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Augmented Reality and Purchase Decision: The Path through Customer Engagement

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ABSTRACT

The purpose of the investigation is to analyze the influence of augmented reality on purchase decisions, with a particular focus on the mediating role of customer engagement. This investigation adopts a quantitative approach, data were collected through a structured online questionnaire targeting online AR experience consumers in Pakistan who have used AR features on e-commerce platforms. Non-Probability purposive sampling was employed to reach individuals with the relevant experience. A total of 280 responses were gathered out of the intended 350. Results indicate that augmented reality, assessment orientation, assurance quality, vividness, novelty, and interactivity has positive correlation with customer engagement. Customer engagement has positive association with purchase decision. These findings highlight the importance of augmented reality as a strategic tool in e-commerce platforms, particularly in enhancing consumer engagement, which in turn positively influences their purchase decisions. The finding of the investigation contributes valuable insights to the fields of marketing and consumer behavior, emphasizing the importance of leveraging AR technologies to foster deeper engagement with customer and ultimately influence their purchasing decisions in the online retail environment

1 Introduction

Although a lot of consumer's value effective consumption experiences offered by standardized goods and facilities, these suggestions repeatedly fail to provide clients with amusing, imaginative, and entertaining experiences. Augmented reality (AR) may transform basic relationships with conventional products and amenities turn into consumer-generated unique landscapes by adding virtual elements to their direct experience of the environment (Scholz & Duffy, 2018). Since many businesses are starting to use augmented reality (AR) to enhance consumer interactions (Flavián et al., 2019; Han et al., 2018; Azzaakiyyah et al., 2024), particularly during virtual and offline buying journeys (Hilken et al., 2018; Ausat et al., 2024), there is an increasing need to comprehend the special advantages of using AR for creative activities in sales. A unique type of product or service visualization is made possible by AR, which smoothly projects virtual content (like a virtual sofa) into the actual world as perceived by the client (like their living room). This reduces tangibleness (Heller et al., 2019), increases motivation (Rauschnabel et al., 2019), and promises to foster creativity in the choices clients make about what to buy (Scholz & Duffy, 2018).

Digitalization and technological advances have fundamentally altered the environment for e-commerce marketing deployments and management (Pascucci et al., 2023). It has altered the way that customers purchase, both online and in physical stores (Diaa, 2022). Consumer involvement has increased as a result of internet-based skills particularly the use of augmented reality (AR) (Marc et al., 2023). AR has been shown in several studies to play important transformative parts in a number of businesses, including gaming and enjoyment (Mallika & Mudita, 2022), health (Uppot et al., 2019), academia (Negm, 2023, 2024), commerce (Flavián et al., 2019), and travel (Leung et al., 2023).

The potential benefits of the application of AR throughout the entire client buying trip have been proclaimed in both theoretical research papers (e.g., Badriyah et al., 2025; Ruyter et al., 2020; Flavi n et al., 2019; Hilken et al., 2018) and practitioner-oriented reports (e.g., Boston Consulting Group, 2018). Specifically, the case in point is the study produced by Poushneh and Vasquez-Parraga (2017) who describe the impact of AR on the likelihood of a purchaser to buy it. These research findings indicate that direct product experiences have been replicated through the use of AR in business environments in an attempt to raise sales (Hilken et al., 2017). An example is LOr local application, which allows the user to virtually tries on greasepaint and add it to the cart by simply using the camera of the smartphone and KabaQ, a mobile AR application, which allow the user to virtually preview the food and beverage items available in a restaurant by viewing complex interactive holograms during the decision-making process. Besides minimizing the perceived risk of purchase (Alimamy et al., 2017), scholars describe such augmented reality apps as the effective methods of communicating the entire information about the products (Khalid et al., 2024; Smink et al., 2019; Yaoyuneyong et al., 2016). As well, even greater research is examining the possible benefits associated with how AR can make consumers feel good about their purchases (Kousar et al., 2023; Ziaullah et al., 2023; Abbas et al., 2023). According to Dacko (2017), customers feel that mobile augmented reality (AR) applications in retail store hubs go a long way into increasing their purchasing confidence and satisfaction, whereas Hilken et al. (2017) and Heller et al. (2019a) reveal that AR makes clients feel better about making online purchases.

According to Grewal et al. (2020) and Hilken et al. (2017), AR enhances the sense of physical presence by presenting the material in a way that is familiar to the user. Customers' touchpoints in the digital experience are amplified by this immersive user experience, which increases customer happiness (Chylinski et al., 2020). According to industry projections, AR has the potential to revolutionize the marketing field and will become a more important technology for promoting products and services (Hinsch et al., 2020; Rauchnabel et al., 2022). The global mobile augmented reality industry is probable to range $36.26 billion by 2026, up from $12.45 billion in 2021, according to Statista (2023). However, retention remains a significant issue. AR-branded applications are being employed in marketing strategies to satisfy consumers' experience demands and add value to their purchasing decisions (Arghashi, 2022; Xue et al., 2022).

Despite AR apps having rich evidence of promoting purchase, researchers have raised concerns related to data security and privacy in AR (Hilken et al., 2017; Smink et al., 2020), absence of some potential gratifications, such as information quality, communication quality and engagement with technology (Chung et al., 2015). Some researchers have found that customers have a feeling of inauthentic self (Batat, 2021; Scholz and Duffy, 2018). The purpose of this investigation is to analyze that impact of augmented reality on purchase decision through mediating role of customer engagement.

2 Literature Review

Augmented Reality and Customer Engagement

AR is transforming customer engagement with its experiences that are immersive and rich (Bajpai & Islam, 2022; Enyejo et al., 2024; Ganesan & Kumar, 2024). AR virtual try-on, the personalization of the product, and direct interaction as the plot of the story are only some of what can make this technology

so engaging and increase brand contact (Tunnufus et al., 2024). It promotes social sharing and community participation in which users can post experiences, ask questions and others, and cooperate making informed purchases (Gul et al., 2023; Thakkar et al., 2023; Riaz et al., 2023). Due to this, AR is able and capable of impacting both the personal buying decision and strengthening the connection between a brand and customer, creating both an advocacy and long-term loyalty (Kim et al., 2023; McLean & Wilson, 2019; Romano et al., 2021; Liu et al., 2025). The presence of AR mirrors and interactive screens in the stores provides the clients with an imaginative and enjoyable experience of interaction with goods (Kim et al., 2023; Liu et al., 2024). Customer engagement made possible with the use of AR is emerging as a pivotal constituent of effective marketing campaigns in an increasingly digital and competitive market because it provides marketers with a powerful method of winning and impressing prospective customers. With its immersive and engaging experiences, AR is revolutionizing customer engagement (Kim et al., 2023; Romano et al., 2021; Tarar et al., 2024). Building upon the theory of the consumer decision-making process, an optimistic purchase experience is expected to lead to increased customer engagement. Studies suggest that a satisfying shopping experience fosters a stronger connection with the brand and motivates customers to actively participate in brand interactions (Huang & Chung, 2024).

H1: Augmented reality has positive impact on customer engagement.

