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The Impact of Game Quality on Consumers' Willingness to Spend in Otome Games: The Mediating Role of Sense of Immersion

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Abstract:

The rise of the female gaming market has triggered a surge in otome game consumption. Drawing on the SOR theoretical framework, this study systematically examines the influence mechanisms of several common quality dimensions in otome games on consumers' purchase intention and verifies the mediating role of immersion. Based on an empirical analysis of 321 valid samples, the results show that audiovisual quality, narrative quality, technical and usability quality, and community and additional content quality all exert significant positive effects on purchase intention, with part of these effects transmitted indirectly through immersion. The study highlights the bridging role of immersion between game quality and purchase intention, underscoring its importance as a core psychological mechanism. Building on these findings, the paper proposes managerial implications, suggesting that game enterprises should attach equal importance to technical optimization and content innovation, while integrating immersive experiences as the central objective of product design and operational strategies.

Keywords: Otome games; Consumers' willingness to spend; sense of immersion.

1. Introduction

With the rapid development of the digital entertainment industry, online games have become an indispensable part of people's leisure lives [1]. Traditionally, the majority of online game consumers were male players. However, with the rise of female purchasing power and the diversification of entertainment needs, female-oriented games have gradually expanded beyond Asia and begun to gain global popularity [2]. As the largest consumer market in Asia, China now has over 300 million female gamers, who contribute to more than 30% of the total domestic gaming revenue [3].

Among female-oriented games, otome games represent a prototypical subgenre, characterized by core gameplay that centers on developing romantic interactions between the player and multiple male characters. For example, in the first half of 2024, the top-grossing otome game Love and Deep Space called "Lian Yu Shen Kong" generated a cumulative revenue of 1.62 billion RMB (Sensor Tower Data, 2024). However, as the game market shifts from an "incremental market" to a "stock market" model, competition in the female-oriented game sector has intensified. Delayed launches, server shutdowns, and operational challenges have become increasingly common. At the same time, homogenization within otome games is rampant, with many titles mimicking one another in content and structure.

Existing research on otome games has predominantly focused on sociological and psychological dimensions, such as the emotional attachment between players and virtual characters [4], or the formation of parasocial romantic relationships [5] that help alleviate loneliness and enhance subjective well-being [6]. While these studies offer meaningful interpretations of the genre's popularity, they lack a consumer behavior perspective that could inform strategies for game renewal and player retention.

Some recent studies have started to investigate players' personal characteristics and their impact on purchase intention [7]. For instance, some studies explored how father-daughter dynamics influence emotional dependency on virtual characters [8]. However, such research primarily addresses individual-level traits, providing limited insight into how game developers can optimize design features to stimulate user engagement and spending. Thus, there remains a significant research gap in understanding how game design elements such as content, aesthetics, and interaction mechanics influence players' willingness to consume otome games.

To address this gap, the present study aims to analyze the factors that influence female players' purchase intentions in otome games, with a particular focus on design aspects created by game companies, including audiovisual presentation, narrative content, interaction mechanisms, gameplay complexity, and community engagement. Drawing on the Stimulus-Organism-Response (SOR) theoretical framework, this research will employ a questionnaire-based empirical method to systematically examine the linear relationships between game design factors, character attractiveness, and consumer purchase intention. The goal is to provide actionable insights for developers, emphasizing the link between game quality and consumer behavior. In doing so, this study seeks to offer practical guidance for the future development of female-oriented games, helping the industry create more competitive and profitable products, and ultimately foster a healthier and more sustainable ecosystem for this emerging genre.

2. Method

2.1 Questionnaire Design

The questionnaire designed for this study consisted of four sections: 1) The first section served as a screening mechanism to ensure that respondents were players of otome games. If a respondent indicated otherwise, the questionnaire was terminated immediately, and the submission was recorded as an invalid response. 2) The second section collected information about players. This included personal characteristics, such as gender, age, education level, relationship status, and income level, and usage behaviors, including gaming frequency, daily playtime, and total in-game spending. 3) The third section measured players' perceptions of audiovisual quality, narrative quality, interactivity quality, technical & usability quality, and community & additional content quality in otome games. All measurement items for these variables were adapted from prior studies [9-12]. 4) The fourth section, following the scale developed by Balakrishnan and Griffith [13], measured consumers' willingness to spend on otome games.

