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Exploring the impact of cultural sensitivity in shaping the user engagement towards virtual reality games

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ABSTRACT

The study examines how cultural sensitivity and cultural representation affect user activity in virtual reality (VR) gaming spaces; responding to a growing interest in comprehending the moderating effects of culturally-based design factors in the creation of immersive online spaces. With the growing popularity of VR gaming becoming popular worldwide, gamers are becoming more and more culturally diverse, which creates a necessity to study how language, symbols, storylines, aesthetics, and values influence their intellectual, emotional, and behavioral involvement. The study assesses three fundamental aims through the use of a mixed-methods design and data of 200 participants in Delhi NCR; it determines how cultural sensitivity influences the perception and acceptance of VR games by users, how cultural representation influences emotional immersion and satisfaction of users, and how key cultural factors affect engagement (to facilitate it or not). Results indicate that cultural sensitivity is a key predictor of user acceptance, and therefore culturally responsive design encourages familiarity, inclusivity, and good user attitudes. It is also revealed that there is a moderate positive relationship between cultural representation and emotional immersion and it can be argued that genuine cultural cues enhance the emotional attachment and satisfaction of the users. The discussion also indicates that certain cultural factors play a significant role in engagement, which supports the compatibility of respectful and context-appropriate integration. In general, the study offers empirical data that culturally responsive VR design improves immersion and user experience, which can be helpful to developers interested in developing globally inclusive and meaningful virtual space....

Keywords Virtual reality gaming, Cultural sensitivity, User engagement, Emotional immersion, Cultural representation.

1. INTRODUCTION:

Virtual reality (VR) is gaining prominence across several sectors, including gaming, healthcare, and education. In the virtual reality gaming industry, the user needs a head-mounted display (HMD) device or headset, along with controllers, to provide an immersive and engaging gaming experience. Virtual reality games necessitate substantial processing resources to render and show video frames with little motion-to-photon latency, hence providing players with a real-time immersive experience (Zhao et al., 2021). The concept of cultural sensitivity in virtual reality (VR) games has become one of the crucial aspects that affect the level of user interaction and the quality thereof. Since VR gaming does not obey geographical and language boundaries, it can appeal to a more and more multicultural audience with their own values, norms, and traditions (Moallem and Agbolade 2025). By implementing cultural consciousness in their design methods, developers are able to develop more personally immersive and relatable experiences to the players of various backgrounds. Cultural sensitivity makes sure that characters, plot, environment, and motifs are not just inclusive but also friendly to cultural diversity (Theodoropoulos and Antoniou 2022). This inclusiveness tends to make users feel a sense of belonging enabling them to have an emotional and cognitive attachment to the game world.

Conversely, insensitivity or stereotyping of a culture can make users feel alienated as well as distort immersion (Pardini et al., 2022). In this way, it becomes important to learn the cultural context and incorporate it in the design of VR content to keep the audience engaged and satisfied. The closer the virtual environment is to culture, the higher its chances of causing empathy, interest, and meaningful involvement among players (Flavián et al., 2021). Cultural representation and resonance are closely connected with emotional involvement in playing VR games. When the players relate to the characters, narratives and settings that reflect their cultural realities, their emotional attachment to the virtual environment gets heightened. To give an example, authentic games that represent the traditional clothes or festivals or language dialect can arouse a sense of pride, nostalgia and recognition among participants (Irshad and Perkis 2020). This match between the cultural identity of a player and the virtual world fosters emotional engagement, which raises the level of enjoyment and retention. Conversely, misrepresentation or omission of culture may cause uneasiness, diminishing the sense of presence and compassion of the player. Emotional engagement cannot

be reduced to excitement or thrill only, but in this case, it is the ability of the user to connect and react to content on a more profound, cultural level (FusionVR 2025). Thus, the culturally sensitive game design is a place that help make VR not only a video game that is visually stimulating but also an experience that is emotionally engaging and players feel seen and respected and valued (Wang et al., 2024).

Cognitive and behavioral engagement is also affected by cultural sensitivity in VR games in a significant way. On the cognitive level, culturally sensitive texts provoke cognitive engagement, as they make players think about interpreting symbols, gestures, and plots based on various traditions. This dynamic process encourages critical thinking and improves the learning process of the user in the game (Tang 2024). Culturally, inclusivity promotes a more meaningful interaction of users with virtual environments since they feel that they are recognized as their identity in the logic of the game. As an example, customized user interfaces, customized language choices, and region-centered narratives stimulate the active investigation and involvement (Qadri et al., 2023). Behavioral response therefore changes to active participation rather than passively watching. Besides, if the players perceive that their cultural heritage was promoted with the respect, they will be more likely to share and recommend the game to their social networks, which spread the game and its popularity. Therefore, the mental and performance stimulation generated by the culture sensitivity not only enhances the immersion but the user loyalty and promotion (Yang and Gong 2021).