Assessment Orientation and Customer Engagement

The circumstances in which innovation arises in consumer contexts are categorized by recent reviews of creativity research (Mehta & Dahl, 2019; Shahid and Ahmad, 2024). These reviews outline a variety of interrelated situational, motivational, cognitive, and emotional conditions that foster creativity. When combined, these states show increased levels of customer engagement, which the majority of current marketing works defines as a client's voluntarily and naturally driven venture of incomes into a particular communication with a business (Hollebeek et al., 2019). They also highlight the fact that these assets are multifaceted, meaning they may include both mental and emotional assets, such as information, time and effort, and feelings. Based on this, we adopt a more focused perspective on client involvement that is pertinent to the idea of customer inspiration as an activity driven by internal motivation. To be more precise, we use the literature from consumer research (Higgins & Scholer, 2009) and human–computer communication (Oh et al., 2018) to define customer engagement as a client's continuous focus on a technology-enabled movement—represented by a state of satisfaction, engagement, and absorption. When AR is used to enhance consumer creativity, the creative process adopts elements of the technology. Current augmented reality apps often seek to promote interaction (Scholz & Smith, 2016). For instance, they may take the shape of enjoyable, entertaining, and immersive experiences where users may test out different purchasing options in diverse settings (Scholz & Duffy, 2018). Additionally, studies have shown that using AR improves consumer involvement (e.g., with a buying choice; Hilken et al., 2020). Prior research by Jessen et al. (2020) demonstrated that assessment orientation improves customer involvement.

H2: Assessment orientation has positive impact on customer engagement.

Assurance Quality and Customer Engagement

Because consumers may obtain quick feedback via any channel, it is crucial for merchants to ensure assurance quality (Hsieh et al., 2012). The assurance or trust is also an important element of a service quality and is necessary to build in lasting connection in the CE process (Bowden, 2009; VO et al., 2020). Previous researches state that trust is a critical factor influencing CE conduct (Roy et al., 2018; Thakur, 2018; Qasim et al., 2024). As an example, unless the private data belongs to them is safe, clients will not be able to access their accounts, express their opinions publicly, and send recommendations regarding certain goods or enterprises on the Internet.

H3: Assurance quality has positive impact on customer engagement.

Vividness and Customer Engagement

Colourful pages of a web page could boost CE and trust because they trigger the mental consumption of data making the consumers encompass the former knowledge they could have about products, service, companies, and buying process (Chun and Lee, 2016; Yim et al., 2017; Khan et al., 2023). Yousaf et al. (2020) considered the vividness of social networking sites with a particular focus on the number and quality of available audio-visual materials that are offered. They argued that, through elaboration-likelihood model (ELM), when the consumers are processing information on the net, vividness, encourages them to focus on the functional text in the message. Customers are interested in this message-centrality, which can also increase CE and confidence (Agrawal et al., 2018; Lee and Hsieh, 2019; Arshad et al., 2022). Prior research by Vazquez (2020) demonstrated that digital engagement is positively impacted by perceived content vividness.

H4: Vividness has positive impact on customer engagement.

Novelty and Customer Engagement

According to scholars, novelty is the state of being unique, different, and creative (Massetti, 1996). By merging the real and computer-generated creations, augmented reality (AR) bargains clients a continuous and characteristic experience, with the potential to discover fresh joy and excitement every time the feature is utilized. AR content can be presented using manuscript, pictures, cinemas, and other simulated items (Javornik, 2016; Chen et al., 2022; Hayat et al., 2022). Every time the user uses an augmented reality feature, due to the extensive and profound connections between the actual and digital realms, kids are probably going to encounter new stimuli. Accordingly, novelty does not relate to the "newness" of augmented reality; rather, it refers to the new, unique, personalized, and creative content (stimuli) that is shown on the augmented reality screen each time (Wilson & McLean, 2019). Additionally, for the convenience of customers, the screen displays comprehensive product information. The augmented reality application's distinct novelty might boost user performance, encourage creation browsing, and inspire purchasing. As a result, it increases interactivity and lets people personalize content to their preferences (Chen et al., 2022).

H5: Novelty has positive impact on customer engagement.

Interactivity and Customer Engagement

Organizational and psychological research has long shown a connection between participation and engagement (Bakker et al., 2008; Kanungo, 1982). In conclusion, novelty can be used to gauge how unique an encounter is for users because the most important way that novelty affects how information is processed is by drawing attention to it in the audience (Kover and James 1993; Lang 1992; Thorson and Lang 1992; Arshad et al., 2024). The most significant way that novelty influences how material is digested is through the attention it garners from its audience (Kover and James 1993; Thorson and Lang 1992; Zahra et al., 2024). As a result, this study considers novelty as an experience quality that is also closely linked to customer engagement. Prior research by Utammi et al. (2022) demonstrated that interaction improves consumer engagement.

H6: Interactivity has positive impact on customer engagement.

Customer Engagement and Purchase Decision

Customer engagement is an emotional state that has a degree of intensity and is crucial to the process of trading goods or services, claim Saputra & Fadhilah (2022). According to Zheng et al. (2022), customer engagement is defined as the result of specific client motivation, such as referrals, suggestions, interactions between customers, writing evaluations, blog posts, and other comparable conduct, and is a display of consumer behaviour towards brands (companies) outside of purchases or buying activities. Customer engagement indicators are broken down by Handayani and Sari (2022) into five categories: (1) identification, (2) attention, (3) absorption, (4) communication, and (5) passion.

According to Sukma et al. (2022), CE is a process that indirectly includes associated customers in research, alternative evaluation, and brand purchase decisions. Additionally, ties with the organization will be built through physical, cognitive, and emotional participation, according to customer engagement (Panjaitan, 2022).

Because it will create a solid relationship between customers and businesses that influence their purchase decisions, customer engagement is crucial for businesses. The seven phases of client engagement are relationship, communication, happiness, retention, dedication, campaigning, and Engagement, according to Clarence and Keni (2022). According to earlier studies, consumer interaction affects their choice to buy (Syalsabila and Hermina, 2023; Ardiyansyah and Febrianti, 2022; Arshad, 2022).

H7: Customer engagement has positive impact on purchase decision.

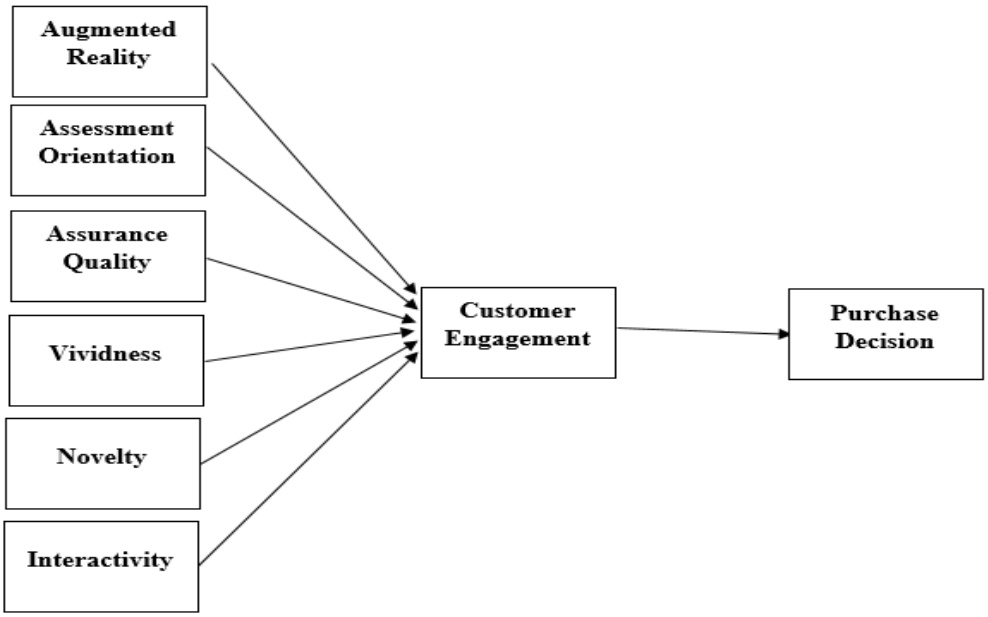

Figure 1
Framework

3 Methodology

Research Design

The intention of this exploration is to scrutinize the impression of augmented reality on purchase decision through mediating role of customer engagement. This investigation is quantitative in its nature and use questionnaire for data collection. The intention of this investigation is to test the association between hypothesized models. Population of this investigation consists of online consumers in Pakistan who have used AR features in online shopping websites. To achieve these goals, data from business followers was gathered using an online survey created and disseminated via Google Forms. It is beneficial to use online questionnaires for data collecting since they are not restricted to a particular location, are more economical and time-efficient, and provide replies more quickly (Wright, 2005). Non-probability purposive sampling is used to target users who have experience with AR in online shopping. The sample size for this research is considered 350 individuals but we collect 280 responses.

