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Research paper

The Influence of Live Streaming of E-Sports on Users ' Willingness to Pay: Mediating Role of Immersion, Interactivity, Moderating Role of Live Streaming Platform Quality and A Chor's Influence

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Abstract

The rise of e-sports presents new opportunities for live streaming monetization. Understanding user willingness to pay (WP) for premium content is crucial for platforms and streamers to optimize engagement and revenue, with prior research highlighting user intent, streamer perception, and engagement metrics. The current investigation aims to examine the effect of live streaming on users' WP for e-sports, with an emphasis on the mediating roles of immersion (Immer) and interactivity (Inter), as well as the moderating impacts of live streaming platform quality (LSPQ) and anchor influence (ANI). A structured survey was distributed to 1,000 individuals, with 500 complete responses from participants on various e-sports forums and streaming sites. The survey measured characteristics such as desire to watch e-sports (IWLS), WP, viewer perception of the streamer (VPS), viewing metrics (VM), Immer, Inter, ANI, and LSPQ. To assess correlations tween factors, the data was analyzed employing structural equation modelling (SEM) by IBM SPSS AMOS 26. The data demonstrated ($p<0.05$) that Immer and Inter play an important function in facilitating the relationship between VM and WP. Furthermore, the ANI and LSPQ were found to moderate these connections, thereby improving user engagement and WP. The research illustrates the value of Immer as well as Inter in increasing user engagement and revenue in e-sports by streaming live, thereby improving the standard of the stream.

Keywords: *E-Sports; Live Streaming Platform; Structural Equation Modelling (SEM); Anchors Influence; Social Media.*

1. Introduction

The emergence of e-sports has revolutionized how people interact with video games. This modification includes e-sports live-streaming. People across the world watch tier-one gamers on live-streaming services like Twitter, web gaming, and a game on Facebook. The viewer platforms signify and depict a situation in which spectators become spectator-participants instead of passive observers [1]. Game streaming services' content quality, viewer involvement, and network usability increase viewer willingness to pay (WP) for exclusive material and perks, generating revenue and providing an engaging and congenial benefit to the viewer [2]. Streaming is not only the act of offering live content, but it also includes the specific characteristics that set streaming apart from more traditional ways of consuming media. E-sports live streaming allows users to consume the content instantaneously through multiple interactive streams [3].

The immediacy of streaming platforms allows users to connect with their online peers, fostering interactivity, engagement, and community through live chats, poll reactions, and feedback from streamers, providing a unique consumption experience [4]. E-sports live streaming also enhances user engagement and connection, ultimately offering viewers a more satisfying consumer experience, and potentially leading to increased ad-free viewing, select perks, and additional subscriptions for new content [5]. The streaming platforms are integral to the e-sports streaming experience. The platform's video quality, steady streaming, buffered streaming speeds, and interface design all have implications for the user experience while viewing the stream [6].

The platform has low quality, which negatively impacts the experience, most importantly, immersion and interaction, which can lead to dissatisfaction for the viewer. Platforms with superior architecture and design improve the user experience, increasing the likelihood that users can pay [7]. High-quality platforms provide seamless access to content, enabling viewers to engage with video streams without interruptions. Interactive elements are expected from live streaming services. The streamer's personality significantly impacts viewer impact and retention, influencing their WP [8]. Streamers in e-sports build loyal audiences by connecting with their audience, providing a feeling of community, and delivering engaging experiences. Their personality leverages their brand and makes them stand out, making them part of the viewer's experience [9]. Viewers' WP for e-sports live streams is crucial for industry expansion. Content creators focus on

revenue through advertisement and sponsorship, but subscription-based options are attracting users. Factors determining pay include perceived value, interaction, and streaming experience. Viewers pay for interesting, interactive, and immersive content, enhancing their emotional and cognitive engagement [10]. The research investigates the factors that affect the e-sports viewers' WP for premium content, focusing on the impacts of viewer intention to watch, engagement with the streamer, immersion, viewing metrics, platform quality, and streamer influence; the data was analyzed using Structural Equation Modelling (SEM).
The organization of the research has been divided into the following phases: Phase 1 discusses the introduction of the research. Phase 2 involves relevant works and development of hypotheses, Phase 3 includes the data collection, survey, as well as analysis, and Phase 4 contains results and discussion. Phase 5 involves the conclusion.

