

Engagement and Consumption Behavior in *Gacha* Games

A PLS-SEM Study on Generation Z in Indonesia

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Abstract— *Gacha* games have gained popularity as a free-to-play model, sparking increasing interest in player consumption behavior. Understanding this behavior is critical, as it has implications for player retention, monetization strategies, and potential risks of compulsive spending. While existing studies largely focus on purchase intention, other consumption behaviors—such as co-production, community engagement, word-of-mouth, and recruitment—remain underexplored. This study aims to examine how player engagement in *Genshin Impact* affects these various forms of consumption behavior. Focusing on Generation Z in Indonesia—a digitally native cohort deeply immersed in mobile gaming—the research employs Partial Least Squares Structural Equation Modeling (PLS-SEM) with data from 344 respondents who have played the game for at least six months. Findings reveal that satisfaction through games, game personalization, and game social interaction significantly influence player engagement, which in turn positively affects multiple dimensions of consumption behavior. These results offer practical insights for game developers and marketers seeking to foster sustainable and ethical engagement strategies in *gacha* games.

Keywords—*gacha* games, free-to-play, consumption behavior, purchase intention, community engagement, Social Exchange Theory, Generation Z, PLS-SEM.

I. INTRODUCTION

The gaming industry has grown rapidly and has emerged as a new leader in the entertainment world, even surpassing the film and music industries [1]. One of the most popular game models is *gacha* games, which use a free-to-play (F2P) model.

Understanding player consumption behavior in *gacha* games is important due to its financial, psychological, and social implications. These behaviors influence not only revenue generation but also the dynamics of player loyalty, peer influence, and the development of gaming communities. While much of the existing research has focused on purchase intention, other forms of consumption—such as co-creation, community engagement, and word-of-mouth—remain underexplored. Investigating these behaviors offers a more complete picture of how players interact with and contribute to game ecosystems.

Games like *Genshin Impact* allow players to obtain items randomly through *gacha* mechanics with certain probabilities, providing players with a chance to acquire specific rewards at random [2]. The popularity of these games continues to rise, with *Genshin Impact* becoming one of the highest-grossing games globally. However, academic research on player consumption behavior remains very limited. Most existing studies focus on purchase intention [3] [4], while other consumption behaviors such as co-production, community engagement, and word-of-mouth are often overlooked. Therefore, this study aims to explore how player engagement influences consumption behavior, particularly in the context of *Genshin Impact* among Generation Z in Indonesia.

This study adopts Social Exchange Theory as its main theoretical lens and uses Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the relationships between engagement and multiple forms of consumption behaviour. This study seeks to address several key questions, including how satisfaction through games, game personalization, and game social interaction influence player engagement in *Genshin Impact*. Additionally, this research aims to examine how player engagement impacts broader consumption behaviors such as purchase intention, co-production, community engagement, and word-of-mouth [5] [6].

The objectives of this study are, first, to identify the influence of satisfaction through games, game personalization, and game social interaction on player engagement. Second, to explore the impact of engagement on various dimensions of consumption behavior, such as purchase intention, co-production, community engagement, and word-of-mouth, in the context of *Genshin Impact* among Generation Z in Indonesia.

II. LITERATURE REVIEW AND HYPOTHESES

As the theoretical foundation, this study employs Social Exchange Theory (SET), which explains that players who feel engaged in a relationship—in this case, with the game—will respond with mutually beneficial behaviors such as co-production and word-of-mouth [5]. This theory describes interactions between individuals and organizations, where individuals will respond positively if they perceive that the benefits outweigh the costs [7]. Additionally, this study also utilizes the Uses and Gratifications Theory to understand how engagement is formed through the satisfaction obtained by

players [8], and the Service-Dominant Logic which emphasizes interactivity in value creation [9].

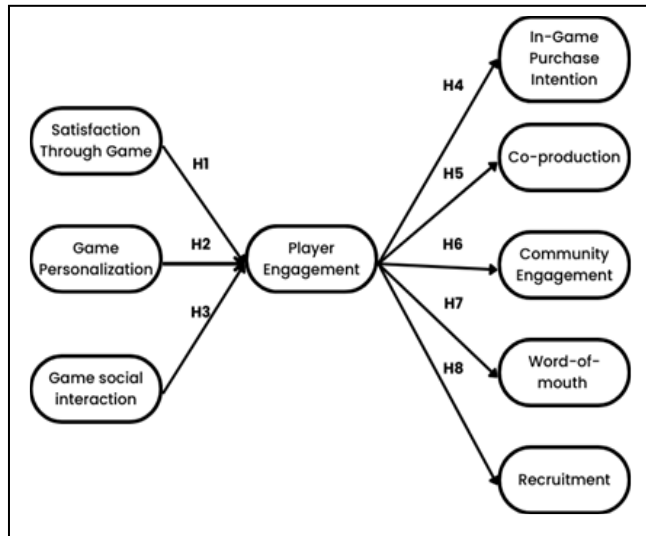


Fig. 1. Research Conceptual Model

This study tests eight hypotheses, each of which is elaborated below. Figure 1 presents a summary of the hypotheses in the form of the research conceptual model.

