

Exploring Augmented Reality's Influence on Consumer Purchase Intentions of Generation Z

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Abstract:

The use of emerging technologies in the expanding e-commerce environment is changing the relationship between customers and purchasing behavior. Among these key technologies, Augmented Realities (AR) have become an evolutionary change in connecting the digital and physical worlds. This study aims to examine the influence of augmented reality on purchase intentions of Generation 'Z' consumers. Young people between the ages of 11 and 26 frequently use AR to purchase clothes and accessories, and stores can often be accessed locally via smartphone apps. The previous researches show that novelty has a significant impact on purchasing decision making and can be used in marketing communications. According to the results, it can be said that gender and age have an impact on the personal response to AR. Researches show that clothing and accessories are the most purchased products through AR. In most of the researches, it is found that there are no significant differences according to age and family members. Respondents said their AR experience was good and that the desire to seek novelty had a more significant impact on purchasing decisions than perceived ease of uses, and that they found it helpful. Generation Z customers have a strong relationship with digital experiences, so they will be key decision-makers for the future of online business. As this tech-savvy generation becomes a dominant force in the consumer market, recognizing the impact of augmented reality (AR) on online shopping behaviour is inevitable but essential for businesses looking to survive in the digital economy.

Keywords: Augmented reality (AR); purchase intention; online purchase; purchasing decisions; consumer behaviour

1. Introduction

Augmented Reality (AR) is one of the latest technologies that is changing the way we interact with our environment. Augmented reality enhances the real world with digital information, which is a modern technology that covers digital information over real-world objects or places to enhance the customer experience. It is not a virtual reality, which is a technology that creates a digital or computer-generated environment. The Augmented reality, which combines physical data with digital data, has been researched and used in medicine, business, museums, fashion and many other fields. These technologies continue to influence consumer behavior as they provide new and meaningful ways to interact with products and services. Moreover, its use in the current human-computer encounter is seen as a new technology, and its acceptance is increasingly influencing the use of interactive technology. Technological advances continue to change the way consumers interact with products and make purchasing decisions in the changing e-commerce landscape. As the first generation grows up in this digital era, Generation Z (Gen Z) consumers represent a key demographic group whose preferences and behaviors help in shaping the future of online business.

In 2020, Augmented Reality (AR) has already had a huge impact on everything from education to remote working, and will continue to do so in the future. AR technology has the capability in increasing the intensity and efficiency of medical education in many areas, from programming MRI equipment to perform complex surgeries (Dhar,P, 2021). In today's retail market, shoppers rely on their smartphones to learn more about products, and world-famous motorcycle brand Harley-Davidson is a good example of a brand investing in this model by creating an AR app that buyers can use at shopping centre. In the servicing sector, workers are started to use AR headsets and glasses while doing their jobs, providing information on the subject in the field, requesting alternatives and pointing out any problems that may occur. From interior designing to the field of construction and, the augmented reality helps the professionals to visualize their final designs during the process of creativity which makes the customers satisfied before moving on to the actual designing process (Saif,S, 2020).

AR has broad prospects for improving performance and reducing costs in all areas of the company's logistics (such as transportation, warehousing, route optimization, etc.). It Provide the best experience. Entertainment companies now see augmented reality as a good product to strengthen the relationship between their characters and their audience. Augmented reality technology is rapidly becoming an important part of daily life. AR refers to a virtual environment that attempts to recreate the same and realistic world while integrating digital information into our physical environment.

2. Statement of the Problem

In today's e-commerce world, the rapid advancement of technology has resulted in a new era of customer engagement via Augmented Reality (AR). Understanding the consequences of AR on their online buying behaviour and purchase intention is especially important for businesses seeking effective strategies as Generation Z (Gen Z) emerges as a major force in the consumer market. Despite the growing prevalence of Augmented Reality (AR) applications in the retail industry, there is an invalid in the research regarding the subtle impact of AR on the decision-making processes of Gen Z customers in the online buying environment. The problem at stake is the need to understand how the introduction of AR technologies effects, how consumers from Generation Z engage with online platforms, make purchasing decisions, and ultimately form purchase intents.

