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MANAGEMENT

Drivers of Mobile Game Addiction and Its Impact on Game Loyalty and In-App Purchase Intention Among Gen-Z in Indonesia

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ABSTRACT

Purpose: This study aims to analyze the influence of flow experience, escapism, and playfulness on mobile game addiction, and to examine how mobile game addiction affects game loyalty and in-app purchase intention among Generation Z in Indonesia.

Method: A quantitative research design was employed. Data were collected through an online questionnaire distributed to 210 respondents. The data were analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS) with SmartPLS 4 software.

Result: The results show that flow experience and escapism significantly and positively influence game addiction. In contrast, playfulness has a significant negative effect, suggesting that enjoyment alone does not necessarily lead to addictive behavior. Game addiction positively influences both game Loyalty and in-app purchase intention. However, game loyalty does not have a significant effect on in-app purchase intention.

Practical Implications for Economic Growth and Development: These findings offer valuable insights for mobile game developers seeking to enhance user engagement and revenue. By leveraging flow experience and escapism, developers can increase both addiction tendencies and in-app spending. This approach contributes to the growth of Indonesia's digital economy through strategic monetization.

Originality/Value: This study adds to the limited body of research examining psychological drivers of game addiction and their economic implications within the context of Generation Z in a developing digital market.

Keywords: *Game Addiction, Game Loyalty, In-App Purchase Intention, Generation Z, Mobile Legends*

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INTRODUCTION

The phenomenon of internet usage has become an integral part of modern human life. According to the Indonesian Internet Service Providers Association (APJII), the number of internet users in Indonesia is projected to reach 221 million by 2024, equivalent to 79.5% of the total population. The development of digital technology has fueled the growth of the entertainment industry, including online games (Iradat, 2024). One of the most popular mobile games among players today is *Mobile Legends: Bang-Bang*, a Multiplayer Online Battle Arena (MOBA) game developed by Moonton, a Chinese gaming company (Dewi, 2024). According to the State of Mobile 2024 Report released by Data.AI, consumer spending on mobile games in Indonesia reached US$0.41 billion, or the equivalent of Rp6.3 trillion, throughout 2023. This figure represents an increase of US$0.04 billion from the previous year, with *Mobile Legends* becoming the mobile game with the largest user spending in Indonesia, surpassing other

games as of 2024 (CNBC Indonesia, 2024). An APJII survey in 2023 showed that 23.29% of 8,510 respondents had played online games, with 42.23% spending more than 4 hours per day playing (Nabilah, 2023). The phenomenon of gaming addiction is becoming a serious concern. Gaming addiction, known as Gaming Disorder according to the International Classification of Diseases (ICD-11), is characterized by a loss of control over gaming behavior and excessive prioritization of gaming over other activities (World Health Organization, 2020).

One of the factors contributing to gaming addiction is the flow experience, a state of highly focused concentration in which the player is fully absorbed in the playing activity (Csikszentmihalyi, 2000). The greater the Flow Experience a person experiences, the higher the risk of addiction (Kiatsakared & Chen, 2022; Park & Hwang, 2009). Additionally, escape from reality and the search for pleasure are also factors that trigger gaming addiction (Widodo & Balqiah, 2020; Xu et al., 2012). Adolescents are considered more susceptible to gaming addiction, with detection rates reaching 40% among university students (Zhou & Xing, 2021). This addiction not only impacts mental health, such as causing social anxiety and depression (Wang et al., 2019), but also affects in-game consumption behavior. Interestingly, loyalty to games and the tendency to make in-app purchases are related to addiction. Research shows that online mobile game loyalty increases users' intentions to make in-game purchases (Balakrishnan & Griffiths, 2018). This can be seen as a factor in the satisfaction and enjoyment that players feel. On the other hand, it can also indicate potentially harmful, uncontrollable compulsive behavior (Costes & Bonnaire, 2022; Oka et al., 2024).