Instrument Development

A questionnaire was utilized to collect data for this experimental study. Our survey was divided into two parts: a nominal scale for the first part and a seven-point Likert scale for the second. The survey's first portion collected demographic information about online shoppers, including gender, age, education level, and city of residence. 12 items of assessment orientation was implemented from previous examination of Kruglanski et al. (2000). 5 items of assurance quality was adopted from earlier investigation of Hossain et al. (2020). 6 items was adopted to measure vividness from earlier investigation of Babin and Burns (1998). 4 Items of novelty was implemented from past inquiry of Yim et al. (2012). 4 items of interactivity was implemented from earlier investigation of Wu (2005). 3 items of customer engagement was adopted from Barasch et al. (2017). 5 items was implemented from past exploration of Shareef et al. (2008) to measure purchase decision.

4 Data Analysis

Demographics

The vast majority of responders (193 individuals, or 69% of the total) were men and (87 individuals or 31% of the total) were women's. Results show that 155 respondents 55% of the total population are in the age group of 18-28, 65 individuals 23% of the total sample are in the age group of 19-29, 55 individuals 20% of the total sample are in the age group of 30-40, 41 individuals 15% of the total sample are in the age group of 41-51, and 29 individuals 10% of the total sample are in the age group of 52 and above. Results show that 57 individuals 20.35% of the total population holds matric degree, 80 individuals 29% of the total population holds intermediate degree, 120 individual's 43% of the total population holds bachelor's degree and 23 individuals 8% of the total sample holds M.Phil./PhD. Results show that 24 individuals 9% of the total population are from Rajanpur District, 92 respondents 33% of the total sample are from Dera Ghazi Khan, 31 respondents 11 of the total population are from Muzaffargarh, 47 individuals 17% of the total population are from Multan, 21 individuals 7% of the total sample are from Lodhran, 65 participants 23% of the study are from Bahawalpur

Table 1

Demographics

Category	Sub-category	Frequency (n)	Percentage (%)
Gender	Male	193	69%
	Female	87	31%
Age Group	18–28	155	55%
	29–40	55	20%
	41–51	41	15%
	52 and above	29	10%
Education	Matric	57	20.35%
	Intermediate	80	29%
	Bachelor's	120	43%
	M.Phil./PhD	23	8%
Location	Rajanpur	24	9%
	Dera Ghazi Khan	92	33%
	Muzaffargarh	31	11%
	Multan	47	17%
	Lodhran	21	7%
	Bahawalpur	65	23%

Measurement Model Assessment

Assessing the dependability of a measurement model is the first step in the evaluation process. Cronbach's alpha is used to assess validity and reliability, while composite reliability is used to gauge the internal consistency of the measurement model. When the value is nearer 1 or more, the degree of internal consistency is greater (Hair et al., 2019). Internal consistency is best evaluated using

composite reliability, where values greater than 0.7 are considered significant. All of the reflective structures have Cronbach alpha values greater than 0.7, as shown in Table 2, and their composite reliability is likewise greater than 0.7. The concept is therefore internally consistent. It demonstrates that every indicator for every build measures that construct consistently. The concept accounts for more than half of the indicator's variation, as shown by the estimated AVE values being higher than 0.50 (Hamaker et al., 2018). More mistakes are present in the indicators when the AVE value is less than 0.50, and less errors are present when the AVE value is larger than 0.50. Table 2's AVE values are higher above the 0.50 acceptable level.

Table 2

Measurement Model Assessment

	Cronbach's Alpha	Composite Reliability	Average variance Extracted
Augmented Reality	0.810	0.824	0.630
Assessment Orientation	0.790	0.808	0.611
Assurance Quality	0.824	0.831	0.626
Vividness	0.854	0.866	0.559
Novelty	0.825	0.834	0.663
Interactivity	0.862	0.850	0.623
Customer Engagement	0.851	0.872	0.638
Purchase Decision	0.833	0.841	0.617

Correlation Analysis

Cohen et al. (2014) state that a correlation is considered weakened or low if it falls between 0.10 and 0.29, moderate if it falls between 0.30 and 0.49, and strong if it falls between 0.5 and 0.8. Augmented reality has positive linkage with assessment orientation (r= .51, P < .01), with assurance quality (r= .45, P < .01), with vividness (r= .53, P < .01), with novelty (r= .46, P < .01), with interactivity (r= .47, P < .01), with customer engagement (r= .42, P < .01), and with purchase decision (r= .45, P < .01). Assessment orientation has positive association with assurance quality (r= .46, P < .01), with vividness (r= .54, P < .01), with novelty (r= .41, P < .01), with interactivity (r= .42, P < .01), with customer engagement (r= .48, P < .01), and with purchase decision (r= .51, P < .01). Assurance quality has positive connection with vividness (r= .47, P < .01), with novelty (r= .39, P < .01), with interactivity (r= .40, P < .01), with customer engagement (r= .42, P < .01), and with purchase decision (r= .52, P < .01). Vividness has positive impact on novelty (r= .47, P < .01), with interactivity (r= .57, P < .01), with customer engagement (r= .56, P < .01), and with purchase decision (r= .51, P < .01). Novelty has positive relationship with interactivity (r= .48, P < .01), with customer engagement (r= .48, P < .01), and with purchase decision (r= .46, P < .01). Interactivity has positive correlation with customer engagement (r= .42, P < .01), and with purchase decision (r= .53, P < .01). Customer engagement has positive correlation with purchase decision (r= .43, P < .01).

Table 3

Correlation Analysis

Variable	1	2	3	4	5	6	7	8
AR	1							
AO	0.518	1						
AQ	0.452	0.462	1					
VIV	0.534	0.542	0.478	1				
NOV	0.467	0.416	0.390	0.476	1			

INT	0.472	0.420	0.404	0.570	0.481	1		
CE	0.428	0.480	0.429	0.561	0.480	0.428	1	
PD	0.455	0.510	0.527	0.516	0.466	0.532	0.433	1

Structural Equation Model

In this work, a SEM was used to examine the proposed connections of the assessment. Because SEM identifies estimating systems in an essential manner using all model fit files, it was an amazing estimating method that helped determine the model's meaning (James et al., 2006). The best method for figuring out if the sample information could shed light on the theoretical framework is the SEM (Santos et al., 2021). SEM used the greatest likelihood strategy to analyze the study model. The structural model was utilized to assess the suggested model's validity, and path evaluation was employed to determine the connections between the components. According to Tucker and Lewis (1973), the TLI calculates the relative decrease in misfit for each degree of freedom. Tucker and Lewis (1973) first established this index in the area of exploratory factor analysis. It was then modified for use in covariance structure analysis by Bentler and Bonett (1980), who named it the non-normed fit index. Because its value might occasionally be negative or exceed 1, this index is non-normed. According to Bentler and Bonett (1980), a TLI >.90 denotes a suitable match. The relative improvement in fit between the baseline and posited models is measured by the CFI (Bentler, 1990). The CFI is a normed fit index in that it has a range of 0 to 1 where bigger values indicate a better fit. To get a good fit CFI.95 is the most frequently applied criterion (Hu & Bentler, 1999; West et al., 2012).