For the third and fourth sections, a five-point Likert scale was employed, ranging from "strongly disagree" to "strongly agree." Detailed variables and items are presented in Table 1.

Table 1. Confirmatory factor analysis results

Variable	Items	Cronbach's α	Factor Loading	AVE	CR
Audiovisual Quality (AVQ)	I like the artistic design of the game (including but not limited to character illustrations, backgrounds, CG animations, etc.)	0.864	0.885	0.698	0.873
	I appreciate the acoustic design of the game, including voice acting, background music, and sound effects		0.898		
	I like the overall visual and auditory style of the game		0.711		

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Variable	Items	Cronbach's α	Factor Loading	AVE	CR
Narrative Quality (NQ)	I find the game's storyline coherent and free from logical flaws	0.800	0.731	0.585	0.808
	I find the characterization of game characters distinctive and appealing		0.795		
	I feel that I have the freedom to influence the direction of the game's storyline		0.766		
Interactivity Quality (IQ)	My actions are immediately reflected in the game	0.778	0.722	0.542	0.780
	I find the settings related to values, probabilities, and strategies in the game reasonable		0.769		
	I find the game's level of operational difficulty manageable		0.716		
Technical & Usability Quality (TUQ)	The game's interface design makes it easy for me to operate	0.827	0.831	0.606	0.822
	The game runs smoothly, with minimal lag or technical issues		0.773		
	I can play the game smoothly on different devices		0.729		
Community & Additional Content Quality (CAQ)	I am satisfied with the atmosphere and activity level of in-game and external player communities	0.739	0.708	0.519	0.762
	I am satisfied with the frequency and content of game updates		0.811		
	I am satisfied with the quantity and quality of derivative works (e.g., merchandise, comics, animations, novels)		0.629		
Sense of Immersion (SI)	I can become fully immersed in the game	0.784	0.735	0.549	0.785
	The game can fully capture my attention		0.765		
	The game can fully engage my interest		0.722		
Consumers' Willingness to Spend (WTS)	I will continue to spend money on the game	0.866	0.890	0.689	0.869
	I feel that spending money on the game is worthwhile		0.847		
	I will recommend other players to make in-game purchases		0.748		

2.2 Data Collection

Data was collected through an online survey distributed via Wenjuanxing, a professional online questionnaire platform, starting on August 8, 2025. The target population was otome game players. In addition, a snowball sampling strategy was used on social media platforms to invite eligible participants to complete the survey anonymously.

The online questionnaire was open for five days, yielding a total of 411 responses. After manually removing invalid questionnaires such as those with mismatched respondent identities, abnormal completion times, patterned answers, or inconsistent responses to reverse-coded items, 310 valid questionnaires remained, resulting in an effective response rate of 75.43%.

As it showed in Table 2 most participants were young adults, with 72.26% aged 18–25, and over half held at least a bachelor's degree. In terms of relationship status, 52.26% were single and 32.90% were in a relationship, reflecting the genre's appeal to players with emotional needs. The majority reported a monthly disposable income between 1,000 and 3,999 RMB (73.55%), consistent with low-cost spending patterns. Regarding usage, 69.03% played daily, though typically for less than 30 minutes

per session. Cumulative spending was concentrated in the 100–1,000 RMB range, indicating a core group of young, educated, and highly engaged but low-to-moderate spending players.

Table 2. Sample Description

Variable	Options	Frequency	Percentage (%)
Age	Under 18	16	5.16
	18–25 years	224	72.26
	26–30 years	60	19.35
	Above 30 years	10	3.23
Current Education Level	High school / vocational school	40	12.90
	Associate degree	96	30.97
	Bachelor's degree	138	44.52
	Master's degree	30	9.68
	Doctoral degree	6	1.94
Current Relationship Status	Single	162	52.26
	In a relationship	102	32.90
	Married	46	14.84
Average Monthly Disposable Income	1000 RMB or below	14	4.52
	1000–1999 RMB	106	34.19
	2000–3999 RMB	108	34.84
	3000–4999 RMB	14	4.52
	4000–5999 RMB	24	7.74
	6000 RMB and above	44	14.19
Frequency of Playing Otome Games Recently	Rarely (once every few months)	6	1.94
	Occasionally (a few times a month)	16	5.16
	Sometimes (a few times a week)	74	23.87
	Frequently (once a day or more)	214	69.03
Average Daily Time Spent on Each Otome Game	Less than 15 minutes	96	30.97
	15–30 minutes	106	34.19
	31–60 minutes	54	17.42
	More than 1 hour	54	17.42
Cumulative Spending on Otome Games	Below 100 RMB	42	13.55
	100–500 RMB	92	29.68
	501–1000 RMB	108	34.84
	1001–3000 RMB	38	12.26
	3001–5000 RMB	14	4.52
	5001–10,000 RMB	10	3.23
	More than 10,000 RMB	6	1.94
Total		310	100.00