Satisfaction through games plays a crucial role in shaping player engagement. When players feel satisfied with their gaming experience, it creates a stronger emotional bond, encouraging them to remain engaged with the game. Reference [6] shows that gaming satisfaction enhances player engagement. In Genshin Impact, elements such as enjoyment, an engaging storyline, and satisfying graphic design enhance the gaming experience [10], thereby strengthening player engagement. Therefore, this study hypothesizes that satisfaction through games has a positive and significant effect on player engagement.

Hypothesis 1: Satisfaction Through Games increases Player Engagement

Game personalization, such as the ability to customize characters, items, and graphic settings, can enhance engagement by allowing players to feel a sense of ownership and personalization in the game. Research shows that higher game personalization increases player engagement [5] [6]. In the context of Genshin Impact, features such as character selection, graphical adjustments, and the ability to tailor other gaming experiences provide players with opportunities to feel more connected to the game, ultimately increasing engagement. Based on these findings, this hypothesis states that game personalization has a positive and significant effect on player engagement.

Hypothesis 2: Game Personalization increases Player Engagement

Social interactions that occur within the game, such as playing with friends or communicating with other players, are important factors that drive engagement. Previous studies indicate that social interactions in online games, including multiplayer games like Genshin Impact, increase player engagement through the exchange of ideas, experiences, and shared achievements [6]. The multiplayer feature in Genshin Impact allows players to collaborate and compete, strengthening social relationships and encouraging further

engagement [10]. Therefore, this hypothesis proposes that game social interaction has a positive and significant effect on player engagement.

Hypothesis 3: Game Social Interaction increases Player Engagement

Player engagement plays a crucial role in influencing purchase intention within the game. The higher the engagement level, the greater the likelihood that players will make in-game purchases to enhance their gaming experience [11]. Subsequently, References [5] and [12] shows that engagement is significantly related to purchase intention in the context of online games. In Genshin Impact, highly engaged players tend to purchase virtual items to improve their performance or enhance their characters, indicating that engagement drives purchase intention. Based on this, the study proposes the hypothesis that player engagement has a positive and significant effect on purchase intention.

Hypothesis 4: Player Engagement increases In-Game Purchase Intention

Co-production occurs when players participate in game content development, such as providing feedback or contributing to the gaming community. Reference [5] proposes that engagement facilitates active participation in co-production, where more engaged players tend to contribute to game modification and development [13]. In Genshin Impact, players can be involved in co-production by participating in online communities and interacting with game developers through forums and suggestions for improvements. Based on this, the fifth hypothesis states that player engagement has a positive and significant effect on co-production.

Hypothesis 5: Player Engagement increases Player Co-production

Players who are actively engaged with a game are also more likely to be active in the game-related community. Reference [5] noted that engagement encourages community participation, where players who are more engaged with a game tend to interact more socially with other players within the community. In Genshin Impact, the player community engages through social media platforms and forums that allow them to share experiences and gaming strategies [14]. Based on this, this hypothesis proposes that player engagement has a positive and significant effect on community engagement.

Hypothesis 6: Player Engagement increases Community Engagement

Player engagement encourages players to share their gaming experiences with others through word-of-mouth. Previous research [5] found that high engagement levels drive verbal information-sharing behavior, where more engaged players are more likely to recommend the game to others. In the context of Genshin Impact, actively engaged players frequently share reviews or recommendations about the game with friends or on social media, thereby expanding the game's reach through word-of-mouth. Based on this, the seventh hypothesis states that player engagement has a positive and significant effect on word-of-mouth.

Hypothesis 7: Player Engagement increases Player Word-of-Mouth

Recruitment refers to players' willingness to invite others, such as friends or family, to play the game. Reference [5]

demonstrates that high engagement influences players' intentions to recruit others into the game. In E-sport games, engaged players are more likely to invite others to join, either through direct referrals or through referral programs [15]. Therefore, the final hypothesis states that player engagement has a positive and significant effect on player recruitment in Genshin Impact.