A lot of goodness-of-fit indices had been used to prove the goodness-of-fit of the model, including 330.50 chi2 /df (1.57), CFI (0.95), TLI (0.92), and SRMR (0.053). The indices described above demonstrate a close relationship between the suggested framework and the experimental data. The route coefficients for the suggested relationships were also looked at, in addition to the variance mentioned for the external components (R2). The standardized path coefficient explained 38% of the variation in customer involvement and revealed a positive correlation between self-reported augmented reality and customer engagement (β =.29, R2 =.380; P =.000). Hypothesis 1 was therefore validated. The standardized path coefficient explained 38% of the variation in customer involvement and revealed a positive correlation between self-reported evaluation orientation and customer engagement (β =.41, R2 =.380; P =.000). Hypothesis 2 was therefore validated. The standardized path coefficient explained 38% of the variation in customer engagement and revealed a positive correlation between self-reported assurance quality and customer engagement (β =.37, R2 =.380; P =.000). Hypothesis 3 was therefore validated. The standardized path coefficient explained 38% of the variation in customer engagement and revealed a positive correlation between self-identified vividness and customer engagement (β =.44, R2 =.380; P =.000). Hypothesis 4 was therefore validated. The standardized path coefficient explained 38% of the variation in customer engagement and revealed a positive correlation between self-reported novelty and customer engagement (β =.24, R2 =.380; P =.000). Hypothesis 5 was therefore validated. The standardized path coefficient explained 38% of the variation in customer engagement and revealed a positive correlation between self-identified interactivity and customer engagement (β =.32, R2 =.380; P =.000). Hypothesis 6 was therefore validated. The standardized path coefficient explained 29% of the variation in purchase decisions and revealed a positive correlation between expressed customer engagement and purchase decisions (β =.39, R291; P =.000). Hypothesis 7 was therefore validated.

Table 4

Hypothesis Results

Hypo. No	IVs	DVs	(β)	R2	T	P**	Results
H1	AR	CE	.293	.380	11.345	.000	Established
H2	AO	CE	.416	.380	7.435	.000	Established
H3	AQ	CE	.378	.380	9.457	.000	Established
H4	VIV	CE	.447	.380	8.171	.000	Established
H5	NOV	CE	.248	.380	3.674	.000	Established
H6	INT	CE	.323	.380	9.542	.000	Established
H7	CE	PD	.396	.291	13.535	.000	Established

Discussions

Augmented reality has positive impact on customer engagement. Earlier investigations also confirmed that augmented reality has positive association with customer engagement (McLean and Wilson, 2019; Ganesan and Kumar, 2024; Lin and Huang, 2024; Enyejo et al., 2024; Khan, 2024). Assessment orientation has positive linkage with customer engagement. Previous research proved that assessment orientation has positive impact on customer engagement (Jessen et al., 2020; Ali et al., 2023). Assurance quality has positive connection with customer engagement. This result supports the idea supported by earlier research that customer engagement is driven by trust, as evidenced by assurance quality (Kosiba et al., 2018; Roy et al., 2018; Thakur, 2018; Gao and Huang, 2021; Iqbal et al., 2023). Vividness has positive association with customer engagement. Earlier investigations verified that vividness has positive linkage with engagement (Vazquez, 2020; Yousaf et al., 2021; Kim et al., 2021; Khan and Danya, 2022). Novelty has positive impact on customer engagement. Previous inquiries verified that novelty has positive linkage with customer engagement (Wilson and McLean, 2019; Arghashi and Yuksel, 2022; Diaa, 2022; Ramzan et al., 2023). Interactivity has positive influence on customer engagement. The previous studies confirm the fact that interactivity enhances customer engagement (Soares et al., 2019; Alalwan et al., 2020; Bozkurt et al., 2021; Utami et al., 2021; Bilal et al., 2023). There is positive relation between Customer Engagement and purchase decision. Previous studies had affirmed that purchase decision has positive relationship with customer engagement (Ardiyansyah and Febrianti, 2022; Syalsabila and Hermina, 2023; Mavilinda et al., 2023; Ziaullah et al., 2023; Shafiq et al., 2023).

5 Conclusion

This paper was an attempt to consider the effects of augmented reality on customer purchase decision with customer engagement as a mediation variable. The research employed the methodology of quantitative research and a structured questionnaire to gather data among the Pakistani population of online shoppers that had an experience of using augmented reality features during their online buying process, as part of the online shopping industry. The questionnaire was shared through Google forms which made its delivery wider as well as cost effective and the collection of data in time. The occurrence of this study helps to unravel the impact of AR in making purchase preferences with a particular point focus on the mediating nature of the engagement of customers. This is an indication that companies, which incorporate AR technologies, are supposed to consider not only the technological dimensions but also how to comprehensively involve customers so that they will make better purchase decision. The study can offer helpful information to marketers and e-commerce sites in Pakistan to make use of AR to stimulate purchase decision.

5.1 Practical Implications

On the one hand, the beneficial effect of the inclusion of augmented reality in customer engagement demonstrates the necessity of online retailers to use and implement AR issues in their online platform. Brand can use AR-based product visualization like VR try-ons or 3D views, allowing it to provide

more engaging and fascinating client experiences to attract and retain them. Second, the positive relationship between assessment orientation and customer engagement indicates the evaluated retailers have to pay more attention to the provision of the information that would be detailed, transparent and comparative to assist customers in the decision-making process. Because the assessment-focused consumers are more likely to ensure that they have considered every option, business opportunities will be best utilized with the option of the AR visualization of the product, the product comparison machinery, detailed features and specifications, and customer feedback. Also, giving out plain rules of returning, references of professionals, and engaging-to-learn guidelines may create the preferred credibility and stimuli of greater engagement. Through aligning online shopping experience with consumer evaluative behavior, companies are in position of enhancing consumer engagement and maximize chances of purchase decision. Third, well-known positive partnership between the quality of assurances and customer involvement underline suspicious statements that online shops need to be built up on trustfulness and trustworthiness. Businesses can also attract customer by maximizing on attributes of reliability in their platforms by providing appropriate modes of payments, data privacy, transparent returns policy, and customer service. Customer confidence is also boosted by integration of AR features that will work conveniently and deliver realistic representations of products. Consumer confidence regarding quality and safety of their online shopping processes is likely to motivate consumers and encourage them to interact with the platform actively, learning more about the products and prepare to make purchasing decisions more confidently. Fourth, the positive relation between vividness and customer engagement implies that online retailers will have to be focused on the creation of rich, eye-pleasing and immersive content to attract and losing the attention of customers. High resolution photos, in-depth description of 3D products and interactive AR usage have the capability of creating a much strong example of sensorial pleasures of online purchasing. Businesses have a chance to create a deeper emotional connection with the audience by letting customers explore the products in a realistic and interactive manner. Good, three-dimensional-looking visualizations of the computer environment do not only make it more enjoyable, but also incentive the customer to spend more time communicating with the environment, which eventually leads to a higher possibility of purchase. Fifth, the positive correlation between the AR novelty and customer engagement implies that businesses need to ensure there are always new, fresh and unique AR experiences in place to ensure the interest and engagement of customers. Novelty: Novelty attracts the attention of the consumers distracting them with something new or different than the normal online shopping process. This can be capitalized by online retailers by distributing new features made in AR more frequently, pioneering imaginative virtual product walks or introducing AR game-esque activities that freshen users with new and time-sensitive AR experiences, businesses can maintain their sites active, increase visit rates, and build the emotional bond between the customer and the brand, which inevitably contributes to increased levels of enthusiasm and decision to buy. Sixth, this great immediate positive influence of augmented reality interactivity on customers involvement implies, that online retailers need to lay emphasis to making the best highlights interactive AR experiences which enhances the desire of users to become more involved. To enhance the user experience, online stores provide more opportunities using product features like virtual try-ons, items customizing, and real-time interactions with a 3D model that make the shopping process more engaging and focused on specific needs. Through the ability to control, interact with products in a very kinetic manner, they allow customers to learn about them in a highly engaging manner and businesses can achieve greater customer involvement, satisfaction, and attachment, which then leads them to greater engagement and higher success of purchase decision. One of the strategies that can thus be used to improve customer engagement on-line is investing in interactive tools that are easy to use and responsive using AR. Seventh, that customer engagement has a positive influence regarding participating in the purchase decision-making process prevents the possibility of not going into more detail regarding the importance of businesses engaging continuously and accepting strongly with their customer via the online selling process. Promoting interactive, customized, and emotionally impactful experiences with the help of such tools as AR,