2. Relevant works

Self-determination theory [11] was used to examine the factors impacting e-sports players' live streaming engagement. The theory created an e-sports broadcasting viewers' motivational scale that examined both internal and external reasons. The results indicated that internal drive was the dominant navigating factor, while external incentive was unimportant. The decisions of e-sports gaming video viewers, specifically the relationship among motivation, expertise, and perceived worth, were analyzed in the research [12]. The method included 410 people who watched e-sports game footage during the last six months. According to the findings, viewer motivation directly impacts perceived worth, driving good behaviour in the gaming industry, particularly among males aged 19-24 watching games for no monetary gain.
The aim was to use the E-sports Consumption (ESC) model [13] to examine the reasons for and effects of e-sports gameplay. The research identified six drivers of e-sports gaming intention and behavioural consequences, based on 348 e-sports users' data, indicating a causal link between engagement intention, gameplay, and media use. The factors that influence e-sports purchases among Chinese gamers, with an emphasis on "King of Glory," were examined [14]. The findings showed that product qualities, incentive elements, memento items, and festival activities all have a substantial influence on consumer experiences. Understanding these demands could aid businesses in developing tailored promotional strategies.
The way e-sport spectatorship motivation [15] influences fans' flow training, subjective well-being, decision-making, and game loyalty was investigated. The research paradigm utilized surveys to assess relationships, revealing that accomplishment, drama, player skills, individual happiness, friendship, and social factors significantly influence fan fulfilment and behaviour. The experience with e-sports games [16] influenced its antecedents and outcomes. It divided players into two categories based on their frequency of gameplay. Research categorized players based on gameplay frequency, finding that gaming intention predicts effective engagement among infrequent players, highlighting customer heterogeneity and the relevance of past gameplay experiences.
The function of e-sports materials live streaming as a connection between e-sports recreation games and e-sports activity broadcasting was investigated [17]. Data collected from 5598 e-sports aficionados revealed that the continual transmission of e-sports material has a substantial impact on the desire to participate in e-sports playing and event broadcasting. The research [18] investigated the influence of e-sports on conventional sports in the COVID-19 epidemic, emphasizing six gamification paradigms and demonstrating how e-sports may bridge the gap between gaming and normal sports.
The studies have effectively demonstrated the interrelationships among immersion, interactivity, and viewer willingness to pay (WP) within the e-sports live-streaming context; nevertheless, several gaps and contradictions warrant further investigation. Most of the already quoted research provides a highlight on the positive impact of immersion and interactivity on engagement and WP. However, there is little agreement with possible diminishing returns associated with excessive interactivity. Some of these interactive features can make the viewing experience more enriched, while others transform it into a distraction for viewers and lead to withdrawal, hence causing a gap between expected and real interaction merits. Besides, the vague nature of the terms immersion and interactivity among research papers arises, leading to inconsistent results, a problem that makes drawing any solid conclusions about the exact effects of the two terms on user behaviour in particular environments hard. The existing studies also do not pay enough attention to the intervening role of intermediate variables identified as age, cultural background, and experience in playing games as potential moderators of the correlation between characteristics of streaming and WP. As an example, the younger generation is probably used to more interactive content and has high WP as compared to older generations who still favor the traditional viewing environment. This demographic diversity can bring about inconsistency in the generalization of the findings on either side of the audience segment. Although these studies realize the significance of platform quality and streamer effect, its present minimal investigation of the relationships between them and other emerging patterns in the customer. The evaluation of these blind spots and inconsistencies would produce a more subtle understanding of user participation in online settings and improve the applicability of the results outside the e-sports niche.

2.1. Hypothesis development

The analysis explores the impact of user intent, streamer perception, viewing metrics, and immersion on e-sports live streaming, highlighting the influence of interactivity, influence, and quality on user engagement and monetization, is shown in Figure 1.
H1: Intention to watch e-sports live-streaming (IWLS) has a positive effect on users' willingness to pay (WP) (IWLS → WP).
H2: The viewer's perception of the streamer (VPS) relates positively to viewers' WP (VPS →WP).
H3: Viewing metrics (VM) positively impact users' WP (VM →WP).
H4: The mediated relationship of immersion (Immer) in the IWLS, and WP (IWLS→ Immer→WP).
H5: Immer mediates the relationship between VPS and users' WP (VPS → Immer → WP).
H6: Interactivity (Inter) mediates the relationship between VM and users' WP (VM → Inter →WP).
H7: Anchor's influence (ANI) moderates the relationship between VPS and users' WP for the content (VPS →ANI → WP).
H8: The live streaming platform quality (LSPQ) moderates the relationship between VM and users' WP (VM → LSPQ → WP).