The novelty of this study, compared to previous research, lies in its integration of the factors of flow experience, escapism, and playfulness into one comprehensive research model, which is rarely analyzed simultaneously in the context of mobile game addiction. It also examines the complex relationship between game addiction, loyalty, and in-app purchase behavior, bridging psychological aspects with business implications. Furthermore, this study offers a deeper understanding of how emotional experiences (playfulness) and motivations (escapism) simultaneously influence player behavior. Previous research has not explored the paradox between the negative impact of addiction on players and the economic benefits accruing to developers, resulting in a lack of attention to the ethical considerations and balance of interests. Building on the preceding discussion, this study examines the influence of flow experience, escapism, and playfulness on mobile game addiction among Indonesian players, exploring the relationship between game addiction and player loyalty, as well as the impact of these factors on in-app purchase intentions.

Hypotheses Development

Flow Experience and Game Addiction

Flow experience is a state of deep concentration in which an individual becomes fully immersed in an activity. It is a common experience, characterized by a sense of empowerment, heightened alertness, effortless control, lack of self-awareness, and operating at the peak of one's abilities (Csikszentmihalyi, 2000). Flow experience is one of the fundamental theories in studying human experiences, and it can also be applied to research on how such experiences may lead to game addiction (Kiatsakared & Chen, 2022; Li & Hui, 2023). Flow experience can be considered a key factor in online gaming addiction, as stronger flow experiences increase the likelihood of gamers developing addictive behaviors (Kiatsakared & Chen, 2022; Park & Hwang, 2009). However, flow experiences are not always positive, as they can also lead to addictive behaviors (e.g., gambling, video games) (Keller & Bless, 2008). Flow experiences that involve emotional states, including perceptual distortions and enjoyment, have a much stronger impact on addiction. This suggests that gamers who experience flow are more likely to become addicted (Chou & Ting, 2003). Another study found that players of Massively Multiplayer Online Role-Playing Games (MMORPGs) who are more skilled are more likely to be immersed in the flow experience and to develop game addiction compared to inexperienced players (Wu et al., 2013). While Flow experience theory shows a positive relationship with addiction in MMO genre games, other studies have reported a

weaker relationship (Li & Hui, 2023). Based on these findings, this study proposes the following hypothesis (H1):

H1: Flow experience has a positive and significant effect on game addiction.

Escapism and Game Addiction

Escapism, or the desire to escape the psychological stresses of real life, plays a crucial role in online gaming addiction. The Uses and Gratifications approach explains that media use is driven by specific goals and sought-after gratifications (Quan-Haase & Young, 2010). In the context of online gaming, escapism is manifested through the use of virtual worlds as a means of avoiding real-world problems (Yee, 2006). Engagement in digital activities as a form of escapism has been shown to increase internet dependence (Ohno, 2016), especially during the pandemic, when the need to relieve stress increased, encouraging players to use games as a means of escape (Prinsen & Schofield, 2021). Furthermore, escapism is not only a motivation for playing but is also included in the diagnostic criteria for internet gaming disorder (Wang et al., 2022), with triggers such as functional needs (Xu et al., 2012) and life changes like parental divorce or starting a new school (Carmona & Whiting, 2021). Players who engage in gaming to escape tend to view the game as real and spend more time playing (Kaczmarek & Drązkowski, 2014). Previous research confirms that this element of escape significantly contributes to the development of online gaming addiction (Xu et al., 2012; Xu & Yuan, 2008). Therefore, we propose the following second hypothesis (H2):

H2: Escapism has a positive and significant effect on game addiction.