extensive content and dynamic communication companies will be able to increase customer engagement, develop a sense of trust and the desire to be committed to their services or specific products.

5.2 Limitations and Future Research Directions

This investigation has a number of drawbacks that should be noted despite its benefits. First, the research relies on a questionnaire approach using self-reported data collected through online questionnaires, which may be subject to response biases such as social desirability or inaccurate recall. Second, the sample is limited to online consumers in Pakistan who have experience with augmented reality in shopping, which restricts the generalizability of the findings to other regions or consumer groups. Thirds, the cross-sectional design of the study limits the ability to establish casual relationships between augmented reality, customer engagement and purchase decisions

Future research could address these limitations by employing longitudinal or experimental designs to better capture causal effects and changes over time. Expanding the study to diverse geographic and cultural contexts would enhance the generalizability and offer comparative insights. Additionally, incorporating qualitative methods, such as interview or focus groups, could provide deeper understanding of consumer's motivations, such as customer satisfaction, perceived risk, or technology readiness, to further unpack the dynamics between AR and purchase decision. Finally, investigation specific product categories or different online platforms could yield more nuanced implications for various industry sector

References

Abbas, Q., Ali, M. A., & Iqbal, S. (2023). Going green on social media: exploring the effect of firm-generated content on brand trust and purchase decision in Pakistan with a focus on environmental concern. *International Journal of Social Science & Entrepreneurship, 3*(3), 187-207.

Alalwan, A. A., Algharabat, R. S., Baabdullah, A. M., Rana, N. P., Qasem, Z., & Dwivedi, Y. K. (2020). Examining the impact of mobile interactivity on customer engagement in the context of mobile shopping. *Journal of Enterprise Information Management, 33*(3), 627-653.

ALi, T. Y., Iqbal, S., Ali, R., & Khan, S. S. (2023). Big data analytics' influence on competitive advantage: mediating green creativity and green commitment, moderated by individual green values and green psychological climate. *The Asian Bulletin of Green Management And Circular Economy, 3*(1), 71-92.

Alimamy, S., Deans, K., & Gnoth, J. (2018). An empirical investigation of augmented reality to reduce customer perceived risk. In P. Rossi & N. Krey (Eds.) Marketing transformation: Marketing practice in an ever-changing world. AMSWMC 2017. Developments in marketing science: *Proceedings of the Academy of Marketing Science (pp. 127–135).* Cham: Springer.

Ardiyansyah, R., & Febrianti, R. A. M. (2022). Understanding the driver of customer purchase decision: The role of customer engagement and brand attachment in Batik Products. Fair Value: *Jurnal Ilmiah Akuntansi dan Keuangan, 5*(4), 1979-1985.

Arghashi, V. (2022). Shopping with augmented reality: How wow-effect changes the equations!. *Electronic Commerce Research and Applications*, 54, 1-19.

Arghashi, V., & Yuksel, C. A. (2022). Interactivity, inspiration, and perceived usefulness! how retailers' AR-apps improve consumer engagement through flow. *Journal of Retailing and Consumer Services,* 64, 1-20.

Arshad, H. M. A. (2022). An analysis of social media marketing on consumer brand engagement and repurchase intention. *SMART Journal of Business Management Studies, 1*(3), 35-47.

Arshad, H. M. A., Mehmood, S., & Hayyat, A. (2022). Does impulse buying behavior mediate the relationship between social network marketing and customer satisfaction? Evidence from Pakistan. *Journal of Business & Economics (JBE), 14*(2), 96-107.

Arshad, H. M. A., Ullah, M. Z., Shafiq, M. A., Saad, H. G. N., Khan, M. A., & Zahra, A. (2024). How does Service characteristics and corporate social responsibility matters in customer retention and bank reputation: An evidence from the banks of Pakistan. *Journal for Social Science Archives, 2*(2), 14-35.

Ausat, A. M. A., Shafiq, M. A., Judijanto, L., & Azzaakiyyah, H. K. (2024). Transformational leadership, psychological safety, and ICT competencies: Effects on employee performance. *Jurnal Pekommas, 9*(2), 323-336.

Azzaakiyyah, H. K., Wanof, M. I., Fitri, W. S., Ausat, A. M. A., & Shafiq, M. A. (2024). Transformation of Social Media and Information Technology in SMEs: The critical role of industry-academia partnership in human resource development. *Apollo: Journal of Tourism and Business, 2*(3), 248-255.

Babin, L. A., & Burns, A. C. (1998). A modified scale for the measurement of communication-evoked mental imagery. *Psychology & Marketing, 15*(3), 261-278.

Badriyah, N., Ausat, A. M. A., Shafiq, M. A., Wafik, D., & Mazil, M. M. (2025). Unlocking job performance: How servant leadership, psychological safety, and organizational justice drive success through organizational trust. *Jurnal Aplikasi Bisnis dan Manajemen, 11*(2), 404-404.

Bajpai, A., & Islam, T. (2022). Impact of augmented reality marketing on customer engagement, behavior, loyalty, and buying decisions. *Cardiometry*, 23(8), 545–553.

Bakker, A. B., Schaufeli, W. B., Leiter, M. P., & Taris, T. W. (2008). Work engagement: An emerging concept in occupational health psychology. *Work & Stress, 22*(3), 187-200.

Barasch, A., Zauberman, G., & Diehl, K. (2018). How the intention to share can undermine enjoyment: Photo-taking goals and evaluation of experiences. *Journal of Consumer Research, 44*(6), 1220-1237.

Batat, W. (2021). How augmented reality (AR) is transforming the restaurant sector: Investigating the impact of "Le Petit Chef" on customers' dining experiences. *Technological Forecasting and Social Change*, *172*, 1-13.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107, 238–246.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*, 588–606.

Bilal, A., Siddique, M., & Shafiq, M. A. (2023). An Analysis of social media marketing in developing customer engagement and customer loyalty: The moderating role of brand trust. *Journal of Namibian Studies: History Politics Culture*, *33*, 5640-5664.

Boston Consulting Group (2018). Augmented reality: Is the camera the next big thing in advertising. https://www.bcg.com/de-de/publications/2018/augmented-reality-iscamera-next-big-thing-advertising.aspx

Bowden, J. L. H. (2009). The process of customer engagement: A conceptual framework. *Journal of Marketing Theory and Practice, 17*(1), 63-74.