The specific characteristics of Gen Z, such as their digital nativism, dependence on technology, and demand for personalised and immersive experiences, raise critical considerations about the effectiveness of AR in altering their online purchasing behaviours. The absence of extensive research addressing these questions leaves firms and marketers unsure of how to use AR to improve the online purchasing experience for Generation 'Z' consumers. And so, the aim of this study is to bridge the gap by investigating the impact of augmented realities (AR) on the online purchase intention and behaviour of Gen Z consumers. This research seeks to provide valuable insights for businesses, marketers, and policymakers to formulate informed strategies that align with the preferences and expectations of this tech-savvy generation through an in-depth exploration of the multifaceted relationship between AR and Gen Z consumer dynamics.

The main research question is: What role does the Augmented reality technology play in influencing the consumers? The results of this study will explain the effect of Augmented reality on consumers' purchase decision and intention to purchase and its involvement in developing various marketing strategies to attract new customers and how it helps in retaining the purchase power of existing customers.

3. Objectives and scope of the study

- To study the demographic characteristics and attitude of Augmented Reality (AR) purchases of Generation Z consumers
- To examine the relationship between the factors that influence Augmented Reality (AR) adoption and consumer purchase decisions
- To evaluate the influence of Augmented Reality on purchase intention among Gen Z consumers

The scope of the study is to analyse the impact of AR adoption on various e-commerce platforms, which includes how different platforms implement AR features and their impact on Gen Z consumers. It will focus on a specific timeframe to analyse trends and changes in Gen Z consumers' behaviour and AR adoption over time.

This study can also help businesses and marketers to adapt their strategy depending on its findings.

4. Theoretical framework and Literature Review

AR is an enhanced representation of the real world made possible by the use of cybernetic computerised information. The content can be given using a variety of sensory modes, including auditory, visual, haptic, sensory, and ol-factory. Augmented Reality can be defined as a technology that integrates the physical and virtual worlds, supporting real-time interactions, and effectively recording the virtual and actual objects. The first AR technology was developed by the Computer Scientist, Ivan Sutherland in the year 1968 at Harvard by creating his first AR-mounted display system. A Boeing computer services researcher, Thomas Caudell in 1990, coined the term Augmented reality to describe how the head mounted display works when the electricians assembled the complicated wiring system.

Augmented reality (AR) is an innovative marketing technic that overlays or superimposes digital content or information such as text, graphics, geographical information, videos and audios over a real-time view of physical objects and events. (Carmigniani et al., 2011; Fan et al., 2020; Sung et al., 2021). AR establishes a stronger connection between users' physical space and virtual space. As a result, the AR user experience becomes increasingly mystical, bright, engaging, and life like (Cipresso et al., 2018).

According to the study, (alHilal, N. S. H. 2023) AR-based applications had a substantial impact on unanticipated purchases by consumers due to online engagement, ease of use, and pleasure, which influences the consumer satisfaction. This impact of augmented reality on consumer behaviour has been discovered, with the bulk of the factors which is stated in the Technology Acceptance Model (TAM; Davis, 1989) becomes relevant. AR has been demonstrated to boost customer sentiments towards products, produce key verbal marketing communication, and impact repeat purchases from brands who offer AR experiences. Flavián, C., Gurrea, R., & Orús, C. (2023) in their study demonstrates that AR helps in reducing the negative thoughts that consumers might experience during the choice process, such as confusion and dissonance. According to the findings in the study, employing augmented reality on websites can influence cognitive factors and improve corporate revenues by increasing purchase intent and willingness to pay more. AR, in particular, reduces cognitive dissonance by minimising apparent similarity and uncertainty caused by over choice, resulting in increased buy intentions and a willingness to pay more for the goods. The findings suggest that businesses should make computer-accessible AR web services available on their e-commerce sites in order to reap direct economic benefits and improve the customer experience. This includes economic advantages from increasing purchase intents and sales margins, as well as improved customer experience by decreasing negative aspects during the purchasing process.