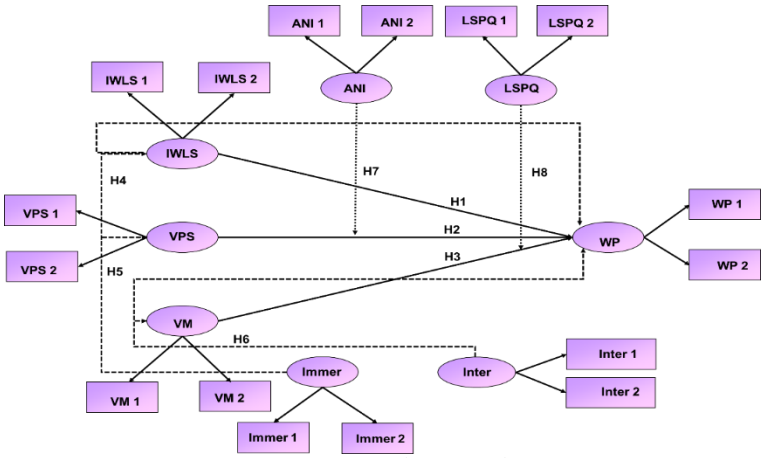

Fig. 1: Conceptual Framework.

3. Materials and methods

This section clearly explains the participant details who watch e-sports in live streaming with the help of structured questionnaires; data analysis of the collected data was performed using SEM. The methodology process is clearly outlined in Figure 2.

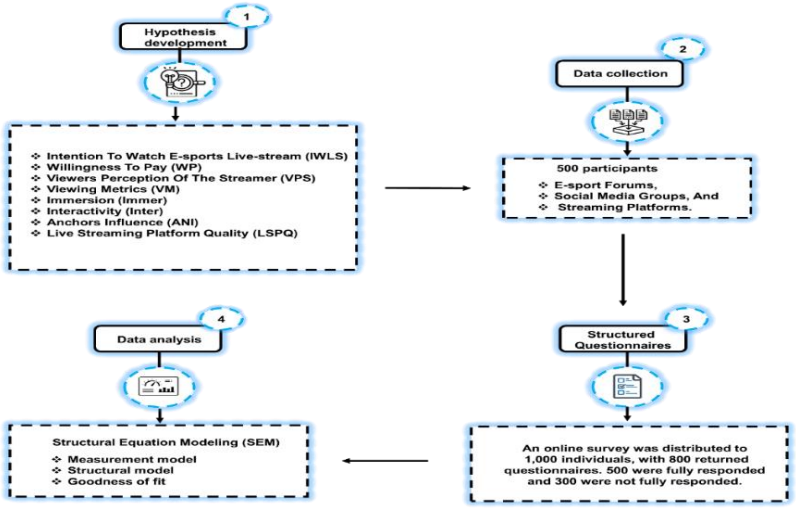

Fig. 2: Overview of Materials and Methods Section.

3.1. Participant's details

A total of 500 participants were recruited from a wide range of e-sport forums, social media groups, and streaming platforms. The data collected on demographic information, viewing habits, platform preferences, WP for content, views of streamers, and engagement through comments, as well as live chat, are described in Table 1.

Table 1: Font Specifications for A4 Papers

Demographic Feature	Category	Percentage (%)	Frequency (n=500)
Age	18-25 years	30	150
	26-30 years	40	200
	31-40 years	30	150
Gender	Male	55	275
	Female	45	225
Viewing Frequency	1 time a week	25	125
	2 times a week	40	200
	3 times a week	35	175
Platform Usage	Huya	40	200
	Douyu	35	175
	Twitch	25	125
Willingness to Pay	Membership	30	150
	Tipping the Host	35	175
	Ad-Free	35	175
Occupation	Teachers	30	150
	IT Employees	40	200
	Students	30	150
Education Level	High School	15	75
	Undergraduate	50	250
	Postgraduate	35	175

3.2. Structured questionnaires

An online survey was distributed to 1,000 individuals, with 800 returned questionnaires. 500 were fully responded and 300 were not fully responded. The survey was developed to assess eight variables: Intention to watch e-sports live-stream (IWLS), willingness to pay (WP), viewer's perception of the streamer (VPS), viewing metrics (VM), immersion (Immer), interactivity (Inter), anchor's influence (ANI) and live streaming platform quality (LSPQ). Each variable was measured by two questions determining the participant's approaches and behaviours towards the content. The survey's questions, which are shown in Table 2, were scored on a 5-point Likert scale ranging from "Strongly Disagree (1)" to "Strongly Agree (5)" to gauge viewer impressions and engagement levels.