Bozkurt, S., Gligor, D. M., & Babin, B. J. (2021). The role of perceived firm social media interactivity in facilitating customer engagement behaviors. *European Journal of Marketing, 55*(4), 995-1022.

Chen, S. C., Chou, T. H., Hongsuchon, T., Ruangkanjanases, A., Kittikowit, S., & Lee, T. C. (2022). The mediation effect of marketing activities toward augmented reality: the perspective of extended customer experience. *Journal of Hospitality and Tourism Technology, 13*(3), 461-480.

Chung, N., Han, H., & Joun, Y. (2015). Tourists' intention to visit a destination: The role of augmented reality (AR) application for a heritage site. *Computers in Human Behavior*, 50, 588-599.

Chylinski, M., Heller, J., Hilken, T., Keeling, D. I., Mahr, D., & de Ruyter, K. (2020). Augmented reality marketing: A technology-enabled approach to situated customer experience. *Australasian Marketing Journal, 28*(4), 374-384.

Clarence, C., and Keni, K. (2022). The Prediction of purchase intention based on digital marketing, customer engagement, and brand preference. In *Tenth International Conference on Entrepreneurship and Business Management 2021 (ICEBM 2021) (pp. 481- 486)*. Atlantis Press.

Cohen, P., West, S. G., & Aiken, L. S. (2014). *Applied multiple regression/correlation analysis for the behavioral sciences*. Psychology press.

Daassi, M., & Debbabi, S. (2021). Intention to reuse AR-based apps: The combined role of the sense of immersion, product presence and perceived realism. *Information & Management, 58*(4), 1-12.

Dacko, S. G. (2017). Enabling smart retail settings via mobile augmented reality shopping apps. *Technological Forecasting and Social Change*, 124, 243–256. https://doi.org/10.1016/j.techfore.2016.09.032.

de Ruyter, K., Heller, J., Hilken, T., Chylinski, M., Keeling, D. I., & Mahr, D. (2020). Seeing with the customer's eye: Exploring the challenges and opportunities of AR advertising. *Journal of Advertising, 49*(2), 109-124.

Diaa, N. M. (2022). Investigating the effect of augmented reality on customer brand engagement: The mediating role of technology attributes. *The Business & Management Review, 13*(2), 356-375.

Enyejo, J. O., Obani, O. Q., Afolabi, O., Igba, E., & Ibokette, A. I. (2024). Effect of Augmented Reality (AR) and Virtual Reality (VR) experiences on customer engagement and purchase behavior in retail stores. *Magna Scientia Advanced Research and Reviews, 11*(2), 132-150.

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

Ganesan, M., & Kumar, B. (2024). Augmented reality: The key to unlock customer engagement potential. *Marketing Intelligence & Planning, 42*(6), 976–1009.

Gao, M., & Huang, L. (2021). Quality of channel integration and customer loyalty in omnichannel retailing: The mediating role of customer engagement and relationship program receptiveness. *Journal of Retailing and Consumer Services*, 63, 1-11.

Grewal, D., Noble, S. M., Roggeveen, A. L., & Nordfalt, J. (2020). The future of in-store technology. *Journal of the Academy of Marketing Science*, 48, 96-113.

Gul, R., Hussain, M., & Javaid, M. Q. (2023). Influence of social media marketing in development of customer trust and satisfaction through the moderating role of electronic word of mouth. *Journal of Social Sciences Review, 3*(1), 623-638.

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

Hamaker, E. L., Asparouhov, T., Brose, A., Schmiedek, F., & Muthén, B. (2018). At the frontiers of modeling intensive longitudinal data: Dynamic structural equation models for the affective measurements from the COGITO study. *Multivariate Behavioral Research, 53*(6), 820-841.

Han, D. I., tom Dieck, M. C., & Jung, T. (2018). User experience model for augmented reality applications in urban heritage tourism. *Journal of Heritage Tourism, 13*(1), 46–61.

Handayani, S. Z., and Sari, A. Y. (2022). The role of social media in building shopping value, customer trust, and customer engagement. *Operations Management and Information System Studies, 2*(1), 48-59.

Hayat, A., Ali, H., & Mehmood, S. (2022). An examination of CSR's role in fostering organizational commitment and employee performance. *Journal of Business and Environmental Management, 1*(1), 63-78.

Heller, J., Chylinski, M., de Ruyter, K., Mahr, D., & Keeling, D. I. (2019b). Touching the untouchable: Exploring multi-sensory augmented reality in the context of online retailing. *Journal of Retailing, 95*(4), 219–234.

Higgins, E. T., & Scholer, A. A. (2009). Engaging the consumer: The science and art of the value creation process. *Journal of Consumer Psychology, 19*(2), 100–114.

Hilken, T., De Ruyter, K., Chylinski, M., Mahr, D., & Keeling, D. I. (2017). Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences. *Journal of the Academy of Marketing Science*, 45, 884-905.

Hilken, T., Heller, J., Chylinski, M., Keeling, D. I., Mahr, D., & de Ruyter, K. (2018). Making omnichannel an augmented reality: The current and future state of the art. *Journal of Research in Interactive Marketing, 12*(4), 509–523.

Hilken, T., Keeling, D. I., de Ruyter, K., Mahr, D., & Chylinski, M. (2020). Seeing eye to eye: Social augmented reality and shared decision making in the marketplace. *Journal of the Academy of Marketing Science, 48*(2), 143–164.

Hinsch, C., Felix, R., & Rauschnabel, P. A. (2020). Nostalgia beats the wow-effect: Inspiration, awe and meaningful associations in augmented reality marketing. *Journal of Retailing and Consumer Services*, 53, 1-11.

Hollebeek, L. D., Srivastava, R. K., & Chen, T. (2019). SD logic–informed customer engagement: Integrative framework, revised fundamental propositions, and application to CRM. *Journal of the Academy of Marketing Science, 47*(1), 161–185.

Hossain, T. M. T., Akter, S., Kattiyapornpong, U., & Dwivedi, Y. (2020). Reconceptualizing integration quality dynamics for Omni channel marketing. *Industrial Marketing Management*, 87, 225-241.

Hsieh, Y. C., Roan, J., Pant, A., Hsieh, J. K., Chen, W. Y., Lee, M., & Chiu, H. C. (2012). All for one but does one strategy work for all? Building consumer loyalty in multi-channel distribution. *Managing Service Quality: An International Journal, 22*(3), 310-335.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1-55.

Huang, T. L., & Chung, H. F. (2024). Impact of delightful somatosensory augmented reality experience on online consumer stickiness intention. *Journal of Research in Interactive Marketing*, 18(1), 6–30.

Iqbal, S., Kumar, N., & Khan, F. A. (2023). Corporate social responsibility and brand loyalty in punjab's banking sector: exploring the mediating role of corporate branding. *Pakistan Journal of Humanities and Social Sciences, 11*(2), 853-863.

James, F. (2006). Statistical methods in experimental physics. World Scientific Publishing Company. Singapore

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

Jessen, A., Hilken, T., Chylinski, M., Mahr, D., Heller, J., Keeling, D. I., & de Ruyter, K. (2020). The playground effect: How augmented reality drives creative customer engagement. *Journal of Business Research*, 116, 85-98.

Kanungo, R. N. (1982). Measurement of job and work involvement. *Journal of Applied Psychology, 67*(3), 341–349.

Khalid, M. B., Rehman, Z. U., Shafiq, M. A., Zahra, A., & Ullah, M. S. (2024). Influence of Social Media Marketing Activities on Purchase Decision Through the mediating role of Brand Trust, Brand Image and Brand Experience. (2024). *Pakistan Journal of Law, Analysis and Wisdom, 3*(10), 78-102.