Perannagari, K. T., & Chakrabarti, S. (2019) in their study provided both informative and enjoyable experiences, augmented reality advertising can greatly improve consumer engagement, leading to greater purchase intent. Marketers should think about implementing augmented reality into their advertising campaigns since it enables interactive experiences with customers and can affect purchase intention. Marketers need to keep up with technological changes if they wish to compete and survive in the market in the future, particularly

in the background of developing technologies such as augmented reality.

Saleem M et.al (2022) in their study stated the impact of augmented reality advertising on purchase intention of consumers. The study focused on variables such as informativeness, entertainment, credibility, and dissatisfaction that influence purchase intention, and the findings showed that the informativeness, entertainment, credibility, and dissatisfaction of AR advertisements had a significant impact on advertising value and purchase intention. A range of factors is influencing the adoption of augmented reality (AR) among Gen Z consumers. Jiang (2021) found that perceived relative advantage, compatibility, and observability, as well as attitudes and perceived value, play a significant role in shaping the consumers intentions to use AR shopping applications. Kahawandala (2020) further identified market mavenism, technology self-efficacy, and social identity as key determinants of purchasing behavior in this demographic. Nur (2021) highlighted the significance of performance expectancy, social influences, facilitating conditions, perceived enjoyment, and trust in the adoption of mobile payment methods, which are closely related to AR technology. Lastly, McCoy (2021) emphasized the influence of attitude, subjective norms, perceived effectiveness, past environmental behavior, and leadership in the intention to use collaborative apparel consumption services, which may also be relevant to AR adoption by consumers. These findings collectively suggest that Gen Z's adoption of AR is influenced by a complex interplay of perceived value, social identity, and environmental consciousness.

4.1 Perceived Ease of uses

Perceived ease of uses can be defined as a person's belief that using a particular idea requires no effort (Davis, 1989). As one's perception on the ease of using a particular technology increase, their intentions to use that technology also increases. Keni Keni (2020) concluded in a study that effectiveness and perceived ease of use play a key role in influencing the customer directly and indirectly, repeating the goal, thus ensuring that customers are satisfied and trustworthy, and trust plays a key role in the business.

4.2 Perceived Usefulness

Venkatesh et al.'s (2003) expanded TAM model identified perceived usefulness as a key determinant of behavioural intention to utilise a specific technology. Mun and Hwang (2003) discovered a positive and significant impact between perceived usefulness and behavioural intention. Perceived usefulness can be referred to a one's belief that using a particular technology will be much beneficial for one (Davis, 1989). As people's perception of technology increases, their intention to use it also increases. The TAM framework suggests that perceived usefulness directly predicts behavioral intentions to use technology (Park et al., 2014). Perceived usefulness refers to a one's belief that using a particular system will improve one's job performance. Davis, Bagozzi, and Warshaw (1989) argued that perceived usefulness is an important aspect of TAM and influences behavior.

4.3 Purchase Intention

Purchase intention refers how likely consumers are to make a purchase after considering service quality, environmental factors, and food quality. Diana, D et.al (2023) in the study AR shopping in E-commerce to increase purchase intention, stated that AR helps customers to visualize and feel the products they intend to buy in the real world, addressing the challenge of visualizing the products in online shopping and the interactivity of AR perceived by customers can positively affect consumer attitudes and intentions, leading to increased purchase intention. The study proposed by Ha, N. (2020) examined the impact of AR usage on the consumers of Vietnams' online shopping intention based on Technology Acceptance Model (TAM; Davis, 1989), and Theory of Planned Behavior (TPB, Ajzen, I. (1991)). The variables like perceived usefulness, perceived ease of uses, attitudes and subjective norms had significant impact on consumers online purchase intention which shows similar results of Hsin Chang and Wen Chen (2008). The study concluded that the web site quality and web site brand affect consumers' trust and perceived risks, and also it impacts the consumers' purchase intention. The fig.1, below shows the Technology Acceptance Model (TAM; Davis, 1989) adopted by Ha, N. (2020) with reference to Davis et al., 1989.