Hypothesis 8: *Player Engagement increases Player Recruitment*

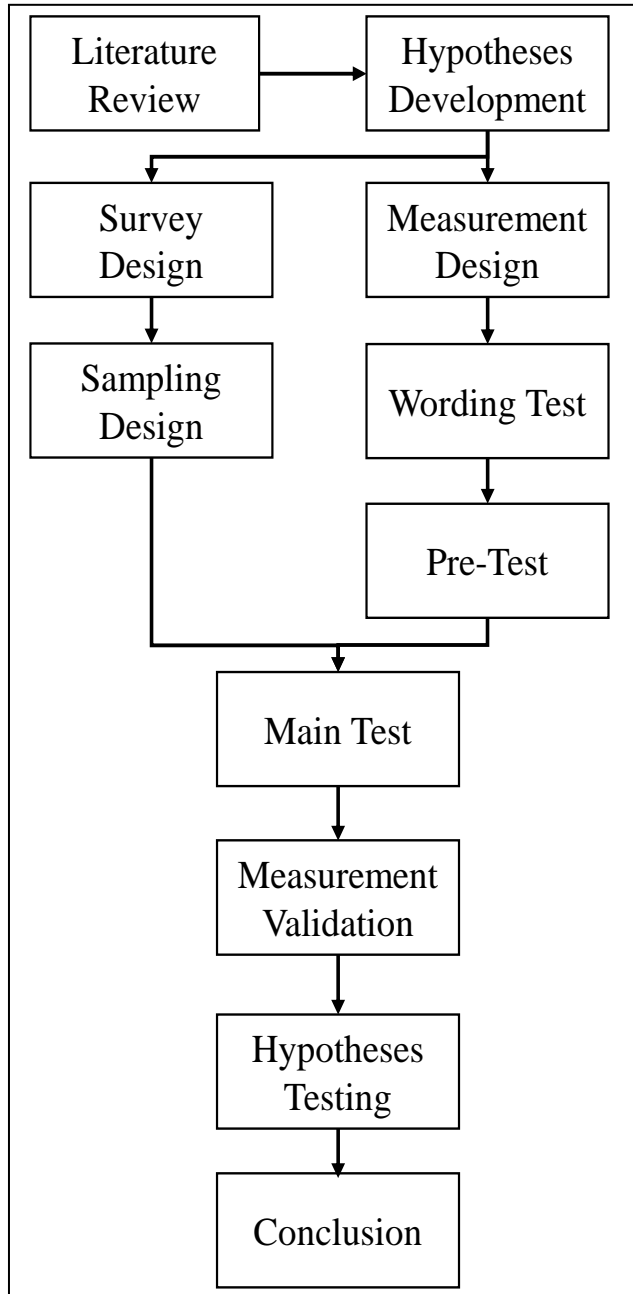


Fig. 2. Flowchart of The Research Process

III. RESEARCH METHODOLOGY

This study employs a quantitative research method, collecting data through a survey distributed to 344 Generation Z respondents in Indonesia who have played Genshin Impact for at least six months. The data is analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to explore the relationships between player engagement and consumption behaviors, such as purchase intention, co-

production, community engagement, and word-of-mouth. Figure 2 shows the research process of this study.

The expected benefits of this study include contributing to the academic literature on consumer behavior in gacha games, particularly in the context of player engagement and its influence on various aspects of consumption. Additionally, this research aims to provide insights for game developers regarding elements that can enhance player engagement, ultimately driving consumption behaviors such as purchase intention and word-of-mouth.

A. Data Collection

This study utilized a non-probability sampling method, specifically purposive sampling, to select respondents who met the research criteria. The online survey was distributed through social media and online gaming communities. To encourage participation, an incentive was provided in the form of game vouchers for 10 randomly selected respondents. A screening process was implemented to ensure that only eligible participants took part in the study. The purposive sampling criteria included Generation Z individuals aged 18 years and above, Indonesian citizens, active Genshin Impact players for at least the past six months, and members of a Genshin Impact gaming community.

B. Measurements

This study measures several key variables related to engagement and consumption behavior in Genshin Impact. Satisfaction through games is measured using the scale developed in Reference [6], assessing the extent to which players feel satisfied with their gaming experience. Game personalization is measured using an adapted scale from Reference [6], evaluating players' ability to customize in-game features according to their personal preferences. Game social interaction is assessed using a scale adapted from Reference [16] which measures social interactions between players within the game context.

Player engagement is measured using a multidimensional scale from Reference [5], encompassing cognitive, emotional, and behavioral aspects of player involvement with the game. For purchase intention, the measurement tool is adapted from Reference [3], assessing players' intentions to purchase in-game items. Co-production, community engagement, word-of-mouth, and recruitment are measured using the scale developed in Reference [5], evaluating player involvement in content development, participation in the community, sharing information about the game, and inviting others to play. A detailed operationalization of the variables can be found in the Appendix.

C. Respondent Profile

During the data collection stage, 377 respondents were initially gathered. After data cleaning—removing responses from participants who were younger than 18 years or older than 29 years, as well as those who had played Genshin Impact for less than six months—the final dataset consisted of 344 valid responses. The respondent profile includes gender, age, gaming duration, length of gameplay experience, in-game purchases over the past six months, and average monthly entertainment expenditure. Of the 344 respondents, 57% were male (196 individuals), and 43% were female (148 individuals).

The respondents' ages ranged from 17 to 27 years, with the majority being 19 years old (20.64%), followed by 22 years old (14.83%) and 20 years old (12.79%). In terms of gaming duration, most respondents played for 1-3 hours (46%) per week over the last six months. Additionally, players with more than 24 months of experience (64.24%) comprised the majority of the study's respondents.

Regarding geographic distribution, most respondents resided in Java, specifically in Jakarta (27.91%), Greater Jakarta (26.74%), and other parts of Java (30.52%). In terms of in-game purchases, most respondents spent between Rp 1 - Rp 500,000 per month (43.9%), followed by those who did not spend at all (37.79%).