Table 2: List of Questionnaires of Variables of E-Sports

Variable	Question 1	Question 2
IWLS	How frequently does the participant want to view live broadcasts of e-sports?	How likely is it that the participant will keep viewing live feeds of e-sports in the future?
WP	How willing is the participant to pay for a subscription to watch e-sports content?	What is the likelihood that the participant would tip streamers during live streams for additional content?
VPS	How positively does the participant perceive the personality of the streamer?	How much trust does the participant place in the streamer's expertise and opinions during the live stream?
VM	How frequently does the participant interact with the stream (e.g., commenting, chatting)?	How often does the participant watch e-sports live streams from start to finish without skipping any parts?
Immer	How engaged does the participant feel when watching e-sports live streams?	How often does watching e-sports live streams cause the participant to lose track of time?
Inter	How enjoyable is it for the participant to engage with the streamer through live chat or interactive features?	How much do interactive features (e.g., polls, Q&A) enhance the participant's enjoyment of the stream?
ANI	How much does the streamer's charisma influence the participant's decision to watch their live streams?	How much does the streamer's influence encourage the participant to provide financial support for their content?
LSPQ	How satisfied is the participant with the video quality and stream stability on the live streaming platform?	How simple is it for the participant to use the live-streaming platform's features and navigate?

3.3. Data analysis

IBM SPSS AMOS 26 was used to analyze the data, providing SEM, which looks at the connections between the variables. Along with the structural model, which quantifies the causal relationships between e-sports live-streaming variables when examining Immer, Inter, and LSPQ on user behaviour, the measurement model was used to establish the validity and reliability of the constructs, including intention to watch, WP, and viewer engagement. The goodness of fit indices were established to check whether the model was suitable for the data.
SEM is a powerful statistical tool that can be used to explore complex relationships between variables. It enables the analysis of both direct and indirect impacts in a line of study that uses structural models and measurement. SEM allows for investigating hypothesized correlations between observable and latent variables by combining component analysis and path analysis. In this research, SEM was used to examine user engagement in e-sports live streaming by examining the variables, like intention to watch, viewer perception, and platform quality, which affect a user's WP. Several fit indices were used to evaluate the model's fit, and it was evaluated to be an adequate model, as shown by Equation (1).

$$\eta_j = \alpha_\eta + A\eta_j + \Gamma\,\xi_j + \zeta_j \quad (1)$$

In equation (1), $\eta_j$represents the latent variable, A is the coefficient for the endogenous variable, Γ is the path coefficient, $\xi_j$is the exogenous variable, and ζ_j is the error term.
The measurement model for exploring e-sports live stream influences on users' WP, both direct and indirect effects, includes mediation and moderation factor variables. Finally, the marked variables indicators had factor loadings to the latent constructs. The model for the dependent variable WP and independent variables IWLS, VPS, and VM is modelled as follows in Equation (2).

$$z_j = \alpha_z + \Lambda_j + \Gamma\xi_j + \zeta_j \quad (2)$$

Where z_j represents the observed variables WP, VPS, and IWLS, ζ_j represents latent constructs, and Λ refers to the factor loadings. Similarly, the independent variable is shown in Equation (3).

$$w_j = \alpha_w + \Lambda_w\xi_j + \delta_j \quad (3)$$

Here, w_j refers to indicators of other variables like Inter and Immer, with the latent constructs. Equation (4) depicts the association between variables.

$$z_j = \alpha_z + Az_j + \Gamma w_j + \zeta_j \quad (4)$$

In equation (4), z_j represents the latent variable, $\alpha_z$as the intercept, A is the coefficient for the endogenous variable, Γ is the path coefficient, $w_j$is the exogenous variable, and $\zeta_j$is the error term.
The process of Immer and Intermediate involves the connections between the metrics of viewing and the WP. Also, the LSPQ and ANI moderate the relationships, which have effects on WP.
The structural model assesses the causal relationships of the variables impacting users' WP for e-sports live streaming directly and indirectly, with Immer and Inter as a mediator, and LSPQ and ANI as moderators. The model examined IWLS, VPS, and VM's impact WP. The Immer mediates the observed relationship, and the roles of LSPQ and ANI play as moderators to strengthen the relationship between IWLS, VPS, and VM with WP. The model is examined through an SEM to provide an assessment of the variables.