Playfulness and Game Addiction

Playfulness refers to the tendency of individuals to engage in activities for the sake of enjoyment, characterized by enthusiastic, spontaneous, and interactive attitudes (Vleet & Feeney, 2015). This concept aligns with the Uses and Gratifications approach, which asserts that individuals actively use media to fulfill their social and psychological needs (Blumler, 1979). In this context, playfulness reflects the ability to view situations in a playful and flexible manner and serves as an adaptive mechanism in response to social and psychological pressures (Barnett, 2007). Beyond being merely an element of entertainment, playfulness also plays a crucial role in increasing individuals' interest and intention to use a service, including technology-based services such as mobile games (Sledgianowski & Kulviwat, 2009). In mobile gaming environments, the enjoyment experienced while playing or interacting with other players is the main attraction (Hsiao & Chen, 2016), with most players motivated by the sense of fun, the thrill of victory, and the convenience of playing anytime and anywhere (Chen & Leung, 2016). Individuals with high levels of playfulness tend to be more open to new experiences, more easily immersed in the game, and more likely to lose track of time while playing (Bhatiasevi et al., 2023; Kiverstein & Miller, 2023). Furthermore, the emotional pleasure derived from playing encourages players to recommend the game to others (Hsiao & Chen, 2016). Research has also shown a positive relationship between playfulness and mobile game addiction, making playfulness an important aspect in understanding the psychological dynamics of gaming (Vleet & Feeney, 2015; Widodo & Balqiah, 2020). Based on these findings, the following hypothesis is proposed:

H3: Playfulness has a positive and significant effect on game addiction.

Game Addiction and Game Loyalty

Various studies have revealed a significant relationship between online game addiction and player loyalty. Online game addiction is a behavior that can be measured based on the extent to which a person is psychologically or emotionally dependent on the game (Choi et al., 2018). Lu and Wang (2008) found that online game addiction directly contributed to loyalty in playing

online games. This finding is supported by the research of Ronaldo et al. (2024), which identified a significant positive impact of mobile game addiction on game loyalty. Balakrishnan and Griffiths (2018) also confirmed the positive relationship between online game addiction and gaming loyalty in their study. Brunborg et al. (2015) and Charlton and Danforth (2007) developed a model of gaming addiction that distinguishes between peripheral criteria (salience, mood modification, tolerance), which reflect high engagement without necessarily being addictive, and core criteria (withdrawal symptoms, conflict, relapse, problems), which are the main components of addiction. The high engagement reflected in these peripheral criteria often contributes to the formation of player loyalty to the games played, suggesting that strong psychological attachment is a driving factor in the formation of player loyalty. In this context, loyalty to the game is seen as an underlying motivation for player behavior. Therefore, this research proposes that addiction to online mobile games can lead to the formation of player loyalty to the game. Based on this reasoning, the following hypothesis is proposed:

H4: Game addiction has a positive effect and significant influence on game loyalty.

Game Addiction and In-App Purchase Intention

Online game addiction has also been shown to impact in-app purchase intention. However, empirical evidence on the relationship between online game addiction and purchase intention remains limited. Purchase intention is a complex behavior that involves both individual abilities and motivations (Balakrishnan & Griffiths, 2018). Gaming addiction is associated with an increased intention to make in-app purchases, as addicted players are often compelled to buy digital items, such as costumes or additional features, to improve performance or enhance the appearance of in-game characters (Ronaldo et al., 2024). Furthermore, high play duration and the perception of unconscious playtime also increase the propensity to make purchases (Oka et al., 2024). In fact, in-game spending is linked to gaming disorder, classified as Internet Gaming Disorder (Costes & Bonnaire, 2022). Based on these findings, this study proposes the following hypothesis (H5):

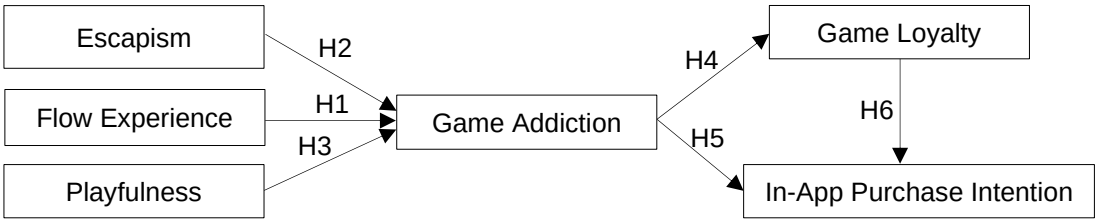
H5: Game addiction has a positive and significant effect on purchase intention in the app.