TABLE I. RESPONDENT PROFILE

Attribute	Respondent Profile		
	Category	Count	Percent
Gender	Male	196	56.98%
	Female	148	43.02%
Gaming Duration	<1 hour	40	11.43%
	1 - 3 hours	161	46.00%
	3 - 6 hours	86	24.57%
	>6 hours	63	18.00%
Age	18-20 years	169	49.13%
	21-24 years	135	39.24%
	25-27 years	40	11.63%
Length of Gameplay Experience	6 - 12 months	40	11.63%
	13 - 24 months	83	24.13%
	> 24 months	221	64.24%
In-Game Purchases in the Last 6 Months	Rp0	130	37.79%
	Rp 1 - Rp 500,000	151	43.90%
	Rp 500,001 - Rp 1,500,000	43	12.50%
	Rp 1,500,001 - Rp 2,500,000	9	2.62%
	> Rp 2,500,000	11	3.20%
Average Monthly Entertainment Expenditure	Rp0	76	22.09%
	Rp 1 - Rp 500,000	216	62.79%
	Rp 500,001 - Rp 1,500,000	39	11.34%
	Rp 1,500,001 - Rp 2,500,000	5	1.45%
	> Rp 2,500,000	8	2.33%
Residence	Jakarta	96	27.91%
	Greater Jakarta	92	26.74%
	Java (Except Greater Jakarta)	105	30.52%
	Outside Java - Western Indonesia	31	9.01%
	Outside Java - Central Indonesia	13	3.78%
	Outside Java - Eastern Indonesia	7	2.03%

D. Data Analysis

PLS-SEM was chosen as the analysis method due to the non-normal distribution of data. This study aims to test an

existing model while also incorporating an exploratory approach by integrating existing models into a new model. The study conducted convergent validity, discriminant validity, and reliability tests using AVE, Composite Reliability, and Cronbach's Alpha. To address potential biases, a Harman's single-factor test was conducted to check for common method bias (CMB), and the results indicated no significant CMB presence. Additionally, questionnaire wording was carefully designed and tested to keep a neutral tone and minimize social desirability bias.

IV. RESULTS AND DISCUSSIONS

A. Results

The first step to assess the relationship between indicators and latent variables involves conducting a measurement model analysis. This process consists of three stages: internal consistency, convergent validity, and discriminant validity.

Internal consistency reflects the degree of reliability of each indicator within a construct. The parameters used to evaluate internal consistency are composite reliability and Cronbach's alpha. A construct is deemed reliable if its Cronbach's alpha value exceeds 0.6 and its composite reliability surpasses 0.7. The analysis results are presented in Table 2.

TABLE II. RESULT OF RELIABILITY AND VALIDITY TEST PARAMETERS

Variables	Reliability and Validity		
	CA	CR	AVE
Satisfaction Through Game (STG)	0.885	0.917	0.690
Game Personalization (GP)	0.642	0.783	0.523
Game Social Interaction (GSI)	0.777	0.848	0.530
Player Engagement (PE)	0.711	0.810	0.627
In-Game Purchase Intention (IGP)	0.893	0.923	0.706
Community Engagement (CE)	0.867	0.911	0.720
Co-production (CP)	0.867	0.909	0.715
Word of Mouth (WOM)	0.915	0.936	0.746
Player Recruitment (PRC)	0.936	0.952	0.800
Satisfaction Through Game	0.885	0.917	0.690

Based on the Table 2, the dataset meets the required thresholds, with Cronbach's alpha values exceeding 0.6 and composite reliability values surpassing 0.7. Furthermore, convergent validity assesses the legitimacy of constructs and their corresponding indicators. This validity is determined using the Average Variance Extracted (AVE), which must be equal to or greater than 0.5, and outer loading values, which should exceed 0.7. Consequently, all constructs are considered valid and reliable and ready for further analysis.

Discriminant validity was subsequently evaluated using two approaches: the Fornell-Larcker criterion and the Hetero Trait-Mono Trait (HTMT) ratio. The Fornell-Larcker criterion compares the square root of AVE values with latent variable correlations. The square root of the AVE for each construct should exceed its correlation with other constructs. Additionally, the HTMT index can be used to assess discriminant validity. A value below 0.9 for conceptually

similar constructs indicates sufficient discriminant validity. The results are displayed in Table 3.

In conclusion, the results confirm that the model meets the reliability and validity criteria. All constructs exhibit acceptable internal consistency, convergent validity, and discriminant validity, ensuring the robustness of the measurement model.

To assess the extent to which exogenous variables explain endogenous variables, the coefficient of determination (R^2) is examined. An R^2 value between 0.5 and 0.7 is considered strong, while values below 0.5 indicate weaker explanatory power. The analysis shows that Player Engagement (PE) has the highest R^2 value of 0.491, with an adjusted R^2 of 0.486, suggesting that this construct has the strongest predictive accuracy among the variables analyzed. Other constructs exhibit lower R^2 values, indicating varying levels of explanatory power.