Table 1: User Engagement in Virtual Reality Environments

Engagement Dimension	Description	Key Indicators
Cognitive Engagement	Mental involvement and focused attention during VR interaction.	Attention span, mental effort, problem-solving involvement.
Emotional Engagement	Degree of emotional connection and affective response toward VR content.	Excitement, empathy, enjoyment, anxiety control.
Behavioral Engagement	Observable participation and interaction within VR settings.	Gesture control frequency, task completion, navigation behavior.
Social Engagement	Interaction with other users or virtual agents within shared VR spaces.	Communication frequency, collaboration level, shared task performance.
Temporal Engagement	Time perception and session duration awareness while using VR.	Session length vs. perceived duration, immersion level.

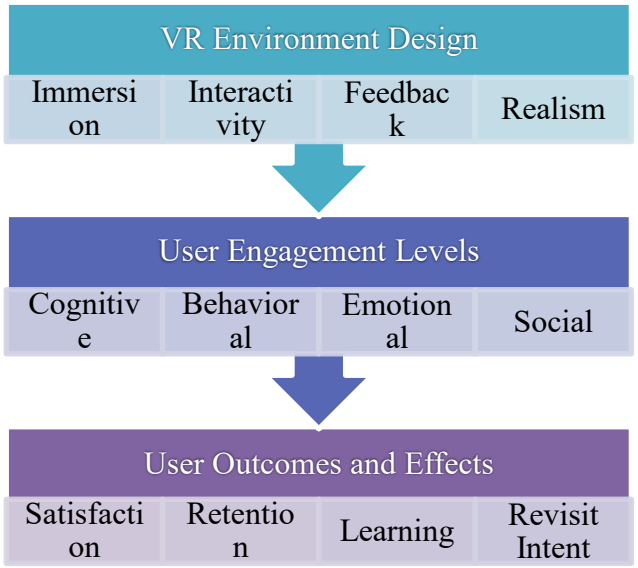

Figure 1: User Engagement in Virtual Reality Environments

The figure and table show the multidimensional structure of the user engagement in virtual reality (VR) environments. The VR Environment Design, which is an immersive, interactive, feedback, and realistic design, is the basis that determines the psychological and behavioral responses of the users. Interpretations of these design factors directly affect User Engagement Levels which include cognitive (mental focus and problem-solving), emotional (affective connection and excitement), behavioral (active participation and interaction), social (communication and collaboration), and temporal (time perception and session duration) aspects. All the dimensions of engagement denote a separate but interrelated layer that adds to the overall VR experience. These dimensions of engagement when combined successfully result in desirable User Outcomes and Effects, such as enhanced satisfaction, increased learning, better acquisition of knowledge, as well as increased desire to return to the VR experience. Altogether, the framework shows that the interaction of the user with VR is an intricate, holistic process that is conditioned by the environmental design aspects that trigger the mind and feelings and, in the end, define the success and effect of VR applications.

In addition to personal interactions, social interaction in multiclonal and community-oriented VR environments is also culturally sensitive. Cultural respectful representation in the game world can help ensure the effective interaction of the players in the cross-cultural environment and

effective collaboration (Rather et al., 2024). The activities that utilize social norms that are inclusive, symbols that are language-neutral and culturally adaptive avatars can drive a classroom climate in which any user with a different background can interact with others without the fear of prejudice or misunderstanding. Such inclusivity increases social cohesion, enabling players to establish friendships and even alliances on the basis of mutual respect (Pagano et al., 2020). The cultural aspect of design also reduces the possibility of cultural conflict, stereotyping or exclusion during the playing. Furthermore, social interaction in this case is not limited to itself to the game itself but to the intercultural awareness and the awareness of the world. With the continued shift to VR as a social medium, and not an individual experience, the culture sensitivity becomes the key to creating inclusive digital communities where diversity is embraced instead of being overlooked (Tao et al., 2021).