The goodness of fit is an essential part of SEM because it allows us to check whether the proposed model fits the observed data. Several fit indices indicate the adequacy of model fit. In SEM, the chi-square (χ^2), the null hypothesis that the model fits perfectly, is tested using a statistic; any value for χ^2 that is smaller indicates a better fit, as shown in Equation (5).

$$(M-1)E_{min} \tag{5}$$

In equation (5), $(M-1)$represents the number of model parameters, and E_{min} denotes the minimum error or residual in the model's optimization process
Degrees of Freedom (df) is determined by subtracting the number of estimated parameters from the number of observed variables, with sufficient fit requiring a larger ratio of df to the sample size.
RMSEA uses the degrees of freedom to evaluate the fit, and the values that are below 0.05 indicate a good fit by Equation (6).

$$RMSEA = \sqrt{\frac{\hat{\tau}}{Ndf_{model}}} \tag{6}$$

RMSEA measures model fit by comparing residuals $\hat{\tau}$to degrees of freedom $df_{model}$and sample size N, with lower values indicating better model fit.
Comparative fit index (CFI) has a higher cut-off midpoint or above the value of 0.90 indicating good model fit by using Equation (7).

$$CFI = 1 - \frac{\tau_{est.model}}{\tau_{indep.model}}$$

CFI evaluates model fit by comparing the chi-square values of the estimated model τ_(est model) to the independent model τ_(indep.model), where values closer to 1 indicate better fit.
The TLI (Tucker-Lewis Index), a satisfactory model fit, is likewise indicated by values better than 0.90; however, values of 0.08 or less were also acceptable for measuring the differences between the observed and projected variables used to create the SEM model; this is called standardized root mean square residual (SRMR). The aggregated fit indices aid in determining whether the SEM model presented an adequate representation of the data.

4. Results and discussions

This section demonstrates how the results of SEM models influence consumers' decisions to purchase subscriptions and view live e-sports streams.

4.1. Outcome of measurement model

The measurement model's validity and reliability are demonstrated in Table 3 and Figure 3, which also provide the important indices for each variable. With Cronbach Alpha values over 0.70 and composite reliability (CR) for all the variables, Immer has the greatest CR at 0.93. Average variance extracted (AVE) values also have >0.50, and Immer again descriptively has the highest AVE with 0.80. Cronbach's Alpha values suggest that the variables demonstrated good internal consistency, with values ranging from 0.81 to 0.89; both Immer and VM demonstrated good internal consistency.

Table 3: Reliability and Validity of Measurement Model

Variables	Item	Factor Loading	CR	AVE	Cronbach's Alpha
IWLS	IWLS1	0.85	0.90	0.75	0.85
	IWLS2	0.87			
WP	WP1	0.83	0.88	0.72	0.84
	WP2	0.81			
VPS	VPS1	0.82	0.87	0.71	0.83
	VPS2	0.84			
VM	VM1	0.88	0.91	0.77	0.86
	VM2	0.89			
Immer	Immer1	0.91	0.93	0.80	0.89
	Immer2	0.90			
Inter	Inter1	0.84	0.88	0.74	0.82
	Inter2	0.85			
ANI	ANI1	0.80	0.86	0.70	0.81
	ANI2	0.79			
LSPQ	LSPQ1	0.83	0.89	0.73	0.85
	LSPQ2	0.84			