2.3 Data Analysis Method

Data analysis was conducted using SPSS 24.0. The initial stage included: Reliability testing, Validity assessment, Common method bias detection, Descriptive statistics, Correlation analysis, Multicollinearity diagnostics.

The advantages of applying multiple regression in this study are twofold: it allows the simultaneous inclusion of

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multiple game quality dimensions as predictors of WTS, while controlling for demographic variables (e.g., age, education level and relationship status) . This enables the identification of the most influential quality dimensions for prioritizing game design improvements.

It facilitates a two-step mediation test for SI, enabling the estimation of both direct and indirect effects, thereby providing empirical support for the Stimulus–Organism–Response (SOR) model.

Subsequently, Subsequently, multiple regression analysis was conducted to examine the linear relationships among the variables. By incorporating age, education level(EL), and relationship status(RS) as control variables, the analysis evaluated the effects of audiovisual quality (AVQ), narrative quality (NQ), interactivity quality (IQ), technical and usability quality (TUQ), and community and additional content quality (CAQ) on consumers' willingness to spend (WTS), while also considering the mediating role of sense of immersion (SI). Based on this framework, ten hypotheses (H1–H10) were formulated, as illustrated in Fig. 1.

$$CWS = \gamma_0 + \gamma_1 AVQ + \gamma_2 NQ + \gamma_3 IQ + \gamma_4 TUQ + \gamma_5 CAQ + \gamma_6 SI + \gamma_7 AGE + \gamma_8 EL + \gamma_9 RS + \epsilon \quad (1)$$

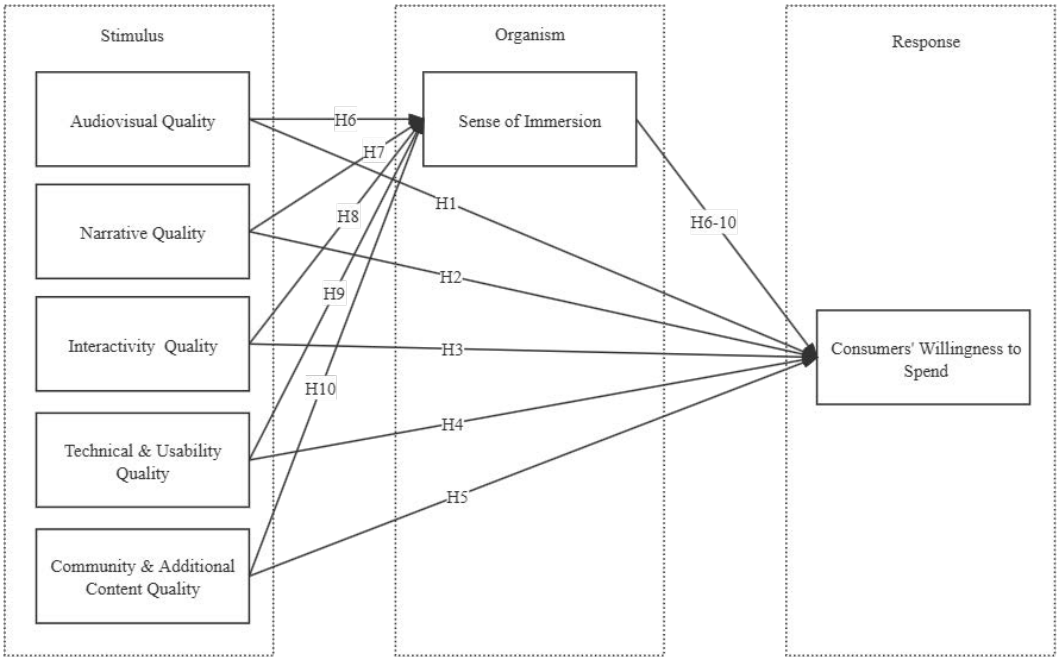

Fig. 1 Proposed research model (Picture credit : Original).