The user interaction in VR games and cultural sensitivity point to a larger paradigm shift in digital entertainment. It shows that successful engagement is not only associated with technological advancement, but also emotional, cognitive, and social conformity to the cultural backgrounds of players (Ali 2024). Those developers who learn cultural lessons and apply them to the game design can be more successful in creating the experiences with no boundaries and a global appeal. However, the future of VR gaming is that cultural diversity is a design philosophy and not an add-on (Meegle 2024). Culturally sensitive VR games can be applied to empathy and education and cross-cultural dialogue as the process of globalization gains momentum and can transform the ways users' interface with virtual worlds (Wang et al., 2024). Finally, cultural sensitivity does not undermine the artistic nature of VR, it enhances it, making the interaction a multidimensional experience that reflects the nature of the real world, which is complex and beautiful. The interplay between culture and engagement, therefore, becomes the foundation of the sustainable and inclusive VR innovation (Cheng et al., 2025).

When it comes to VR games, localization and adaptation are paramount to the maximum level of user engagement in various cultural groups. When properly translated and adapted to the local languages, traditions, and esthetic notions, the VR content helps establish a better identification and trust in users (Hershberger et al., 2022). The engagement barriers can be overcome and inclusively encouraged through design considerations such as translation of text, adaptation of symbols, color schemes, and the use of culturally relevant narratives, among others. The study indicates that users become significantly more involved and willing to come back to VR games that address their cultural context and language realities, compared to games that have more of an interface that is generic or foreign (Gao et al., 2021). In addition to increasing enjoyment and immersion, this method also increases the coverage of games to a wider range of audiences across the globe, which enhances cultural preservation as well as potential in the global market (Lin et al., 2024).

The study addresses the role of the cultural sensitivity in determining the degree of user engagement with the virtual reality (VR) games and focuses on how cultural aspects, including language, values, traditions, and social norms, shape emotional, cognitive, behavioral, and social engagement. With the development of VR gaming in the world, it is important to learn the diverse user perspectives as a way of making the gaming inclusive and meaningful. The study notes that culturally adaptive content should be included in the study to create more immersion, empathy, and satisfaction in users. In its effort to solve the cultural diversity in design, the work intends to inform developers on how they can build immersive, cross-culturally applicable and culturally respectful VR gaming experiences.

The study is divided into 6 sections. Section 1 presents the introduction along with sim and significance of the study. Section 2 presents the empirical studies related to title and identified research gap of the study. Section 3 presents the research methodology and conceptual framework of the study. Section 4 presents results and interpretations of the study. Section 5 presents the findings and discussion of the study. Section 6 presents the conclusion along with implications, limitations, and future research directions of the study. Finally, references have been listed.

Empirical Studies

Theme 1: Virtual Reality as a Tool for Cultural Learning and Heritage Preservation

The increased contribution of Virtual Reality (VR) to the revolution of cultural heritage learning through immersive and interactive learning opportunities between past and present cultural knowledge. As shown by Ali (2024), VR serious gaming is an effective method to promote Saudi heritage among young people by integrating entertainment and learning in 3D virtual space. Likewise, Christopoulos et al. (2024) discovered that the immersive 360 0 VR experiences can increase the knowledge of local history and perception of cultural education in adolescents, especially when instruction is designed to fit particular settings. These findings were also supported by Ch'Ng et al. (2020) who pointed out the ability of younger generations to feel the reconstructed culture sites in VR environments that makes them more accepting and interested in cultural history. Overall, these studies show that VR can be utilized to implement experiential learning and therefore make heritage education more entry-level, more enjoyable, and contextual. Nevertheless, they also mention that there has to be a balance between immersion and educational depth since excessive emphasis on visual interaction in the absence of cultural context can result in superficial learning. Therefore, the possibility of VR is in its ability to use realistic representation with pedagogical goals to promote cultural appreciation and historical knowledge that can be retained in the long term.

The combination of gamified methods and VR-based cultural learning has been effective in motivating, engaging and enlightening students of their culture. Lin, Lu, and Lu (2024) examined how the Alternate Reality Games (ARG) and digital technologies can be integrated into Taiwanese cultural education and found out that the study of the sustainable heritage by the students has

improved dramatically. Similarly, Ali (2024) established that gamification in VR heritage simulations is effective in promoting the interests and appreciation of art and history among younger cohorts through merging entertainment and cultural learning. As well, Ehab, Burnett, and Heath (2023) demonstrated the use of VR gamification and Building Information Modeling (BIM) tools in increasing the interaction between the audience and architectural and cultural design, enabling people to co-create urban areas. These works provide a particular focus on the pedagogical and participatory aspects of VR as an educational and design-oriented instrument of learning and exploring culture. VR gamification promotes active learning, emotional engagement, and social discourse in the context of heritage preservation by providing learners access to cultural artifacts and environments. The combination of the gaming aspects and the immersive narration in the cultural education represents the shift in the paradigm of the passive acquisition of knowledge to the active, user-emanated cultural discovery.