Game Loyalty and In-App Purchase Intention

Loyalty to online games has been shown to have a significant and direct influence on players' intention to make in-app purchases. Hsiao and Chen (2016) found that loyalty, along with perceived affordability, are important factors driving purchase intentions. In addition, players' perceptions of elements such as playfulness, social connectivity, ease of access, and reward systems also strengthen loyalty, although the impact on purchase intention tends to be lower among non-paying players. Widodo and Balqiah (2020) conducted research in the context of battle royale mobile games, showing the influence of player loyalty on their decision to purchase additional features in the application. Support for this finding is also provided by Balakrishnan and Griffiths (2018) and Ronaldo et al. (2024), who both assert that loyalty to games is a crucial driver of in-game purchase intentions. Based on these findings, it can be assumed that players with high loyalty towards a game are more likely to be motivated to make in-app purchases to enhance their gaming experience. Thus, the following hypothesis is proposed:

H6: Game loyalty has a positive and significant effect on purchase intention in the app.

Figure 1. Conceptual Framework



Source: Developed by the authors (2025)

METHOD

The analysis in this research was conducted using a quantitative method, employing descriptive statistics and hypothesis testing with SmartPLS 4. The variables involved in this study include escapism, flow experience, playfulness, game addiction, game loyalty, in-app purchase intention, and game loyalty.

In this study, the target population is Indonesia's Generation Z. A purposive sampling technique was used for sampling. Purposive sampling is a nonprobability sampling technique employed by researchers to select a sample from a population based on specific criteria. This technique is particularly relevant when randomization is not feasible, such as in very large populations. Additionally, purposive sampling is useful when researchers face constraints related to resources, time, and labor (Etikan, 2016). The criteria established by the authors for this research are Generation Z individuals on two major Indonesian islands: Java and Sumatra. The distribution of Mobile Legends players is predominantly on Java Island (52.65%) and Sumatra Island (29.38%) (Pratnyawan & Rachmanta, 2021). For each island, three provinces with the largest Gen-Z populations were selected based on data from the Central Statistics Agency in 2020: West Java, East Java, and Central Java for Java, and North Sumatra, South Sumatra, and Lampung for Sumatra (Badan Pusat Statistik, 2020). The sample size was determined using the formula outlined by Hair et al. (2021), which suggests that the minimum sample size must be 10 times the maximum number of arrows pointing to the latent variable in the PLS path model. Therefore, the minimum number of respondents in this sample is 210.

This research employs statistical SEM-PLS analysis, conducted using SmartPLS 4 software. Structural equation modeling (SEM) enables researchers to simultaneously model and estimate complex relationships between multiple dependent and independent variables. SEM also accounts for measurement errors in observed variables when analyzing these relationships (Hair et al., 2021). The PLS path model consists of two key components: the first is the structural model (inner model), which represents the relationships between latent constructs; the second is the measurement model (outer model), which defines the connections between latent constructs and their indicators. By integrating these two elements, the analysis can assess causal relationships while ensuring the validity and reliability of each indicator (Hair et al., 2021).

Table 1. Operational Variables

Variables	Codes	Statements
Flow Experience (Kiatsakared & Chen, 2022)	FE1	I really enjoy the pleasure of playing Mobile Legends.
	FE2	I am easily distracted while playing Mobile Legends.
	FE3	When I play Mobile Legends, I get curious.
	FE4	I feel comfortable with Mobile Legends.