3. Results and Discussion

3.1 Reliability Analysis

As shown in Table 1, the Cronbach's α values for all variables range from 0.739 to 0.866, exceeding the threshold of 0.7, indicating good reliability. The KMO value and Bartlett's test result are 0.941, suggesting that the variables are suitable for factor analysis. On this basis, confirmatory factor analysis was further conducted to examine convergent and discriminant validity. All standardized factor loadings range from 0.519 to 0.698, above the required threshold of 0.5. The average variance extracted (AVE) values for each construct are between 0.533 and 0.572, greater than 0.5; and the composite reliability (CR) values range from 0.798 to 0.924, greater than 0.7. As illustrated in Table 3, the square roots of the AVE are larger than the absolute values of correlations between each construct and others. In addition, all VIF values are below 5 and tolerance values are above 0.1. Collectively, these six criteria are satisfied, indicating that the model structure demonstrates good validity and reliability [14].

Table 3. Descriptive statistics

Variable	Mean	SD	AQ	NQ	IQ	TUQ	CAQ	SI	CWS	VIF
AQ	4.612	0.591	0.836							2.815
NQ	4.075	0.583	0.749	0.765						3.249
IQ	3.991	0.609	0.645	0.656	0.736					2.436
TUQ	3.883	0.583	0.509	0.627	0.633	0.779				2.410
CAQ	3.884	0.645	0.663	0.683	0.685	0.663	0.720			2.890
SI	4.243	0.672	0.684	0.721	0.639	0.595	0.697	0.741		2.758
CWS	3.633	0.674	0.624	0.677	0.598	0.677	0.669	0.660	0.830	2.573

Note: (1) Sample size N = 310; (2) *p < 0.05, **p < 0.01; (3) The diagonal values represent the square roots of the average variance extracted (AVE).

3.2 Hypothesis Testing

SPSS 24.0 was employed to test the main effects. As shown in Table 4, Model 1 indicates that AQ (β = 0.177, p < 0.05), NQ (β = 0.204, p < 0.05), TUQ (β = 0.428, p < 0.01), and CAQ (β = 0.195, p < 0.01) all have significant positive effects on CWS, thereby supporting Hypotheses H1, H2, H4, and H5. In contrast, IQ (β = 0.030, p > 0.05) exerts a nonsignificant positive effect on CWS, and thus Hypothesis H3 is not supported.

These findings suggest that players'willingness to spend in otome games is indeed influenced by multiple dimensions of game quality, consistent with prior research [15, 16]. Among these, technical and usability quality exerts the strongest influence, which reflects the ongoing technological upgrades in otome games. For instance, the integration of 3D rendering technology has led to compatibility issues on some devices, thereby affecting players' purchase intentions [17]. By contrast, the insignificant effect of interactivity can be explained by the relatively fixed gameplay mechanisms across most otome games. In the absence of substantial variation in interaction design, such features are unlikely to exert a clear influence on players' willingness to spend.

Table 4. Regression analysis results

Variable	Model 1 CSW	Model 2 SI	Model 3 CWS	Model 4 CWS
	β	β	β	β
AGE	-0.070* (-2.381)	-0.014 (-0.501)	-0.052 (-1.550)	-0.068* (-2.328)
EL	0.044 (1.727)	0.046 (1.847)	-0.016 (-0.539)	0.037 (1.460)
RS	0.020 (0.737)	0.003 (0.114)	0.030 (0.901)	0.020 (0.727)
AQ	0.177** (2.632)	0.234** (3.585)		0.142* (2.080)
NQ	0.204** (2.782)	0.316** (4.453)		0.156* (2.079)
IQ	0.030 (0.490)	0.118 (1.964)		0.012 (0.201)
TUQ	0.413** (6.594)	0.125* (2.061)		0.394** (6.305)
CAQ	0.195** (3.140)	0.240** (3.993)		0.158* (2.511)
SI			0.651** (15.047)	0.152* (2.578)
R^2	0.611	0.633	0.443	0.619

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Adjusted R^2	0.601	0.623	0.435	0.608
F-value	F =59.078**	F =64.796**	F =60.529**	F =54.238**

Note: (1) Sample size N = 321; (2) *p < 0.05, **p < 0.01; (3) The table reports standardized regression coefficients; (4) t-values are reported in parentheses.