TABLE III. HTMT RESULT

Var.	Table Column Head							
	STG	GP	GSI	PE	IGP	CE	CP	WOM
GP	0.71							
GSI	0.47	0.46						
PE	0.8	0.88	0.55					
IGP	0.37	0.51	0.4	0.59				
CE	0.25	0.29	0.63	0.48	0.39			
CP	0.31	0.32	0.52	0.52	0.35	0.66		
WOM	0.63	0.6	0.52	0.72	0.46	0.45	0.48	
PRC	0.51	0.61	0.54	0.63	0.45	0.45	0.44	0.72

Similarly, the predictive relevance of the model is assessed using the Stone-Geisser Q^2 indicator, which evaluates whether exogenous latent variables effectively predict their corresponding endogenous variables. A Q^2 value greater than zero indicates predictive relevance. The results show that all exogenous latent variables contribute positively to the prediction of their respective endogenous variables, with Player Engagement (PE) again exhibiting the highest predictive relevance ($Q^2 = 0.293$), followed by Word of Mouth ($Q^2 = 0.244$) and Recruitment ($Q^2 = 0.205$). The combined analysis of R^2 and Q^2 values for the constructs under study is shown in Table 4.

TABLE IV. DETERMINATION COEFFICIENTS AND PREDICTIVE RELEVANCE

Variables	Parameters		
	R^2	R^2 Adjusted	Q^2
Player Engagement	0.491	0.486	0.293
In Game Purchase Intention	0.219	0.217	0.153
Community Engagement	0.146	0.143	0.101
Co-production	0.166	0.164	0.116
Word of Mouth	0.333	0.331	0.244
Recruitment	0.260	0.258	0.205

Additionally, the effect size (f^2) analysis evaluates changes in R^2 when specific exogenous constructs are removed,

indicating their substantive impact on endogenous constructs. Importantly, f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. The results indicate that Game Personalization (GP) has the highest effect size ($f^2 = 0.420$), suggesting it has the most substantial impact among the constructs. This is followed by Satisfaction Through Game (STG) with an f^2 value of 0.234, while Game Social Interaction (GSI) has the lowest effect size at 0.123, indicating a comparatively smaller effect on the endogenous variables.

TABLE V. EFFECT SIZE (F^2) PARAMETERS

Variables	Effects Size					
	PE	IGP	CE	CP	WOM	RC
STG	0.234					
GSI	0.123					
GP	0.420					
PE		0.281	0.170	0.199	0.499	0.352

Overall, these findings indicate that Player Engagement (PE) has the strongest explanatory power and predictive relevance among the studied constructs, while Game Personalization (GP) exerts the most significant effect on other variables in the model. The results underscore the varying influences of different constructs on engagement, purchase intention, and word-of-mouth dynamics within the gaming context.

TABLE VI. HYPOTHESES TESTING

No	Hypotheses Testing		
	Hypotheses	Beta	t-values
H ₁	Satisfaction through games increases player engagement	0.417	6.746
H ₂	Game personalization increases player engagement	0.292	6.311
H ₃	Game social interaction increases player engagement	0.161	3.618
H ₄	Player engagement increases in-game purchase intention	0.468	11.146
H ₅	Player engagement increases co-production	0.382	7.896
H ₆	Player engagement increases community engagement	0.408	8.278
H ₇	Player engagement increases word-of-mouth	0.577	14.213
H ₈	Player engagement increases player recruitment	0.510	11.890

This study tested eight hypotheses, with the results summarized in Table 6. The hypothesis testing for the first hypothesis (H1) indicates that Satisfaction Through Games has a positive and significant effect on Player Engagement in Genshin Impact, with a t-value of 6.746. The more satisfied players are with the game, the higher their level of engagement. This finding aligns with previous research in Reference [6], which also found that gaming satisfaction significantly enhances player engagement.

The second hypothesis (H2) on Game Personalization also received support, with a t-value of 6.311. This finding suggests that the higher the level of personalization in the game, the greater the player engagement with Genshin Impact. Prior research in Reference [6] also supports this conclusion, indicating that game personalization features can enhance player engagement.

Next, the third hypothesis (H3) on Game Social Interaction yielded a t-value of 3.618, indicating a positive and significant influence of in-game social interactions on player engagement. The more social interactions occur within the game, the higher the level of player engagement.

The fourth hypothesis (H4) regarding the effect of Player Engagement on In-Game Purchase Intention showed a t-value of 11.146, demonstrating a positive and significant relationship. Players who are more emotionally and cognitively engaged with the game tend to have a stronger purchase intention. This result aligns with the study shown in Reference [5].

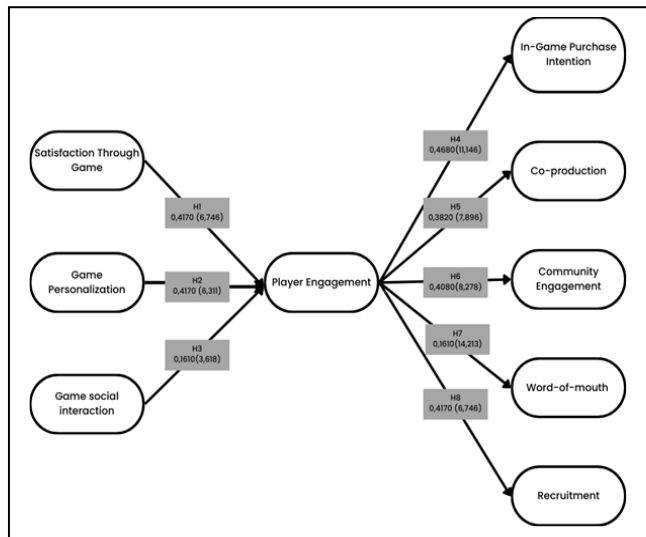


Fig. 3. Recapitulation of the hypotheses testing results

For the fifth hypothesis (H5), Player Engagement was also found to significantly influence Co-Production, with a t-value of 7.896. Highly engaged players are more likely to contribute to co-production activities, such as providing feedback for game development.