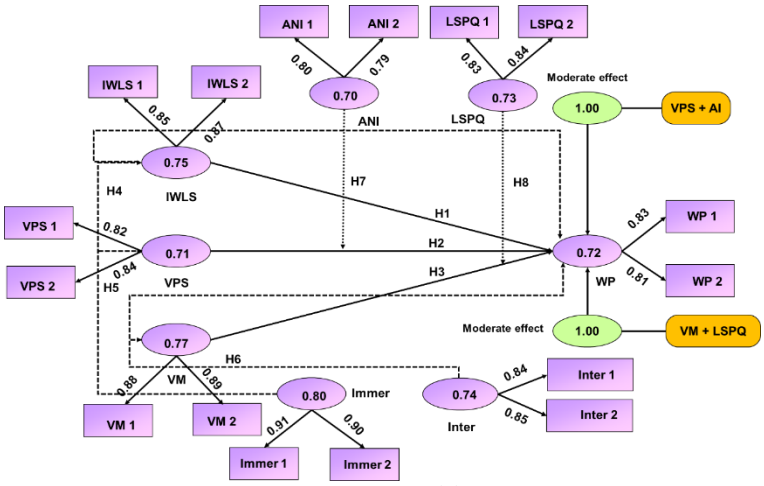

Fig. 3: Measurement Model Outcome.

Table 4 provides the square root of the AVE for each variable shown on the diagonal, demonstrating the measurement model's discriminant validity. The diagonal values range (0.866 to 0.91) are all greater than the off-diagonal correlations (0.42 to 0.60). This includes that the variables are different from each other. The highest discriminant validity is shown in Inter (0.91), with LSPQ (0.91) and Immer (0.89), demonstrating that the variables are sufficiently different.

Table 4: Discriminant Validity of Measurement Model

Variables	IWLS	WP	VPS	VM	Immer	Inter	ANI	LSPQ
IWLS	0.866	0.55	0.46	0.42	0.53	0.50	0.44	0.47
WP	0.55	0.88	0.47	0.51	0.52	0.48	0.49	0.50
VPS	0.46	0.47	0.86	0.48	0.51	0.52	0.54	0.53
VM	0.42	0.51	0.48	0.84	0.60	0.57	0.48	0.49
Immer	0.53	0.52	0.51	0.60	0.89	0.58	0.47	0.56
Inter	0.50	0.48	0.52	0.57	0.58	0.91	0.53	0.54
ANI	0.44	0.49	0.54	0.48	0.47	0.53	0.83	0.55
LSPQ	0.47	0.50	0.53	0.49	0.56	0.54	0.55	0.91

4.2. Structural model findings

The path estimates and statistical significance for the e-sports user engagement factors are shown in Table 5 and Figure 4. With p-values less than 0.05, the estimates for each hypothesis are statistically significant. The strongest estimate was for the path VM → WP (0.42), implying that viewing metrics significantly influenced users' WP. The mediating paths were also significant, including IWLS → Immer → WP (0.33) and VM → Inter → WP (0.38), emphasizing the important role of engagement factors in users‘ WP.

Table 5: Path Estimates and Statistical Significance for e-sports User Engagement Factors

Hypothesis	Path	Estimate	Std. Error	p-value
Direct connection				
H1: IWLS → WP	0.36	0.08	4.50	
H2: VPS → WP	0.28	0.07	4.00	< 0.05
H3: VM → WP	0.42	0.09	4.67	
Indirect connection				
H4: IWLS → Immer → WP	0.33	0.08	4.13	
H5: VPS → Immer → WP	0.30	0.07	4.29	
H6: VM → Inter → WP	0.38	0.08	4.75	< 0.05
H7: VPS → ANI → WP	0.25	0.06	4.17	
H8: VM → LSPQ → WP	0.27	0.07	3.86	

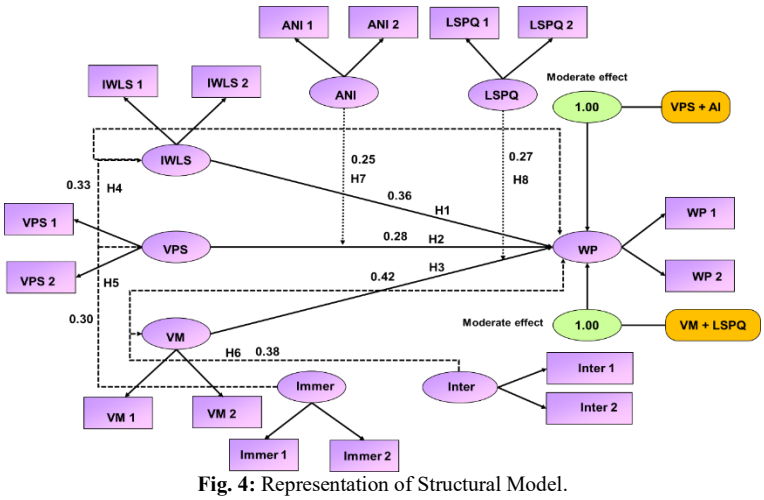

Fig. 4: Representation of Structural Model.