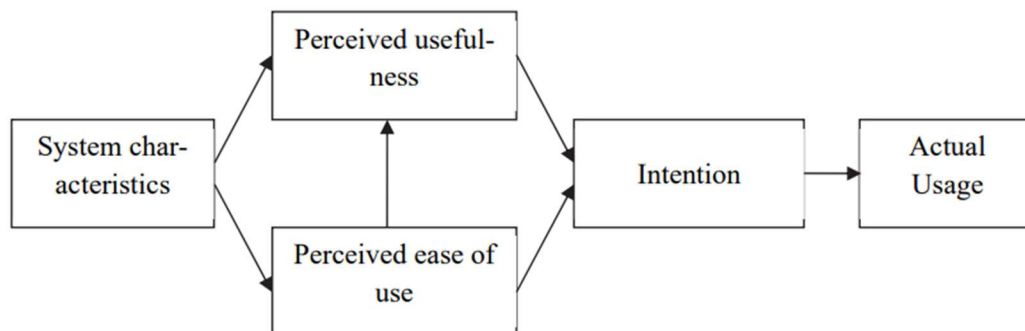


Fig. 1. Technology Acceptance Model

Source: Davis et al., 1989

4.4 Demographic characteristics and attitude towards AR online purchases

AR technology shows exploratory behaviour in consumers, which influences their intention to purchase, Wang, Y., Ko, E. and Wang, H. (2022). Finding a similar result, Atasoy, Tosik-Gün, and Kocaman-Karoğlu (2018) indicated that the frequent use of internet had no significant effect on attitudes towards AR; people who frequently use online resources had lesser attitude scores. The study suggests that students have a positive view towards AR applications. Gender and ownership of personal computers and mobile devices did not impact opinions towards AR applications. This conclusion could be related to the reality that those who use technology less frequently consider it as more desirable.

In a study (Sirakaya, M., & Kılıç Çakmak, E. (2018), it was found that high school students have positive attitude towards AR applications. The use of AR technology was found to increase students' interest

and motivation, and to provide active and interactive learning environments. The study also found that ease of use was a most significant factor in shaping students' attitudes toward AR, and that no major differences in AR attitudes was found on basis of gender. However, the frequency of playing computer games was found to significantly affect students' attitudes toward AR.

Do, H. N., Shih, W., & Ha, Q. A. (2020) in their studies examined user satisfaction and contentment with Mobile AR apps had significant impact on tourist impulse buying. The study discovered that the likelihood of impulse purchases increased as customer satisfaction with the increase of app increased. The study also discovered that mobile AR apps had a substantial impact on tourists' impulse purchase behaviour. In short, as user happiness with Mobile AR grows, so does the possibility of tourists making impulse purchases.

4.5 Relationship between AR usage and purchase behaviour

Although Augmented Reality Shopping Applications (ARSAs) can give numerous benefits in the online shopping market, their adoption has not yet met expectations and is not commonly employed (Yim and Park, 2019). The issue in this is because, ARSA is an application tool used by penetration technology, and potential users are still cautious about using it. Chakraborty and Gupta (n.d., 2017) conducted a study on the influence of Augmented Reality adoption among Indian customers, which included variables such as personality, innovation seeking behaviour, tech savvy, and shopping experience seeking behaviour. In this study, these factors were analysed using Logistic Regression to determine their impact on Indian customers' adoption of augmented reality when purchasing online.