Variables	Codes	Statements
	FE5	When I'm playing Mobile Legends, I give my full attention.
Escapism (Xu et al., 2012)	ESC1	I usually play games to avoid thinking about some real-life problems or worries.
	ESC2	I usually play games to relax from the day's work or study stress.
	ESC3	I often use gaming to escape from real-world problems.
	ESC4	I often use gaming to alleviate my depression.
Playfulness (Hsiao & Chen, 2016)	PF1	I think playing Mobile Legends is interesting.
	PF2	I think playing Mobile Legends is enjoyable.
	PF3	I think playing Mobile Legends is exciting.
	PF4	I think playing Mobile Legends is fun.
Game Addiction (Balakrishnan & Griffiths, 2018)	SA1	I play Mobile Legends all day long.
	SA2	I spend a lot of free time playing Mobile Legends.
	SA3	I feel addicted to Mobile Legends.
	TOL1	I play Mobile Legends longer than intended.
	TOL2	I spend increasing amounts of time playing Mobile Legends.
	TOL3	I can't stop once I start playing Mobile Legends.
	MM1	I play Mobile Legends to forget about real life.
	MM2	I play Mobile Legends to release stress.
	MM3	I play Mobile Legends to feel better.
	REL1	I can't reduce the time I spend playing Mobile Legends.
	REL2	Nothing else has successfully reduced the time I spend playing Mobile Legends.
	REL3	I fail when trying to reduce the amount of time spent playing Mobile Legends.
	WD1	I feel bad when I'm unable to play Mobile Legends.
	WD2	I become angry when I'm unable to play Mobile Legends.
	WD3	I become stressed when I'm unable to play Mobile Legends.
	CF1	I fight with other people (e.g., family, friends) while I play Mobile Legends.
	CF2	I neglect others (e.g., family, friends) because I'm playing Mobile Legends.
	CF3	I lie about the time spent playing Mobile Legends.
	PRB1	Playing Mobile Legends causes sleep deprivation.
	PRB2	I neglect other important activities (e.g., school, work, sports) to play Mobile Legends.
	PRB3	I feel bad after playing Mobile Legends for a long time.
Game Loyalty (Balakrishnan & Griffiths, 2018)	GL1	Overall, Mobile Legends is satisfactory enough to reuse later.
	GL2	I would reuse Mobile Legends when I want to play online games.
In-app Purchase Intention (Balakrishnan & Griffiths, 2018)	PI1	I intend to continue purchasing Mobile Legends in-game apps.
	PI2	I strongly recommend others purchase Mobile Legends in-game apps.

Variables	Codes	Statements
	PI3	I find purchasing Mobile Legends in-game apps to be worthwhile.
	PI4	I am likely to frequently purchase Mobile Legends in-game apps in the future.
	PI5	I plan to spend more on purchasing Mobile Legends in-game apps.

Source: Compiled by the authors (2025)

RESULT AND DISCUSSION

Demographics of Respondents

This research utilizes a questionnaire created using Google Forms and distributed through various social media platforms such as Instagram, Facebook, and X (Twitter), with a target sample of 210 respondents. The majority of respondents in this study were male (77.6%), with the dominant age group between 20 and 23 years old (92%). In terms of education, most respondents have a high school/vocational school education (56.2%), followed by bachelor's degree graduates (42.4%), while diploma graduates make up only 1.4%. In terms of income, the majority of respondents earned between IDR 2,500,000 and IDR 3,000,000 (35.7%), followed by groups with income less than IDR 2,500,000 (28.6%) and those earning IDR 3,000,000 to IDR 5,000,000 (28.6%), while only 7.1% had an income above IDR 5,000,000.

Respondents came from two major islands in Indonesia, covering six provinces with the largest Generation Z population in the country, with the majority coming from West Java (27.2%), followed by South Sumatra (23.8%) and Lampung (19.5%). In terms of gaming habits, the majority of respondents play frequently, with 48.1% playing 4-6 times a week and 11.4% playing more than 6 times a week. The duration of play is also significant, with 48.6% playing for 3-4 hours per session and 22.4% playing for 1-2 hours.

Regarding spending on gaming, most respondents (58.5%) allocate IDR 100,000 - IDR 500,000 per month, while 22.9% do not spend any money at all. Only 5.3% of respondents spend more than IDR 500,000 per month on gaming. Overall, this data shows that the majority of respondents are young adult males with relatively restrained spending levels on gaming activities, but with high frequency and duration of gameplay.