Khan, M. M. A., e Ali, M. S., & Asim, S. (2023). Assessment of service quality and innovation in developing customer loyalty; the mediating role of customer commitment and satisfaction. *Pakistan Journal of Humanities and Social Sciences, 11*(1), 243-257.

Khan, M. S. (2024). Assessment of corporate social responsibility on customer loyalty through moderating role of servant leadership and customer commitment: evidence from telecommunication industry. *Journal of Tourism, Hospitality, and Services Industries Research (JTHS), 4*(01), 22-43.

Khan, N., & Danya, A. (2022). An analysis of integration management in developing project performance-evidence from Pakistan. *Journal of Economics, Management & Business Administration, 1*(2), 1-14.

Kim, J. H., Kim, M., Park, M., & Yoo, J. (2021). How interactivity and vividness influence consumer virtual reality shopping experience: the mediating role of telepresence. *Journal of Research in Interactive Marketing, 15*(3), 502-525.

Kim, J. H., Kim, M., Park, M., & Yoo, J. (2023). Immersive interactive technologies and virtual shopping experiences: Differences in consumer perceptions between augmented reality (AR) and virtual reality (VR). *Telematics and Informatics*, *77*, 1-15.

Kosiba, J. P. B., Boateng, H., Okoe Amartey, A. F., Boakye, R. O., & Hinson, R. (2018). Examining customer engagement and brand loyalty in retail banking: The trustworthiness influence. *International Journal of Retail & Distribution Management, 46*(8), 764-779.

Kousar, T., Ali, M. A., & Abbas, Q. (2023). Enhancing E-Business Success: Unraveling the Effect of Customer Engagement on Customer Citizenship Behavior and Purchase Decisions in Pakistan. *Journal of Asian Development Studies, 12*(3), 79-96.

Kruglanski, A. W., Thompson, E. P., Higgins, E. T., Atash, M. N., Pierro, A., Shah, J. Y., & Spiegel, S. (2018). To "do the right thing" or to "just do it": Locomotion and assessment as distinct self-regulatory imperatives. In *The motivated mind* (pp. 299-343). Routledge.

Lee, C. T., & Hsieh, S. H. (2019). Engaging consumers in mobile instant messaging: the role of cute branded emoticons. *Journal of Product & Brand Management, 28*(7), 849-863.

Leung, W. K., Chang, M. K., Cheung, M. L., & Shi, S. (2023). VR tourism experiences and tourist behavior intention in COVID-19: an experience economy and mood management perspective. *Information Technology & People, 36*(3), 1095-1125.

Lin, K. Y., & Huang, T. K. (2024). Shopping in the digital world: How augmented reality mobile applications trigger customer engagement. *Technology in Society*, *77*, 1-10.

Liu, E., Albaheth, H. E., & Shafiq, M. A. (2025). Strategic directions for renewable energy in China: Analyzing the transition from fossil fuels to dirty free technologies. *Energy Strategy Reviews*, *59*, 1-11.

Liu, R., Balakrishnan, B., & Saari, E. M. (2024). The impact of augmented reality (AR) technology on consumers' purchasing decision processes. *Frontiers in Business, Economics and Management, 13*(2), 181–185.

Marc, R., Korbel, J., Nannan, X., Meywirth, S., Zarnekow, R. and Hamari, J. (2023), "AR in interactive marketing: state-of-the-art and emerging trends", *The Palgrave Handbook of Interactive Marketing*, pp. 301-327.

Massetti, B. (1996). An empirical examination of the value of creativity support systems on idea generation. *MIS Quarterly*, 83-97.

Mavilinda, H. F., Putri, Y. H., & Nazaruddin, A. (2023). Is Storytelling Marketing Effective in Building Customer Engagement and Driving Purchase Decisions? *Jurnal Manajemen Bisnis, 14*(2), 274-296.

McLean, G., & Wilson, A. (2019). Shopping in the digital world: Examining customer engagement through augmented reality mobile applications. *Computers in Human Behavior*, 101, 210-224.

Mehta, R., & Dahl, D. W. (2019). Creativity: Past, present, and future. *Consumer Psychology Review, 2*(1), 30–49.

Negm, E. (2023). Intention to use Internet of Things (IoT) in higher education online learning–the effect of technology readiness. *Higher Education, Skills and Work-Based Learning, 13*(1), 53-65.

Negm, E. M. (2024). Consumers' acceptance intentions regarding e-payments: a focus on the extended unified theory of acceptance and use of technology (UTAUT2). *Management & Sustainability: An Arab Review, 3*(3), 340-360.

Oh, J., Bellur, S., & Sundar, S. S. (2018). Clicking, assessing, immersing, and sharing: An empirical model of user engagement with interactive media. *Communication Research, 45*(5), 737–763.

Panjaitan, R. (2022). Mediating Role of Customer Engagement: Brand Image Enhancement from Social-Media Marketing. *Jurnal Maksipreneur: Manajemen, Koperasi, dan Entrepreneurship, 12*(1), 11-21.

Pascucci, F., Savelli, E., & Gistri, G. (2023). How digital technologies reshape marketing: evidence from a qualitative investigation. *Italian Journal of Marketing, 2023*(1), 27-58.

Poushneh, A., & Vasquez-Parraga, A. Z. (2017). Discernible impact of augmented reality on retail customer's experience, satisfaction and willingness to buy. *Journal of Retailing and Consumer Services*, 34, 229–234.

Qasim, H., Riaz, Z., Nawaz, Q., Raza, H., Arooj, A., & Khan, S. (2024). Impact of Service Quality, Patient Trust and Hospital Reputation on Patient Satisfaction-Evidence from Health Sector. *Center for Management Science Research, 2*(3), 310-324.

Ramzan, M., Faisal, M. M., & Iqbal, S. (2023). Exploring the relationship between green human resource management and green creativity: The moderating influence of green behavioral intention. *Pakistan Journal of Humanities and Social Sciences, 11*(1), 426-439.

Rauschnabel, P. A., Babin, B. J., tom Dieck, M. C., Krey, N., & Jung, T. (2022). What is augmented reality marketing? Its definition, complexity, and future. *Journal of Business Research*, 142, 1140-1150.

Rauschnabel, P. A., Felix, R., & Hinsch, C. (2019). Augmented reality marketing: How mobile AR-apps can improve brands through inspiration. *Journal of Retailing and Consumer Services*, 49, 43–53.

Riaz, Z., Shafiq, M. A., Gillani, S. H. A., & Yasin, N. (2023). The Influence of Justice Perception on Tax Compliance Behavior by the Mediating Influence of Social Support: An Empirical Investigation in *Pakistan. Review of Applied Management and Social Sciences, 6*(3), 583-596.

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

Roy, S. K., Balaji, M. S., Soutar, G., Lassar, W. M., & Roy, R. (2018). Customer engagement behavior in individualistic and collectivistic markets. *Journal of Business Research*, 86, 281-290.

Santos, P. M., & Cirillo, M. Â. (2023). Construction of the average variance extracted index for construct validation in structural equation models with adaptive regressions. *Communications in Statistics-Simulation and Computation, 52*(4), 1639-1650.

Saputra, G. G., and Fadhilah, F. (2022). The Influence of Live Streaming Shopping on Purchase Decisions through Customer Engagement on Instagram Social Media. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences, 5*(2), 12126-12137.