Although VR has already proven to be promising in supporting cultural learning, a few studies warn that the technological novelty is not sufficient to ensure that people engage with cultural learning and gain a deeper understanding of different cultures. Gao et al. (2021) established that VR-based culture learning was more desirable because of its immersive experience, although it was not significantly better than non-VR approaches in terms of knowledge acquisition. Equally, Ling et al. (2024) noted that young users are eager about cross-cultural exchange in digital environments although they fail to grasp symbolic aspects of culture, which presents a discrepancy between the immersivity and interpretation of the culture. Such a mindset was cautioned by Christopoulos et al. (2024), as well, and the authors noted that culturally contextualized instructional design is essential in terms of cultural VR learning. These observations indicate that successful VR cultural education should be based on these considerations: technological characteristic, content relevance, and cognitive preparedness of learners. The pedagogical principles that should guide cultural learning in VR are therefore clear cultural authenticity, cognitive learning, and accessibility. With reflective activities and cultural scaffolding, educators are able to make certain that VR does not entertain but leads to real cultural empathy and understanding as well.

Theme 2: User Engagement, Presence, and Emotional Immersion in Virtual Reality Environments

The psychological aspect of presence, or being there, has a great impact on user engagement in VR environments. The study by Pengnate, Riggins, and Zhang (2020) compared the influence of the social and spatial presence on hedonic and utilitarian perceptions of value in users, finding that social presence increases the enjoyment, but spatial presence may decrease engagement in cases when it overloads the cognitive processing. Hammami (2025) also established that immersive VR experiences are positively related to user satisfaction with the involvement of engagement between immersion and satisfaction establishing a relationship. Similarly, Putawa and Sugianto (2024) discovered that the length of play and the best headset technologies are related to greater levels of immersion and engagement but such problems as motion sickness may disrupt the experience. Collectively, the studies demonstrate that VR use is a complex process that is determined by the technological and psychological aspects. The more immersed it is the more it is engaging on the emotional level but a balance between sensory realism and user comfort is paramount. To designers, this means that enabling designers to optimize the presence experience through sensory coherence, narrative flow or ergonomic design can greatly boost user satisfaction and long-term engagement in the VR environment.

A crucial aspect of VR interaction is emotional engagement, which can in many cases be a motivating and satisfying factor to users than the visual or spatial components of VR alone. As it was shown by Irshad and Perkis (2020), interactive digital narratives (IDN) in VR environments increase levels of emotional response and engagement considerably, because the participants are engaged with the stories and characters at a more profound level. Likewise, Hershberger et al. (2022) used the VR immersion in the healthcare training and found that the participants gained more empathy and less biases against marginalized patients, which implies that VR may reform the social attitudes by simulating emotions. The empirical evidence supporting this interrelationship was also presented by Xin (2022), who demonstrated that an emotional engagement has a positive influence on the performance of learning outcomes and test results in VR-based learning setups. These works all support the statement that emotional immersion, which is achieved with the help of interactivity, relatable content, and narrative coherence, is one of the primary motivators of engagement and meaningful experience in VR. Therefore, to establish emotionally rich experiences that would maintain user interest and introduce behavioral change, VR design must incorporate narrative and empathy-driven elements that can accomplish the goal of learning or behavioral change.

In addition to personal interaction, VR can be used to create enormous possibilities of social interaction with others and group participation. A comparison of three platforms, including Sriworapong et al. (2022), revealed that students engaged more in VR environments that simulated games, enjoyed and were found to be more sociable on them than on a traditional online platform. Motivation and enjoyment of physical activities through immersive VR and virtual avatars or teachers, found by Mouatt et al. (2020), also prove the importance of VR in active engagement via embodiment and interaction. The study by Hammami (2025) has also discovered that social interactivity of VR gaming gives a huge boost to the user engagement and satisfaction with the specific focus on the mediating role of emotional connectivity. These results indicate that VR interaction goes beyond immersion to social connectedness, interactivity, and playfulness. Their feeling of community and collaboration increases as the users move through shared virtual spaces, resulting in greater affective and behavioral involvement. It is therefore important to consider socially motivated engagement designs in future VR design to add value to

individual and group immersion results, including cooperative activities, an avatar interaction, and shared experiences.