The study conducted by F. A. Ibrahim and Al (2023) aims to examine the impact of field level and AR technology on consumer demand in real estate and the influential models of consumer purchasing behavior. The study found a significant relationship between AR technology, and real estate purchase intentions. This concept is confirmed by Samarth Singh's (2023) research, which finds a significant and favourable relationship with augmented reality (AR) and purchase intention. The study is consistent with previous findings conducted by Saleem et al. It uses the Technology Acceptance Models (TAM; Davis, 1989), which also establishes a relationship with AR and purchase intention.

4.6 Influence of AR on purchase intention of Generation Z

Raška, K., & Richter, T. (2017) in their study, the Influence of Augmented Reality on Purchase Intention, states that how AR applications, such as the IKEA AR app, can positively influence consumer attitudes, product knowledge, and purchase intentions, providing valuable thoughts for marketers and businesses seeking to support AR technology in their strategies. Raheja, G., & Gupta, S. (2023) in their study highlights the significance of considering various AR factors while defining AR experiences for the consumers. Overall, the study reveals that AR technology can be a successful promotional tool for businesses that target Indian consumers, and its potential use should be explored further. Diana, D, et.al. (2023) conducted a study on the Implementation of Augmented Reality in online shopping to increase the consumers' Purchase intention recognises that using augmented reality favourably influences their online purchase decision of the products

and make it easier to visualise the product they tend to purchase.

Sin, S., et al. (2012) identified three factors that influence Malaysian young consumers' online purchase intentions on social media websites, viz; the perceived ease of use, the perceived usefulness, and the subjective norm. The study's findings revealed that perceived usefulness was the most important variable influencing young customers' online purchase intention via social media, followed by the perceived ease of use and the subjective norm.

Zhuang et al. (2021) concluded that green perceived value, attitudes, and trust had a significant positive impact on green purchasing intention. And also, perceived behavioural control, perceived consumer effectiveness, and subjective norm, all have a significant positive influence on green purchasing intentions. It increases the chance of acquiring environmentally friendly products, implying that green perceived risk has a major adverse effect on green purchase intent.

5. Methodology & Data

5.1 Sample size and data collection

The study focuses on both quantitative and qualitative methods to provide a complete understanding of the problem, suggesting a research methodology to investigate the impact of Augmented Reality (AR) on the purchase intention of Generation 'Z' online customers. The respondents are of the age group 11 years to 26 years of adolescence. The sample size taken is 225, and the respondents are school and college students of Kerala. The Data collection method has used a random sampling technique which was prepared based on the previous studies and theoretical frameworks. The samples taken for this study comprises of AR users who participated in the purchase process.

5.2 Research Tools used

The study utilised a questionnaire method for data on the impact of Augmented Reality (AR) on the purchase Intention of Generation Z online consumers. The questionnaire was distributed to the adolescence of the age group 11 to 26 years who use the Augmented reality technology to make their online purchases. The analysis is completed with SPSS statistical tool and the tests used are chi-square, Pearson's correlation and regression analysis.

5.3 Research framework

From previous studies, it is noted that the augmented reality (AR) will positively impact the purchase decisions of individuals. In this research, certain factors of AR are considered that influence the purchase decision of consumers. Those factors are Perceived Ease of Use (PEU), Innovation Seeking Behaviour (ISB), Perceived Usefulness (PU), Customization (CU) and Shopping Experience Seeking Behaviour (SESB) (Chakraborty et.al, 2018). So, the aim of the study is to analyse and find the AR factors which impact the youngsters in their purchase decisions and what they would buy? A 30-item questionnaire was developed and distributed to the samples of generation Z. Here, the dependent factor is the online purchase intention and the mediating factors are the demographic factors such as age and gender. The dependent-independent relationship factors are represented with a conceptual framework.