4.3. Result of goodness of fit

Table 6 presents the fit indices to assess the SEM adequacy. The model has a good fit in all indices presented. The Chi-Square (χ^2) test of 322.34 was below the maximum threshold of 5, indicating a good fit, while df has 142. The CFI (0.96) and TLI (0.94) being above the recommended threshold of 0.90 suggest that the model is stronger when confirmed with CFI and TLI being higher. The RMSEA (0.042) was below the threshold (< 0.05), and the Standardized SRMR (0.048) could distinguish an excellent fit of < 0.08, all confirming the model's adequacy.

Table 6: Fit Indices for Assessing the Structural Equation Model's Adequacy

Index	Value	Recommended Value
χ^2	322.34	< 5 (Good Fit)
df	142	
CFI	0.96	> 0.90 (Good Fit)
TLI	0.94	> 0.90 (Good Fit)
RMSEA	0.042	< 0.05 (Good Fit)
SRMR	0.048	< 0.08 (Good Fit)

The emotion network (EmotionNET) model was constrained by its reliance on facial emotion recognition, which may not allow for a comprehensive assessment of user experiences. It is limited to facial emotion recognition and therefore fails to sufficiently consider physiological responses, player modalities, and environmental influences. Thus, the model offers limited generalizability across contexts, given that emotional responses in virtual reality (VR) gaming can vary among users [19]. The introduction of e-sports into the Olympics has complications in governance, standardization, and equity/global fairness, in large part because the platforms for competitive gaming are not as well implemented and organized as traditional sports [20]. Due to the lack of well-recognized health and safety protocols, e-sports presented significant public health challenges as they were being considered for participation in the Games. Moreover, the social and economic disparities between e-sports players and traditional Olympic athletes have not been fully interrogated and raise significant issues regarding equity, fairness, and inclusivity. Based on the SEM result, there are critical variables that determine users' willingness to pay for e-sports live-stream content. The measurement model exhibited positive reliability and validity, with all variables passing the established cut-offs for composite reliability and the discriminant validity thresholds. Furthermore, the structural model also illustrated that VM was the most significant indicator of WP. It also demonstrated that Immer and Inter mediated the relationship between viewer engagement and payment intention. The goodness-of-fit indices, including Chi-Square, CFI, and RMSEA, showed that the model fit was good, confirming the prior results and the impacts, as well as the findings' generalizability as far as e-sports live-streaming tactics.

Recent studies demonstrate the changing impact of live streaming on consumer behavior, especially in the field of e-commerce. Li et al. (2025) demonstrate that scene-level features of e-commerce live streaming exert a significant effect on consumers' flow and purchase intentions toward sporting goods, thereby illustrating the value of immersive and engaging environments in enriching user experience [21]. Dong et al. (2022) likewise investigate the impact of live-streaming e-commerce on purchasing intentions for green agricultural products, highlighting the convergence of sustainability and interactive shopping experiences [22]. Xin et al. (2025) extend these findings by showing that atmospheric cues in live streaming can precipitate impulse buying, positioning this phenomenon within the framework of flow experiences [23]. These studies correspond with what the manuscript presents on the comprehensive effects of interactivity and immersion in enhancing user engagement and user willingness to pay in e-sports live streaming, and the overall repercussion of live streaming in various markets.

The study focused on the main concepts of being immersive, interactive, and using the quality of the platform that needs attention in all fields. For example, educational sites might increase interest and willingness to pay by incorporating an immersive aspect, such as gamification, like how e-sports engage viewers through interaction. Technical performance, such as smooth streaming and user-friendly navigation systems, is crucial in products like online education and virtual conferencing, as it impacts user retention and profitability. Additionally, the influence of content creators is significant in various industries, as one-on-one interaction and brand loyalty can drive audience engagement, and relatability should be paired with high-quality content. The research findings can be applied to any digital field, shedding light on brand impact on user intent and emotional connection in digital marketing strategies, and enhancing user experience in digital settings. This indicates the generalizability of the research findings beyond the e-sports domain to a broader context of digital marketing research.