In the sixth hypothesis (H6), Player Engagement was shown to have a positive effect on Community Engagement, with a t-value of 8.278. Players who are more engaged with the game tend to be more active in gaming communities.

The seventh hypothesis (H7) on the impact of Player Engagement on Word-of-Mouth revealed a t-value of 14.213, indicating that highly engaged players are more likely to share positive information about the game with others.

Finally, the eighth hypothesis (H8) on the effect of Player Engagement on Recruitment recorded a t-value of 11.890. Players who are more engaged with Genshin Impact are more likely to recruit new players, supporting previous findings by Reference [5]. Figure 3 presents a summary of the hypothesis testing results.

B. Discussions

This study provides significant insights into the factors influencing player engagement in Genshin Impact and the broader implications of these findings. From a theoretical perspective, the results reinforce existing literature on player engagement and satisfaction in the gaming context. Specifically, the positive relationship between player satisfaction and engagement highlights the crucial role of a positive gaming experience in capturing players' attention and fostering their loyalty. These findings align with customer

experience theory, which emphasizes the importance of positive experiences in driving higher engagement and satisfaction, ultimately shaping purchasing behavior and participation in gaming communities [17][18].

The connection between engagement and in-game purchase intention further substantiates the argument that a well-designed gaming experience can encourage continued participation and spending. In addition, game personalization emerges as a key factor in influencing engagement, lending support to theories of self-determination and intrinsic motivation that suggest players are more likely to engage with content that resonates with their personal preferences and play styles. This suggests that developers who implement tailored experiences contribute not only to greater engagement but also to long-term commitment and financial investment from players.

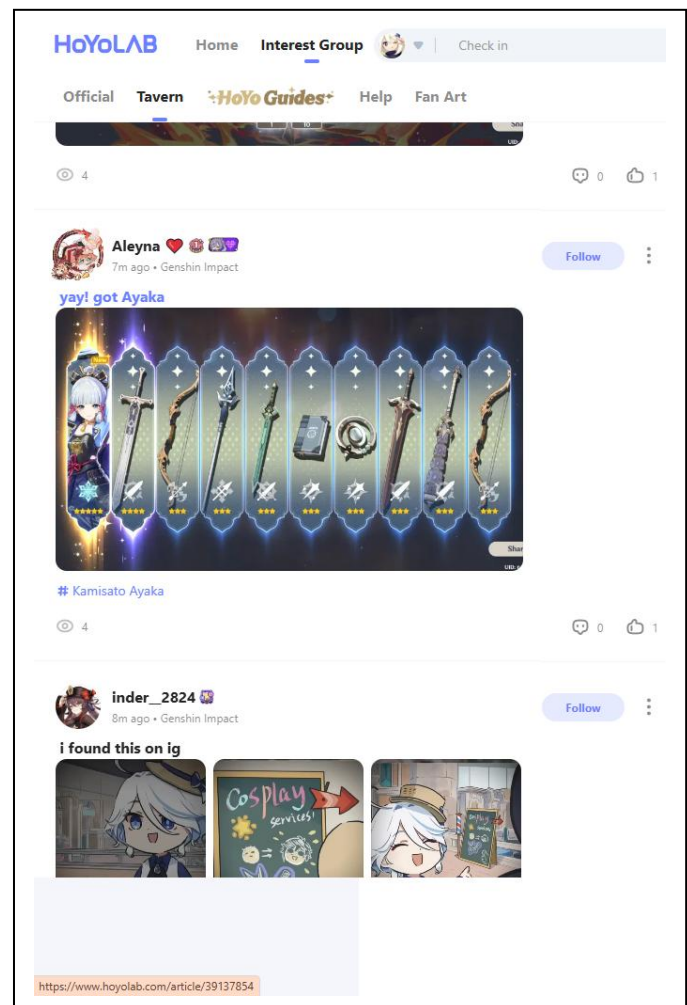


Fig. 4. Community engagement in a player forum run by Hoyolab

The managerial implications of this study are highly relevant for game developers and marketers. Understanding that player satisfaction and game personalization directly impact engagement allows developers to focus on enhancing these elements in their game design. For instance, developers could consider implementing more sophisticated personalization features and tailoring gameplay experiences to match individual player preferences. This might include adaptive difficulty settings, content recommendations based on past behavior, or allowing players greater control over their in-game experiences. Additionally, fostering an environment

that supports social interaction can further boost player engagement. This suggests that developers should invest in systems and features that facilitate collaboration and interaction among players, such as community forums, in-game events, or multiplayer mechanics that encourage teamwork and relationship-building. By doing so, game developers can strengthen player retention and increase the likelihood of in-game purchases. Marketers, on the other hand, can leverage these insights to design campaigns that emphasize the social and personalized aspects of the game, highlighting how engagement can be enhanced through active participation in the community and customized gameplay experiences.