Research Methodology

The study adopts a mixed-method design, combining both the qualitative and quantitative research methods to obtain holistic data that would explain the role of cultural sensitivity on user engagement in VR games. The study is a descriptive and exploratory study to evaluate the patterns, perceptions, and experiences of users in Delhi NCR.

Data Collection and Sampling

Primary data is collected by the use of primary sources (structured questionnaire) and secondary literature. The stratified random sampling design is used to make all the user groups equally represented, and the overall sample population is 200 respondents representing active or potential users of VR games. The analysis of the quantitative data is done on the basis of both MS Excel and SPSS 27 and statistical methods, including mean, standard deviation, regression, and correlation. Such tools assist in analyzing the correlation between independent variables (cultural sensitivity, cultural representation) and dependent variables (user perception, emotional immersion, and satisfaction).

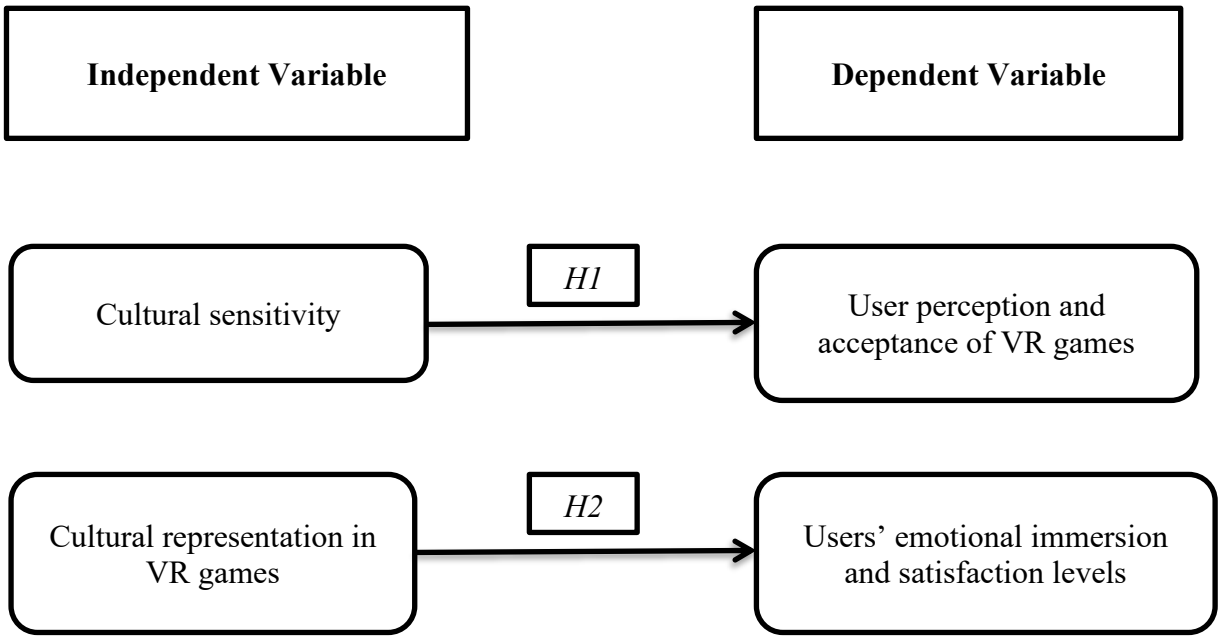

Figure 2: Conceptual Framework

Results and interpretation

Table 2: Demographic Characteristics

S.NO.	Demographic characteristics		N	%
1	**Gender**	Male	102	51
		Female	98	49
2	**Age Group**	Below 18 years	35	17.5
		18–24 years	41	20.5
		25–34 years	39	19.5
		35–44 years	42	21.0
		45-54 years	43	21.5
3	**Monthly Income**	Up to Rs. 1,00,000	72	36.0
		Rs. 1,00,000 – Rs. 3,00,000	58	29.0
		Rs. 3,00,000 – Rs. 5,00,000	42	21.0
		Above Rs. 5,00,000	28	14.0
4	**Educational Qualification**	Diploma	49	24.5

		Doctorate	26	13.0
		Postgraduate	36	18.0
		Undergraduate	43	21.5
		Up to Higher Secondary	46	23.0
5	**Occupation**	Employed	37	18.5
		Homemaker	45	22.5
		Self - Employed	35	17.5
		Student	39	19.5
		Unemployed	44	22.0