The present study employed a sample of 500 respondents, most of whom (90%) fell within the age bracket of 18–40, with a male proportion of 55%, potentially introducing demographic bias given the heterogeneous composition of e-sports spectators worldwide. This limitation underscores the necessity of investigating the influence of age, gender, and cultural context on willingness to pay (WP) for premium content. Those between the ages of 18 and 24 may show a higher WP due to their tendency to conduct digital transactions regularly, unlike older viewers who may have different spending patterns due to financial obligations. Gender differences are also significant; the increasing female audience in e-sports suggests varying levels of participation and interests affecting WP. Cultural perspectives can also impact the e-sports experience, as some cultures view gaming as recreation rather than a sporting event, influencing how participants perceive the value of premium content. Small-scale studies would benefit from including these demographic variables to enhance understanding of user engagement. Future studies should aim for a broader sample to increase the external validity of findings among the global e-sports audience.

SEM offers a meaningful conceptual model of the relations between many factors affecting the willingness of users to pay for e-sports streaming. Instead of getting bogged down in the technical details of the equations, it's more impactful to focus on what they reveal about viewer behavior. For example, SEM demonstrates that immersion and interactivity are important in improving engagement, which in turn is significant in stimulating willingness to pay. This is crucial for streamers and platform developers because it emphasizes the importance of producing rich content with interesting and influential information that motivates the audience to participate. By using the results of SEM analyses, stakeholders will be able to eliminate actions that lower the user experience, such as optimizing streaming quality and interactive features, thus enhancing viewer satisfaction and attracting more revenue potential.

The findings of this study have been successfully applied to other forms of digital content, such as live music streaming and membership webinars. In the context of live music streaming, creating immersive and captivating experiences with high-quality features can enhance viewer engagement and increase the likelihood of purchasing concert tickets or merchandise. Just as viewers of e-sports streams are influenced by interactions with streamers and community engagement, music fans may be more inclined to support artists through donations or subscriptions if they feel connected to the performance and the artist's personality. Likewise, in educational webinars, interactivity and immersion are key factors in influencing participant engagement and learning outcomes. By incorporating interactive elements such as live Q&A sessions, polls, and instant responses, educational platforms can enhance the learning experience and potentially increase willingness to invest in premium courses or additional content. Supporting community and collaboration can also improve user satisfaction and

retention, as demonstrated in e-sports live streaming. These findings underscore the importance of quality, interactivity, and immersive experiences across various forms of digital content, ultimately leading to increased engagement, satisfaction, and financial support from users.

The future directions of this research can benefit from exploring specific research questions that delve deeper into user willingness to pay in e-sports streaming. For example, an exploratory study into the role of cultural differences in the perception of WP may present a good idea to develop content and strategies for engaging a more diverse audience. Additionally, we can use machine learning algorithms to forecast how users will be engaged based on real-time data of user interactions and better understand their behavior and preferences. Examining platform-specific features, such as Twitch's emotes or Huya's gifting systems, would shed light on how these unique elements impact WP. Furthermore, while the study indicates practical solutions such as platform optimization and streamer training, it is possible to delve deeper into the research and cite successful cases that demonstrate effective methods of capturing the audience and earning more money. Such a holistic solution would not only contribute to academic discourse but also provide industry stakeholders with practical solutions.

5. Conclusion

This research examines the factors that influence e-sports viewers' intentions to pay for premium live-streaming content. the 500 participants, all e-sports viewers, were recruited through an online survey with the help of eight variables to measure the factors that influence e-sports viewers' Wp for premium live-streaming content: IWLS, wp, VPS, VM, immer, inter, ANI, and lspq. the Sem model, which includes the measurement model, structural model, and goodness of fit, was used to analyze the relationships among these variables. the main findings indicated that iwls ($\beta = 0.36$), vps ($\beta = 0.28$), and vm ($\beta = 0.42$) all positively ($p < 0.05$) influenced wp. Immer was a mediator of the effect of Iwls on WP ($\beta = 0.33$, $p < 0.05$), while inter was a mediator of the influence of VM on WP ($\beta = 0.38$, $p < 0.05$). finally, ani and lspq functioned as moderators between engagement and wp, which further reveals the impact of both engagements from viewers and the quality of streaming platforms provided in live-streaming content.

it included one specific demographic of e-sport viewers on assigned platforms, limiting generalizability. the data were self-reported survey data and had the possibility of being affected by self-selection bias as it pertained to engagement and WP. future research could explore a bigger sample across several geographic regions and demographic groupings. future research could also examine the role of new technologies, such as VR, in e-sports live-streaming engagement and WP.

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