Beyond commercial interests, the findings of this study hold social implications as well. Figure 4 demonstrates how players engage in a community forum run by Hoyolab. Engagement in gaming is not merely a solitary experience; rather, it contributes to the formation of strong social communities among players. Social interactions within the game can lead to deeper social bonds, which not only enhance the gaming experience but may also have positive effects on players' overall well-being. This aligns with prior research that suggests online gaming communities can serve as social support systems, particularly for individuals who may struggle with forming connections in traditional social settings [15]. The interactive and cooperative nature of gaming, particularly in massively multiplayer online role-playing games (MMORPGs) like Genshin Impact, provides opportunities for collaboration, teamwork, and even cross-cultural exchange among players from diverse backgrounds. As a result, game developers and marketers should acknowledge their social responsibility by creating safe and inclusive spaces for all players while encouraging positive and meaningful interactions. This includes implementing mechanisms to prevent toxicity, harassment, and exploitative gaming practices that could negatively impact player experiences. Community moderation tools, reporting systems, and codes of conduct can all contribute to fostering a healthier gaming environment that prioritizes player well-being.

From an ethical standpoint, the implications of this study raise important concerns about the monetization strategies employed by game developers. While engagement and in-game purchase intention are closely linked, there is a fine line between encouraging spending through engaging experiences and fostering compulsive or exploitative spending behaviors [17]. The presence of loot boxes, gacha mechanics, and other forms of randomized in-game purchases has sparked ongoing debates about the ethicality of such systems, particularly when targeting younger players [10]. Developers must strike a balance between designing engaging experiences that naturally encourage spending and implementing monetization practices that do not manipulate or pressure players into excessive financial commitments. Transparency in pricing models, clear disclosure of probabilities for randomized items, and the inclusion of spending limits or parental controls are all measures that can contribute to more ethical monetization strategies. Furthermore, regulatory bodies in various countries have begun scrutinizing these practices, with some jurisdictions already implementing restrictions on loot boxes due to concerns about their resemblance to gambling [20]. Given these developments, game developers must proactively consider the ethical implications of their monetization strategies to avoid potential legal and reputational risks.

While this study provides meaningful contributions to understanding player engagement in gaming, several limitations must be acknowledged. First, its focus on a single game, Genshin Impact, may limit the generalizability of the findings to other gaming contexts. Factors influencing player engagement can vary depending on the game's genre, target audience, and monetization model. For example, engagement drivers in competitive esports titles may differ significantly from those in narrative-driven role-playing games [15]. Future research could expand upon this study by examining multiple games across different genres to identify patterns and distinctions in engagement determinants. Second, although the bootstrapping method employed provides a robust analysis, survey-based data collection may still be subject to response bias, such as participants' tendency to provide socially desirable answers. Future studies may benefit from incorporating behavioral data, such as in-game analytics, to complement self-reported measures and offer a more objective assessment of player engagement. Additionally, qualitative methodologies, such as interviews or ethnographic studies, could provide richer insights into the motivations and experiences of players.

Beyond addressing these limitations, there are several avenues for future research that could further deepen our understanding of player engagement in digital gaming environments. One potential direction is exploring additional factors that interact with satisfaction and engagement, such as cultural influences, demographic characteristics, or technological advancements. Cultural background may play a role in shaping player preferences and engagement behaviors, as gaming experiences are often embedded within broader societal and cultural contexts. For instance, players from collectivist cultures may place greater emphasis on social interaction within games, whereas players from individualist cultures may prioritize personal achievement and competition. Understanding these cultural variations can help game developers tailor their products to better suit diverse player bases.

Moreover, technological developments, such as artificial intelligence (AI) and virtual reality (VR), are rapidly transforming the gaming landscape. Future studies could investigate how these emerging technologies influence engagement by offering more immersive and interactive experiences. AI-driven personalization, for example, has the potential to enhance player satisfaction by dynamically adjusting content to match individual preferences and skill levels. Similarly, VR technology can deepen engagement by providing a heightened sense of presence and interactivity within game worlds. As these technologies continue to evolve, research should explore their impact on player behavior, engagement, and well-being.

Finally, an important area of inquiry lies in examining the long-term effects of engagement on players' psychological and financial well-being. While engagement is generally viewed as a positive outcome for both players and developers, excessive gaming or compulsive spending on in-game purchases can lead to negative consequences, such as addiction or financial distress [4]. Investigating the factors that contribute to healthy versus problematic gaming engagement could inform the development of responsible game design practices that promote sustainable and balanced play behaviors. By continuously examining these aspects, we can develop a more comprehensive understanding of player

engagement dynamics and their implications for game design and marketing in the rapidly evolving digital landscape.

C. Conclusion

This study explored the drivers of player engagement in Genshin Impact and examined how that engagement shapes various forms of consumption behavior. The analysis revealed that satisfaction through gameplay, personalization, and social interaction significantly enhance engagement. In turn, higher engagement leads not only to in-game purchases but also to broader behaviors such as co-production, community involvement, word-of-mouth promotion, and player recruitment. These findings challenge the narrow view of digital consumption as purely transactional and instead highlight its social, participatory, and community-driven nature.