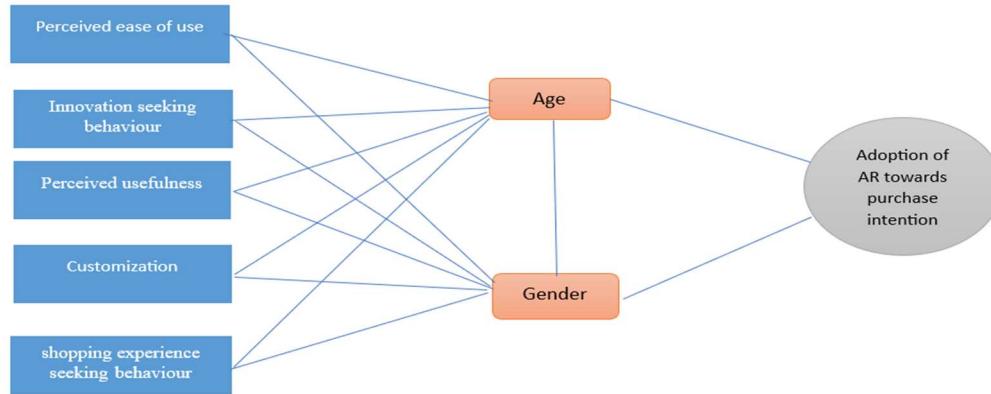


Figure 1: Conceptual model of factors influencing the adoption of AR in online purchase decision

5.4 Research design and questionnaire

The study was carried out by collecting the data through an assessment using electronic questionnaire to find out the impact of the adoption of AR to understand the online purchase behaviour and purchase intention of Generation Z consumers; where the Gen Z consumers included between the age group of 11-26 years. The researcher emphasised the importance of respondents, to the study the questionnaire and encouraged them to share it with family and friends who employed AR technology during the shopping process.

5.5 Statistical analysis

H1: There is significant effect on the demographic characteristics and attitude regarding AR online shopping

Below shown table 1 describes the demographic information showing gender ratio with respect to the usage of AR. A total of 229 samples where there, out of which only 225 responses turned out to be actual and complete. Out of 225 samples, 42.8% male 55.5% female uses AR for online purchases.

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	98	42.8	43.6	43.6
Female	127	55.5	56.4	100.0
Total No.	225	98.3	100.0	

Missing Items	4	1.7		
Total No.	229	100.0		

Table 1: Ratio of gender characteristics with respect to the usage of Augmented Reality

The below indicated table 2, indicates the relationship between the gender and the attitude towards adoption of AR technology using chi-square test. The resultant p-value is greater than 0.05 then it satisfies the alternative hypothesis. Here $p=0.044$, i.e, $p<0.05$ which shows a significant association between the variables, i.e, the independent variables, gender and the dependent variable, attitude towards AR online purchases.

Chi-Square Tests

	Values	Df	Asymptotic Significance (2-sided)	Exact Significance (2-sided)	Exact Sig. (1-sided)
Pearson’s Chi-Square	4.192	1	.041		
Continuity Corrections	3.659	1	.056		
Like-li-hood Ratios	4.211	1	.040		
Fisher's Exact Tests				.044	.028
Linear-by-Linear Associations	4.173	1	.041		
No. of Valid Items	225				

Table 2: Chi-square test showing a relationship between the attitude and gender of respondents

Table 3, shows one or more demographic characteristics that are found to have statistically significant coefficients, it suggests that these variables are associated with attitudes towards AR online purchases among the target population. Here the demographic variables defined are age, gender and income are measured and if found, $p\text{-value}>0.05$ then that the demographic characteristics is found to be significant. $P=0.016$ which is greater than 0.05 and so the variable age is found to have statistically significant coefficients, it suggests that these variables are associated with attitudes towards AR online purchases among the target population.

A positive coefficient denotes a positive effect, while a negative coefficient implies a negative relationship. Here, demographic parameters such as age and income have a negative association with the dependent variable, which is the attitude towards AR online purchases, whereas gender has a favourable link. The R-squared number is a part of the variance in the dependent variable that is supported by the independent variables. A greater R-squared implies a better fit for the model. Here, the R-squared value ranging from 0.5 to 1, which indicates a huge proportion of the variability in the dependent variable which is explained by the independent variables. This suggests that this model provides a good fit to the data.