The respondents have been well balanced and diverse in terms of gender, age, income, education, and occupation profile. There is a representation of almost equal gender distribution of 51% male and 49% female, which demonstrates that there is little gender bias in the sample. The age distribution is further divided into five categories where the number of individuals of 45-54 years (21.5%), 35-44 years (21.0%), and 18-24 years (20.5%) categories are predominantly represented implying that both the young and middle-age age groups are actively involved. When it comes to monthly earnings, 36% of the population has a monthly income ranging up to Rs. 1,00,000, and 29% have a monthly income ranging between Rs. 1,00,000 and Rs. 3,00,000, which represents the majority of the households in the lower- to middle-income range. Education levels demonstrate that the respondents are well educated with higher secondary (23%), diploma graduates (24.5%), undergraduate (21.5%), postgraduates (18%) comprising the main groups, and 13% having doctoral degrees. The distribution is not very high occupationally and the most populated are the homemakers (22.5%), unemployed (22%), students (19.5%), employed (18.5%), and the self-employed (17.5%). In general, the demographics indicate that there is a variety of respondents, and the study results will be more generalizable and reliable

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Objective 1: To examine the role of cultural sensitivity in influencing user perception and acceptance of virtual reality (VR) games.

H1: Cultural sensitivity has a significant positive influence on user perception and acceptance of virtual reality (VR) games.

Table 3: Model Summary Table

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.385[a]	.149	.144	2.23344
a. Predictors: (Constant), Cultural sensitivity				

The table 3 summary of the model shows that cultural sensitivity is moderate yet significantly related to the dependent variable. The correlation coefficient (R =.385) is positive in association, implying that, with increase in cultural sensitivity, the outcome that is predicted similarly tends to increase. The value of the R square at .149 shows that cultural sensitivity accounts 14.9 percent of the variations in the dependent variable which is a small to medium size explaining power. The adjustment of the R Square (.144) is nearly similar with the value of the R square, meaning that the model is not highly dependent on the sample size. The standard error of the estimate (2.23344) indicates the mean deviation of the predicted scores against the actual scores. In general, the findings indicate that cultural sensitivity is an applicable predictor, but other factors can be used to explain the result, as well.

Table 4: ANOVA Table

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	172.303	1	172.303	34.542	.000[b]
	Residual	987.677	198	4.988		
	Total	1159.980	199			
a. Dependent Variable: User perception and acceptance of VR games						
b. Predictors: (Constant), Cultural sensitivity						

The ANOVA results table 4 shows that the regression model that determines the effect of cultural sensitivity on the perception and acceptance of VR games by users is significant and statistically significant. In the model, the

F-test value is found to be 34.542 and the level of significance is p = 0.000 meaning that the correlation are as a result of randomness. The regression sum of squares (172.303) next to a bigger residual sum of squares (987.677) indicates that cultural sensitivity does not explain the greatest part of the variance in user perception and acceptance but still puts a significant portion, which proves its significance as a predictor. Having 198 degrees of freedom of the residual and the total sum of squares at 1159.980, the model proves that cultural sensitivity is a contributing factor in the development of the perceptions and acceptance of VR games, although other variables not in the model do affect perceptions. On the whole, the ANOVA confirms the importance of the model and supports the importance of cultural sensitivity in interpreting the interaction of users with VR gaming experiences.

Table 5: Coefficients Table

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.570	.685		8.125	.000
	Cultural sensitivity	.361	.061	.385	5.877	.000
a. Dependent Variable: User perception and acceptance of VR games						

The table of coefficients 5 indicates that the cultural sensitivity is an important negative predictor of the user perception and acceptance of VR games. The unstandardized coefficient (B = 0.361) shows that one unit increase in cultural sensitivity leads to an increase of the predicted score of user perception and acceptance by 0.361 units. The standardized coefficient (Beta = 0.385) also supports the power of this relationship as it demonstrates that cultural sensitivity has a medium-positive effect when compared to other possible predictors. The level of significance of t= 5.877 and p=.000 shows that this is statistically significant and it could not have happened by chance. Moreover, the fixed value of 5.570 is the zero level of user perception and acceptance in the case of cultural insensitivity. On the whole, these findings indicate that the increased cultural sensitivity may result in a more favorable user perception and the increased acceptance of VR games, and cultural factors should be taken into account to improve user engagement.