The implications are both practical and ethical. For game developers and marketers, the results underscore the value of crafting personalized and satisfying experiences that keep players emotionally and socially invested. Encouraging social interaction within the game environment can also support vibrant communities that extend the game's reach organically. At the same time, as engagement fuels monetization, developers must act responsibly—ensuring transparency, avoiding exploitative mechanics, and protecting players from excessive or compulsive spending, particularly in games targeting younger audiences.

Despite its contributions, this study has several limitations. The exclusive focus on a single title—Genshin Impact—limits generalizability across other game types and player demographics. Self-reported survey data may also be subject to response bias. Additionally, because the study centers on Indonesian Generation Z players, its findings may not fully reflect patterns in different cultural or age groups.

Future research should broaden its scope by including multiple games across genres, integrating behavioral or longitudinal data, and exploring how emerging technologies such as AI-driven personalization or virtual reality reshape engagement patterns. Studies could also examine cross-cultural differences in gaming motivations and behaviors to develop more inclusive and adaptive engagement strategies.

Finally, while the gacha game market has significant potential among Generation Z in Indonesia, it is crucial to prioritize ethical and social considerations in game development to prevent players from falling into addictive behaviors. Developers should implement consumer protection measures and leverage games as an educational tool to raise social and cultural awareness among players.

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APPENDIX

Variables	Items		
	Operationalizations	Code	Sources
<i>Satisfaction Through Game</i>	I feel satisfied when I play this game	STG1	Jasrotia et al. (2022) [6]
	I feel satisfied with my decision playing this game	STG2	
	I feel this game is pretty good	STG3	
	Playing the game makes me feel very delighted	STG4	Akin (2023) [12]
	Playing the game gives me a sense of enjoyment	STG5	
<i>Game Personalization</i>	This game allows me to select characters according to my taste	GP1	Jasrotia et al. (2022) [6]
	The game allows me to adjust the settings of the game as per my taste	GP2	
	The game allows me to select the sounds according to my preferences	GP3	
	[My online game] offers me products and services that I could not find in another game	GP4	Liao (2011) [19]
	[My online game] offers me products and services that satisfy my specific needs	GP5	
<i>Game Social Interaction</i>	I have an excellent interaction with the members of my game	GSI1	Jasrotia et al. (2022) [6]
	I feel I am very close to my game group members	GSI2	
	I feel I mostly hold lengthy discussions with my game group members	GSI3	
	I often participate in activities relating to [gaming brand]	GSI4	Abbasi et al (2023)
	I enjoy playing [gaming brand] with like-minded other gamers	GSI5	
<i>Player Engagement</i>	I play this game for quite long durations as I like this game.	PE1	Jasrotia et al. (2022)
	Time flies when I am playing this game	PE2	
	I like this game in its current form.	PE3	
	I found this game to be of meaning and purpose	PE4	
	I feel I am totally dedicated towards this game.	PE5	
<i>In-game Purchase Intention</i>	I intend to purchase [gaming brand]-associated items	IGPI1	Abbasi et al. (2023)
	My willingness to buy [gaming brand]-associated items is high	IGPI2	
	The likelihood of me purchasing [gaming brand]-associated items is high	IGPI3	
	I strongly recommend others to purchase this mobile game in-game apps.	IGPI4	Akin (2023) [12]
	I plan to spend more on purchasing this mobile game in-game apps.	IGPI5	

Variables	Items		
	Operationalizations	Code	Sources
<i>Community engagement</i>	Exchanging opinions with members of [e-sport gaming brand]-related communities is important to me	CE1	Abbasi et al. (2023)
	I am an actively participating member of [gaming brand]-related communities	CE2	
	I provide feedback online related to participation in the community's activities	CE3	Al-Khasawneh et al (2023)
	I spend a lot of time online in participating with brand community's activities	CE4	
<i>Co-production</i>	I enjoy offering new ideas for [gaming brand]-related products, services and tournaments	CP1	Abbasi et al. (2023)
	I like offering my opinion on [gaming brand]-related development	CP2	
	I enjoy participating in research to develop or improve [gaming brand]-related products or services	CP3	
	I like providing my opinion on issues related to the improvement of [gaming brand]-related products	CP4	
<i>Word-of-mouth</i>	I share information about [gaming brand] with other people	WOM 1	Abbasi et al. (2023)
	I enjoy providing information on [gaming brand] to others	WOM 2	
	I share positive information about this game with other people.	WOM 3	Askoy (2023)
	I like to provide positive information on this game to other people.	WOM 4	
	I say positive things about this game to other people.	WOM 5	
<i>Recruitment</i>	I have invited my family or friends to play [gaming title]	RC1	Abbasi et al. (2023)
	I try to get people to play [gaming title] for the first time	RC2	
	I invite people to try [gaming title]	RC3	
	I recommend this game app to my friends and acquaintances when they ask me	RC4	Vega et al (2023) [21]
	Several of my friends take part in the game because I recommended it	RC5	