Table 4, Model 2 shows that AQ (β = 0.234, p < 0.05), NQ (β = 0.316, p < 0.05), TUQ (β = 0.125, p < 0.05), and CAQ (β = 0.240, p < 0.05) all have significant positive effects on SI, whereas IQ (β = 0.118, p > 0.05) is not significant. Since IQ is nonsignificant for both CWS and SI, it was removed from the subsequent mediation analysis. The bootstrap test conducted with the PROCESS macro (see Table 5) shows that the 95% confidence intervals did not include zero, indicating the presence of mediation effects. Accordingly, Hypotheses H6, H7, H9, and H10 are supported.

As one of the central topics in current otome game research [18], immersion is confirmed in this study to have a significant positive effect on players' purchase intention. Moreover, immersion is shown to be influenced by multiple dimensions of game content such as audiovisual quality, thereby functioning as a mediator. These findings are consistent with existing studies [19], further validating prior research.

Table 5. Bootstrap test results of the mediating effect

Influence path	Effect	SE	95%CI		Mediation Type	Effect Proportion
			LI	UI		
AQ=>SI=>CWS						
Total Effect	0.185**	0.018	0.006	0.077	Partial mediation	21.762%
Direct Effect	0.144*					
Indirect Effect	0.040					
NQ=>SI=>CWS						
Total Effect	0.209**	0.022	0.009	0.096	Partial mediation	24.577%
Direct Effect	0.397**					
Indirect Effect	0.051					
TUQ=>SI=>CWS						
Total Effect	0.420**	0.012	0.002	0.049	Partial mediation	5.607%
Direct Effect	0.397**					
Indirect Effect	0.024					
CAQ=>SI=>CWS						
Total Effect	0.203**	0.057	0.008	0.083	Partial mediation	20.467%
Direct Effect	0.161**					
Indirect Effect	0.041					

Note: *p < 0.05, **p < 0.01.

3.3 Managerial Implications

This study, through multiple regression and mediation analyses, finds that players' willingness to spend in otome games is influenced not only by different dimensions of game quality but also by the mediating role of immersion. These results provide several managerial implications for game companies in terms of product design, operational strategy, and long-term development.

First, narrative quality and audiovisual quality remain the key levers for enhancing players' purchase intention. Regression results show that both dimensions significantly and positively affect immersion and purchase intention, with relatively high mediation effects. This indicates that compelling storylines and refined audiovisual design are core mechanisms driving female players' emotional involvement and spending conversion. Developers should therefore continue investing in narrative creation, character design, and visual–audio optimization, while avoiding homogenization through differentiated content strategies to foster long-term user engagement.

Second, technical and usability quality shows the strongest direct effect. As otome games continue to evolve, sta-

bility, smoothness, and ease of operation form the foundation for sustaining players' willingness to spend. Even if narrative and art quality are high, issues such as lagging, crashes, or complex interfaces can still cause user attrition. Developers should thus prioritize technical stability, interface optimization, and cross-device compatibility to secure a seamless user experience and enhance conversion rates.

Third, community and additional content quality plays a significant role in fostering long-term spending potential. Results demonstrate that CAQ not only directly improves purchase intention but also indirectly promotes spending through immersion. This suggests that active community interactions and derivative content (e.g., merchandise, comics, or animations) can enhance immersive experiences and extend the consumption chain. Companies should therefore emphasize community-building and cross-media operations, promoting linkages between otome games and the wider cultural and creative industries to create a holistic female-oriented entertainment ecosystem.

Finally, sense of immersion is identified as a core psychological mechanism driving purchase intention. Across audiovisual, narrative, and community dimensions, immersion consistently mediates the relationship with consumption. This implies that managers should treat immersion as a central design objective, integrating multiple quality dimensions to effectively strengthen players' willingness to pay.

4. Conclusion

In summary, this study examined the mediating role of sense of immersion in the formation of purchase intention, drawing on the SOR theoretical framework and focusing on various dimensions of otome game quality. The theoretical contribution of this research lies in introducing a consumer behavior perspective into the field of otome games, thereby enriching the literature on this type of digital entertainment consumption. In practice, the findings suggest that developers should prioritize investment in narrative design and community-building, and integrate products and services around immersion as the core experience.

However, this study has certain limitations, such as reliance on a single research method and a relatively narrow sample. Future research may expand by combining qualitative interviews or corporate data to deepen understanding of otome game consumption behavior.

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