Objective 2: To analyze the relationship between cultural representation in VR games and users' emotional immersion and satisfaction levels.

H2: There is a significant relationship between cultural representation in VR games and users' emotional immersion and satisfaction levels.

Table 6: Descriptive Statistics Table

Descriptive Statistics			
	Mean	Std. Deviation	N
Cultural representation in VR games	9.3550	2.98219	200
Users' emotional immersion and satisfaction levels	9.8050	2.62898	200

According to the descriptive statistics table 6, the respondents had reported rather high levels of cultural representation in VR games, emotional immersion and emotional satisfaction. The cultural representation mean is 9.36 with the standard deviation of 2.98, which indicates that the way users generally see VR games is that it is culturally representative, whereas there is moderate variability in responses. Likewise, the average score of users on their level of emotional involvement and the level of satisfaction is a bit greater at 9.81 and the standard deviation is 2.63 which means that the majority of users feel strongly engaged and satisfied with the experience of playing VR games, but there is still a certain degree of individual experience. On the whole, the results indicate that users have a favorable perception of VR games related to culture inclusiveness and emotional experiences, and the perceptions are distributed generally consistently with a wide range of variations across the sample.

Table 7: Correlations Table

Correlations			
		Cultural representation in VR games	Users' emotional immersion and satisfaction levels
Cultural representation in VR games	Pearson Correlation	1	.392**
	Sig. (2-tailed)		.000
	N	200	200
Users' emotional immersion and satisfaction levels	Pearson Correlation	.392**	1
	Sig. (2-tailed)	.000	
	N	200	200
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 7 of the correlation analysis indicates that the correlation between cultural representation in VR games and the level of emotional immersion and satisfaction of users is meaningful and statistically significant. The Pearson correlation coefficient of.392 implies that there is a moderate positive relationship, meaning that as the user

is likely to perceive VR games as culturally rich, relatable, or representative, it is more likely to attain higher levels of emotional engagement and satisfaction throughout the gameplay. This suggests that the use of cultural aspects in the VR worlds can have a positive impact on the level of connection, presence, and overall pleasure of the user. This p value ($p = .000$) supports the fact that this correlation is very sure, and it is not a matter of sheer coincidence, which proves the importance of the cultural representation as a contributing factor of user experience. Having a well-established sample of 200 individuals, the results indicate that the implementation of culturally relevant material into VR games could significantly enhance user immersion and the satisfaction level, which results in the importance of culturally appropriate and inclusive design styles in building more engaging VR experiences.

Objective 3: To identify the key cultural elements (language, symbols, narratives, aesthetics, and values) that enhance or hinders user engagement in VR gaming experiences.

H3: Cultural elements such as language, symbols, narratives, aesthetics, and values significantly affect user engagement in VR gaming experiences.

The determination of the main cultural aspects, including language, symbols, stories, aesthetics, and values, is vital to comprehending the ways of how users relate to gaming in VR. These factors have a great impact on the way players perceive virtual worlds, reach out to the characters, and connect with the plotline (Yang, 2023). A sense of familiarity and inclusion is promoted through language, and authenticity and emotional engagement are promoted through the use of meaningful cultural symbols and aesthetically designed elements. The use of culturally relevant themes in narratives also enhances the user engagement because it enables it to have their identities and experiences in the virtual world mirrored. When all these elements work in the favour of cultural contexts of users, it helps to have a more immersive, enriched, and satisfying VR experience (Theodoropoulos, & Antoniou, 2022).

Another factor that is not ignored to retain user engagement is cultural representation. The incorrect or lack of sensitivity in the application of language, symbols, or visual aspects may decrease the level of immersion and disengagement. The aesthetics of the culture which does not match the expectations or values of the user can result in a disconnect with the virtual space, whereas narratives which do not play to the cultural background can restrict emotional engagement (Jafarkhani, et al., 2024). The effectiveness of VR game credibility and popularity can be improved by making sure that cultural elements are displayed in a respectful, thoughtful, and contextually accurate way. When handled by a knowledgeable and professional integration of these components, developers can produce an experience that moves various users and help maintain their interest (Bertrand, et al., 2021).