Validity and Reliability Tests

According to Hair et al. (2019), a loading value above 0.7 is recommended, as it indicates that the construct explains more than 50% of the indicator's variance, ensuring sufficient item reliability. Generally, higher loading values indicate greater reliability. Reliability scores between 0.60 and 0.70 are considered acceptable, while values ranging from 0.70 to 0.90 indicate satisfactory to good reliability. Consequently, values below 0.60 are excluded.

Table 2. Validity and Reliability

Variables	Items	Outer Loadings	Composite Reliability	AVE	Conclusion
Escapism	ESC1	0.831	0.872	0.634	Valid
	ESC3	0.840			Valid
	ESC4	0.864			Valid
Flow Experience	FE2	0.754	0.826	0.542	Valid
	FE4	0.746			Valid
	FE5	0.735			Valid
Playfulness	PF1	0.845	0.981	0.711	Valid
	PF2	0.822			Valid

Variables	Items	Outer Loadings	Composite Reliability	AVE	Conclusion
	PF3	0.776			Valid
	PF4	0.826			Valid
Game Addiction	SA1	0.824	0.892	0.805	Valid
	SA2	0.838			Valid
	SA3	0.813			Valid
	TOL1	0.844			Valid
	TOL2	0.887			Valid
	TOL3	0.855			Valid
	MM1	0.852			Valid
	MM2	0.760			Valid
	MM3	0.742			Valid
	REL1	0.862			Valid
	REL2	0.906			Valid
	REL3	0.896			Valid
	WD1	0.872			Valid
	WD2	0.880			Valid
	WD3	0.909			Valid
	CF1	0.845			Valid
	CF2	0.859			Valid
	CF3	0.864			Valid
	PRB1	0.800			Valid
	PRB2	0.876			Valid
Game Loyalty	GL1	0.906	0.890	0.669	Valid
	GL2	0.889			Valid
In-App Purchase Intention	PI1	0.917	0.953	0.803	Valid
	PI2	0.864			Valid
	PI3	0.881			Valid
	PI4	0.920			Valid
	PI5	0.896			Valid

Source: Processed data (2025)

Based on the results of the reliability analysis and construct validity, all variables demonstrate a good level of reliability. Escapism has a Cronbach's Alpha value of 0.805 and a Composite Reliability (CR) of 0.872, indicating strong reliability, with an Average Variance Extracted (AVE) of 0.634, which meets the minimum threshold of 0.50 for convergent validity. Flow Experience exhibited fairly good reliability with a Cronbach's Alpha of 0.724 and a CR of 0.826, although its AVE value of 0.542 still falls within reasonable limits for convergent validity. Game Addiction showed very high reliability with a Cronbach's Alpha of 0.979, CR of 0.981, and an AVE of 0.711, indicating very strong internal consistency. Game Loyalty also displayed good reliability with a Cronbach's Alpha of 0.758 and a CR of 0.892, as well as an AVE value of 0.805, indicating that this variable has very strong convergent validity. Playfulness demonstrated high reliability with a Cronbach's Alpha of 0.835 and a CR of 0.890, along with an AVE of 0.669, confirming that this variable is both valid and reliable. In-App Purchase Intention recorded very high reliability values, with a Cronbach's Alpha of 0.938 and a CR of 0.953, while an AVE of 0.803 indicated that this construct has an excellent ability to explain the variance of its indicators. Overall, all variables show good reliability (CR > 0.7) and adequate convergent validity (AVE > 0.5), making them suitable for further analyses.

R-Squared Test

R-square measures the explanatory power of a model but does not reflect its predictive ability beyond the sample. It ranges from 0 to 1, with higher values indicating stronger explanatory power. Generally, R-square values of 0.75, 0.50, and 0.25 are considered strong, moderate, and weak, respectively (Hair et al., 2021).

