?	

5. E-commerce Behaviour:

Frequency of Online Shopping?	
Preferred E-commerce Platforms?	

Part 2: Perceived Ease of Use of Virtual Reality in E-commerce

1. Ease of Use Perception

- How would you describe the ease of using VR for e-commerce activities?
- TAM Component (Perceived Ease of Use): What aspects of VR technology make it easy or challenging for you to navigate during online shopping?
- Have you faced any specific challenges or difficulties while using VR for online shopping?
- TAM Component (Perceived Ease of Use): Can you elaborate on any usability issues you have encountered that affected your VR-based shopping experience?

2. Adoption Barriers

- Are there any obstacles that deter you from using VR in online shopping?
- TAM Component (Perceived Ease of Use): Do these barriers relate to difficulties in using VR technology or doubts about its convenience in e-commerce?

Part 3: Perceived Usefulness of Virtual Reality in E-commerce

1. Perception of VR's Utility

- How do you perceive VR's role in improving the online shopping experience?
- TAM Component (Perceived Usefulness): In what ways do you believe VR enhances or could enhance your overall shopping encounters compared to traditional online methods?
- Can you share specific benefits or instances where VR positively impacted your shopping experience?
- TAM Component (Perceived Usefulness): How did these benefits align with your expectations of VR's usefulness in e-commerce?

2. Attitude

- What is your overall perception regarding the utility and efficacy of VR technology in augmenting the online shopping experience?
- TAM Component (Attitude): How favourable or unfavourable is your disposition towards VR for online shopping based on your experiences or perceptions?

Part 4: Behavioural Intention and Actual Use

1. Impact on Decision Making

- In what ways would VR influence your decision-making process while shopping online?
- TAM Component (Behavioural Intention): How does VR's influence impact your willingness or inclination to use this technology for future online purchases?

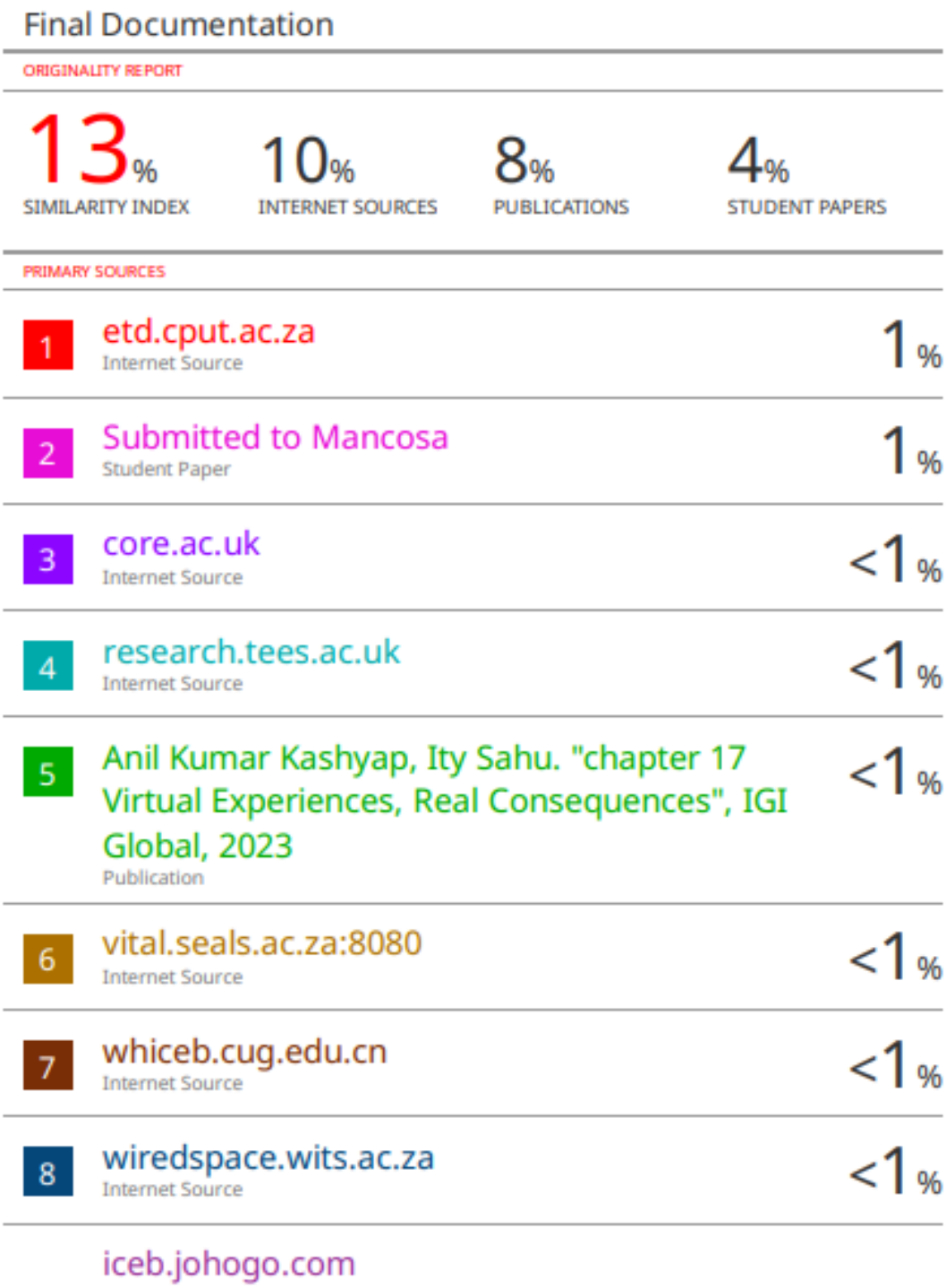
2. Actual Use

- Have you actively used VR technology for online shopping?
- TAM Component (Actual Use): Can you share your personal experiences or instances where you have actively used VR in your online shopping activities?

Conclusion

- Is there any other perspective or insight you would like to share regarding VR in e-commerce?
- Are there any aspects of VR's role in online shopping that we have not discussed but are crucial for understanding its adoption and use?

APPENDIX D: Turnitin Report



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APPENDIX E: Editing Certificate

DR PATRICIA HARPUR

B.Sc Information Systems Software Engineering, B.Sc Information Systems (Hons)
M.Sc Information Systems, D.Technology Information Technology

Editing Certificate

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To Whom It May Concern

This document certifies I have copy-edited the following thesis by Phendulwa Jaxa:

THE BARRIERS TO THE ADOPTION OF VIRTUAL REALITY IN E-COMMERCE IN SOUTH AFRICA

Please note this does not cover any content, conceptual organisation, or textual changes made after the editing process.

Best regards

Dr Patricia Harpur

25 June 2024