Findings and Discussion

The findings of the study suggest that the cultural sensitivity could play a significant role and affect the user perception and consequent reception of VR games, which is based on the prior research on the applicability of cultural awareness to the immersive media. The relationship between cultural sensitivity and user acceptance is positive, which implies that VR experiences that involve the use of a culturally recognizable language, aesthetics, and values put a more diverse user base into a more inclusive and relatable environment (Moallem and Agbolade, 2025). This aligns with other researches emphasizing that culture-based design items are helpful to promote the sense of presence and belonging to the virtual environment and encourage cognitive and emotional communication (Theodoropoulos and Antoniou, 2022). By making sure that cultural awareness serves as a valuable contribution to the percentage of VR games acceptance among users, the current study contributes to the existing bulk of literature that serves to support the notion of culturally conscious design in the context of interactive and immersive technologies.

The results also show that there is actually a strong relationship between the problem of cultural representation in VR games and the extent of emotional immersion and satisfaction of the user. The positive moderate indicator shows that the greater the number of people who deem VR games as a culturally representative experience due to its utilization of authentic symbols, stories, and graphics, the more that game is explored on an emotional plane. This finding is reflected in the works of Irshad and Perkis (2020) who claim that culturally meaningful features of the stories and interactive online stories elicit greater emotional responses and make the user more engaged in the virtual reality. The previous studies suggest that genuine cultural messages are also useful to generate empathy, recognition, and emotional connection that generate greater satisfaction and overall enjoyment (Flavian et al., 2021). The given insights are also supported by the present study as it shows that cultural representation does not merely represent an aesthetic supplement to the gameplay in VR but constitutes a tangible supplement to emotional involvement.

In addition, the analysis identifies language, symbols, stories, aesthetics, and values as the most important cultural aspects that can either facilitate or hinder user engagement. The study, as per the literature in the field, points out that stories and images, which are culturally fitting, increase the degree of user attraction towards the virtual environment, stimulating their thinking process and the degree of their behavioral involvement (Yang, 2023; Qadri et al., 2023). At the same time, culturally inappropriate or badly located elements may disrupt the immersion, leading to engagement or emotional distance, which Jafarkhani et al. (2024) have stated as an issue of shallow cultural integration in digital space in their criticism of the problem of superficial cultural integration in digital space. The study reiterates the significance of respectful and contextual-based cultural design by demonstrating the two-sided potentials of cultural aspects to ease or obstruct interaction. All these suggestions verify the notion that the cultural sensitivity of VR games development is crucial to the practice of enhancing the immersion experience and the development of the virtual

spaces, which can be inclusive enough to address the diverse groups of people worldwide on a significant level.

2. CONCLUSION

The analysis demonstrates that cultural sensitivity and cultural representation is one of the key factors in user engagement in virtual reality or VR gaming worlds. These results confirm that cultural sensitivity positively influences the perception and acceptance of VR games by the users, and it is important to note that culturally sensitive design elements facilitating inclusiveness and familiarity are essential. Similarly the medium positive relationship between cultural representation and emotional involvement and satisfaction of the users underscores the application of culturally based narratives, symbols, and aesthetic to their advantage in enhancing the degree of emotional involvement to bring about emotional satisfaction. More so, the identification of language, symbols, storylines, aesthetics, and values as some of the key cultural elements confirms that attention, accuracy, and sensitivity to culture are crucial in designing VR games. The collective outcomes suggest that the culturally attentive VR experiences do not just raise the cognitive, emotional, and behavioral involvement, but also assist to create the immersive, relatable, and universally appealing virtual worlds. The study hence emphasizes the need of designers to concentrate on cultural cognition as an aspect component of VR design in the name of developing more inclusive, meaningful and engaging VR gaming experience.

Implications, Limitations, and Recommendations for Further Studies

The results of the study have valuable implications to VR game designers, researchers, and cross-cultural technology creators as it proves that cultural sensitivity and culturally-based design components have an influential positive effect on the perception of the users, their emotional engagement and satisfaction. These findings reify the importance of introducing correct language, symbols, stories, aesthetics, and values to VR space to make it more familiar, inclusive, and engaging to various audiences, which further expand the current theoretical literature on intercultural interaction within the context of immersive media. Meanwhile, the study is constrained with its geographically specific sample of the Delhi NCR area, the use of self-reports, and their correlational research designs, which limit generalization and allow causal inferences. The lack of cross-cultural comparisons and possible differences in the quality of the VR technology or the level of familiarity with it also restricts the focus of the conclusions. To overcome these limitations, the subsequent study consider culturally sensitive VR participation among more diverse populations, adopt experimental or longitudinal designs to determine causal effects, and combine qualitative and psychophysiological approaches to understand better how users perceive it, experience certain emotions, and behave.

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