Model Summary for AR factors and purchase intention showing Regressions analysis

Model	R	R- Square	Adjusted R- Square	Std. Error of the Estimate
1	.161 ^a	.026	.022	.495
2	.235 ^b	.055	.047	.489
3	.290 ^c	.084	.072	.482

Table 3: Regression analysis

H3: Perceived ease of use is significantly associated with AR online purchase intention among Generation Z consumers.

H4: Innovation-seeking behavior is significantly associated with AR online purchase intention among Generation Z consumers.

H5: Perceived usefulness is significantly associated with AR online purchase intention among Generation Z consumers.

H6: Customization is significantly associated with AR online purchase intention among Generation Z consumers.

H7: Shopping experience seeking behaviour is significantly associated with AR online purchase intention among Generation Z consumers.

Coefficients of Correlation^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.188	.361		.520	.604		
	PEU1	.105	.053	.088	1.969	.050	.736	1.360
	PEU2	.032	.050	.026	.626	.532	.856	1.168
	ISB1	.004	.082	.004	.054	.957	.290	3.449
	IB2	.015	.071	.013	.210	.834	.401	2.494
	PU1	.382	.056	.461	6.793	<.001	.323	3.098
	PU2	-.248	.059	-.277	-4.225	<.001	.344	2.904
	CU1	-.049	.073	-.043	-.675	.501	.362	2.763
	CU2	-.172	.064	-.137	-2.685	.008	.571	1.751
	SESB1	.480	.057	.469	8.473	<.001	.485	2.061
	SESB2	.446	.073	.409	6.092	<.001	.329	3.044

a. Dependent Variable: Purchase Intention

Table 4: shows co-relation of coefficient test which implies the relationship with the dependent and independent variables

Table No. 4, shows the dependent and independent variables relationship. The significant results of H4, shows that Innovation seeking behaviour has a positive significant relationship with the online AR purchase intention. Other variables like Perceived Ease of Uses (PEU), Perceived Usefulness (PU), Customization (CU) and Shopping Experience Seeking Behaviour (SESB) a less significance with the usage of AR technology which drives the customers to online purchase intention.

Conclusion and Implications

The introduction of augmented reality into the online buying experience has a noticeable favourable impact on Generation Z customers' purchasing habits. The interactive and immersive quality of AR applications helps to higher engagement, helping customers to better visualise products and make educated purchasing decisions. The study found a substantial link between AR adoption and increased purchasing intention among Generation Z customers. AR's capacity to bridge the digital and physical worlds, providing realistic and customised experiences, helps to a more positive attitude towards online purchases. When Generation Z consumers find AR-driven online purchasing technology easy to use, they are more inclined to adopt the technology. User-friendly interfaces and intuitive interactions are critical factors in determining their adoption and continuing use.

While this study gives useful information, there is still opportunity for future investigation. Future research might investigate into the long-term effects of AR adoption on Generation Z consumer behaviour, potential barriers, and the changing environment of AR technology in online commerce. So, we can conclude by stating that, the impact of augmented reality on Generation Z customers' online buying behaviour and intentions is a significant and positive trend. Businesses that strategically use AR technologies will gain a competitive advantage in winning the attention and loyalty of this crucial consumer sector in the constantly evolving digital marketplace, (Prabudha, 2024).

Limitation and future scope

The sample size of this study is quite limited, as it is taken from a huge population. A good example of learning would be around 600 samples. The age group is aimed at the population between the ages of 11-26. Additionally, the large number of female participants in this study is another limitation. Most participants do not understand the concept of augmented reality as it has not become much popular among common man; This is mainly highlighted in most of the researches as the marketers should initiate an awareness to the customers of technologies like augmented reality. Future researchers may shift their research focus from academic research to market orientation. The limitations mentioned about the above population should also be taken into account to expand the depth of the study.

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