Scholz, J., & Duffy, K. (2018). We ARe at home: How augmented reality reshapes mobile marketing and consumer-brand relationships. *Journal of Retailing and Consumer Services*, 44, 11–23.

Scholz, J., & Duffy, K. (2018). We ARe at home: How augmented reality reshapes mobile marketing and consumer-brand relationships. *Journal of Retailing and Consumer Services*, 44, 11-23.

Scholz, J., & Smith, A. N. (2016). Augmented reality: Designing immersive experiences that maximize consumer engagement. *Business Horizons, 59*(2), 149–161.

Shafiq, M. A., Ziaullah, M., Abbas, Q., Ali, M. A., & Iqbal, S. (2023). Going green on social media: exploring the effect of firm-generated content on brand trust and purchase decision in Pakistan with a focus on environmental concern. *International Journal of Social Science & Entrepreneurship, 3*(3), 187-207.

Shahid, M. N., & Ahmad, B. (2024). Influence of Corporate Social Responsibility on Competitive Advantage Through the Mediating Role of Green Brand Image and Green Brand Love. In *Corporate Governance and CSR Strategies for Sustainability* (pp. 20-44). IGI Global.

Shareef, M. A., Kumar, U., and Kumar, V. (2008). Role of different electronic-commerce (EC) quality factors on purchase decision: A developing country perspective. *Journal of Electronic Commerce Research, 9*(2), 92-113.

Smink, A. R., Frowijn, S., van Reijmersdal, E. A., van Noort, G., & Neijens, P. C. (2019). Try online before you buy: How does shopping with augmented reality affect brand responses and personal data disclosure. *Electronic Commerce Research and Applications*, *35*, 1-10.

Smink, A. R., Van Reijmersdal, E. A., Van Noort, G., & Neijens, P. C. (2020). Shopping in augmented reality: The effects of spatial presence, personalization and intrusiveness on app and brand responses. *Journal of Business Research*, 118, 474-485.

Soares, J. C., Sarquis, A. B., Cohen, E. D., & Soares, T. C. (2019). Social media marketing communication: effect of interactivity and vividness on user engagement. *Revista Brasileira de Marketing, 18*(4), 244-268.

Srivastava, M., & Sinha, M. (2022). Will the marketing educators have intention to continue using game-based pedagogy post the COVID-19 Pandemic? *International Journal of Education and Development using Information and Communication Technology, 18*(2), 28-45.

Statista (2023), available at: www.statista.com/statistics/282453/mobile-augmented-reality-market-size/

Sukma, A. S., Sumarwan, I. U., and Najib, M. S. T. (2022). The effects of events, brand awareness, customer engagement on purchasing decisions: A literature review. *Accounting, Organization and Economics, 2*(1), 33-51.

Syalsabila, N., & Hermina, N. (2023). The interrelations of celebrity endorsement, social media use, and customer engagement in achieving customer purchase decision. *Jurnal Manajerial, 10*(01), 1-16.

Tang, C. M., & Chaw, L. Y. (2016). Digital literacy: A prerequisite for effective learning in a blended learning environment? *Electronic Journal of E-learning, 14*(1), 54-65.

Tarar, M. A., Shafiq, M. A., Ramzan, S., & Farooq, N. (2024). Role of social media platforms in dissemination of knowledge, ideas, and innovation among employees within governmental organizations-a sociological study in Southern Punjab. *The Critical Review of Social Sciences Studies, 2*(2), 96-114.

Thakkar, K. Y., Joshi, B. B., & Kachhela, P. P. (2023). Consumer engagement with augmented reality (AR) in marketing: Exploring the use of ar technology in marketing campaigns and its impact on consumer engagement, brand experiences, and purchase decisions. *Journal of Management Research and Analysis, 10*(2), 99–105.

Thakur, R. (2018). Customer engagement and online reviews. *Journal of Retailing and Consumer Services,* 41, 48-59.

Thorson, E., & Lang, A. (1992). The effects of television video graphics and lecture familiarity on adult cardiac orienting responses and memory. *Communication Research*, 19(3), 346-369.

Tucker, L. R., & Lewis, C. (1973). The reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, 38, 1-10.

Tunnufus, Z., Arifian, D., Furniawan, F., Suharna, D., & Pardosi, P. (2024). The impact of augmented reality on consumer engagement and brand loyalty. *Journal Markcount Finance, 2*(2), 263–273.

Uppot, R. N., Laguna, B., McCarthy, C. J., De Novi, G., Phelps, A., Siegel, E., & Courtier, J. (2019). Implementing virtual and augmented reality tools for radiology education and training, communication, and clinical care. *Radiology, 291*(3), 570-580.

Utami, A. F., Ekaputra, I. A., Japutra, A., & Van Doorn, S. (2022). The role of interactivity on customer engagement in mobile e-commerce applications. *International Journal of Market Research, 64*(2), 269-291.

Vazquez, E. E. (2020). Effects of enduring involvement and perceived content vividness on digital engagement. *Journal of Research in Interactive Marketing, 14*(1), 1-16.

Vo, N. T., Chovancová, M., & Tri, H. T. (2020). The impact of E-service quality on the customer satisfaction and consumer engagement behaviors toward luxury hotels. *Journal of Quality Assurance in Hospitality & Tourism, 21*(5), 499-523.

Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication, 10*(3), 10-34.

Wu, G. (2005). The mediating role of perceived interactivity in the effect of actual interactivity on attitude toward the website. *Journal of Interactive Advertising, 5*(2), 29-39.

Xue, L., Parker, C. J., & Hart, C. A. (2023). How augmented reality can enhance fashion retail: a UX design perspective. *International Journal of Retail & Distribution Management*, 51(1), 59-80.

Yaoyuneyong, G., Foster, J., Johnson, E., & Johnson, D. (2016). Augmented reality marketing: Consumer preferences and attitudes toward hypermedia print ads. *Journal of Interactive Advertising, 16*(1), 16–30.

Yim, M. Y. C., Chu, S. C., & Sauer, P. L. (2017). Is augmented reality technology an effective tool for e-commerce? An interactivity and vividness perspective. *Journal of Interactive Marketing, 39*(1), 89-103.

Yim, M. Y. C., Drumwright, M., & Cicchirillo, V. (2012). How advertising works in new media: Consumer media experience model. In *Proceedings of American Marketing Association at its Annual Summer Marketing Educators' Conference. Chicago, IL*.

Yousaf, A., Amin, I., Jaziri, D., & Mishra, A. (2021). Effect of message orientation/vividness on consumer engagement for travel brands on social networking sites. *Journal of Product & Brand Management, 30*(1), 44-57.

Zahra, A., Ghani, U., Shafiq, M. A., & Iqbal, S. (2024). Impact of Workplace Ostracism on Perceived Organizational Support, Organizational Identity and Employee Productivity. *Bulletin of Management Review, 1*(4), 202-233.

Zheng, R., Li, Z., and Na, S. (2022). How customer engagement in the live-streaming affects purchase intention and customer acquisition, E-tailer's perspective. *Journal of Retailing and Consumer Services, 68*, 1-10.

Ziaullah, M., Kousar, T., Ali, M. A., & Abbas, Q. (2023). Enhancing E-Business Success: Unraveling the Effect of Customer Engagement on Customer Citizenship Behavior and Purchase Decisions in Pakistan. *Journal of Asian Development Studies, 12*(3), 79-96.

Ziaullah, M., Siddique, M., Bilal, A., & Ramzan, M. (2023). Unveiling the sustainable path: Exploring the nexus of green marketing, service quality, brand reputation, and their impact on brand trust and purchase decisions. *International Journal of Social Science & Entrepreneurship, 3*(2), 654-676.