Based on the results, the R-square analysis indicates that the model demonstrates strong predictive ability for both Game Addiction and In-app Purchase Intention, with R-square values of 0.677 and 0.756, respectively. This suggests that Flow Experience, Escapism, and Playfulness collectively explain approximately 67.7% of the variance in Game Addiction, while Game Addiction and Game Loyalty account for 75.6% of the variance in In-app Purchase Intention. The Adjusted R-square values for these two variables are only slightly lower, indicating that the model remains accurate in predicting the relationships between variables, and that the predictor variables used are sufficiently relevant. In contrast, Game Loyalty has a lower R-square value of 0.331, indicating that only 33.1% of the variation in player loyalty can be explained by Game Addiction, suggesting that other factors outside the model may exert a stronger influence on player loyalty. Overall, Game Addiction emerges as the key factor in the model, as it not only has a high R-square but also exerts a significant influence on both Game Loyalty and In-app Purchase Intention.

Table 3. R-Squared Test

Variables	R-Square	R-Square Adjusted
Game Addiction	0.677	0.672
Game Loyalty	0.331	0.327
In-app Purchase Intention	0.756	0.754

Source: Processed data (2025)

Hypotheses Testing

The analysis of the relationship between Flow Experience and Game Addiction reveals a significant effect, with an original sample value of 0.605 and a p-value of 0.000, which is well below the 0.05 threshold. Consequently, the first hypothesis is supported, indicating that Flow Experience exerts a positive and statistically significant influence on Game Addiction. Similarly, Escapism demonstrates a significant positive effect on Game Addiction, with an original sample value of 0.381 and a p-value of 0.000. Therefore, the second hypothesis is also supported, suggesting that Escapism has a positive and significant influence on Game Addiction. In contrast, the effect of Playfulness on Game Addiction presents an interesting outcome. The original sample value of -0.181, along with a p-value of 0.031, leads to the rejection of the third hypothesis. This finding indicates that Playfulness does not have a positive and significant influence on Game Addiction. The relationship between Game Addiction and Game Loyalty reveals a strong positive association, with an original sample value of 0.575 and a p-value of 0.000. As such, the fourth hypothesis is supported, indicating that Game Addiction positively and significantly influences Game Loyalty. Additionally, the effect of Game Addiction on In-App Purchase Intention shows a highly significant correlation, with an original sample value of 0.878 and a p-value of 0.000. Therefore, the fifth hypothesis is supported, suggesting that Game Addiction has a positive and significant influence on In-App Purchase Intention. In contrast to prior findings, the effect of Game Loyalty on In-App Purchase Intention does not reach statistical significance. With an original sample value of -0.016 and a p-value of 0.352, the sixth hypothesis is rejected, indicating that Game Loyalty does not significantly influence In-App Purchase Intention in this context.

Table 4. Hypotheses Testing Result

Direction	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Conclusion
ESC → GA	0.381	0.382	0.089	4.272	0.000	Supported
FE → GA	0.605	0.606	0.094	6.448	0.000	Supported
PF → GA	-0.181	-0.175	0.097	1.862	0.031	Not Supported
GA → GL	0.575	0.575	0.061	9.402	0.000	Supported
GA → PI	0.878	0.880	0.035	25.165	0.000	Supported
GL → PI	-0.016	-0.017	0.042	0.381	0.352	Not Supported

Source: Processed data (2025)

Discussion

The results of hypothesis testing show that H1 in this study is accepted. This finding indicates that flow experience acts as a crucial factor in shaping addictive behavior patterns in gaming. Flow experience creates a feeling of immersion, deep focus, and enjoyment while playing, which makes it difficult for players to stop. When players experience this state repeatedly, the urge to continue playing becomes stronger, potentially developing into a habit that is difficult to control. In *Mobile Legends*, elements such as real-time competitive play, ranking systems, and constant rewards reinforce players' emotional and cognitive engagement, increasing the likelihood of addictive behavior. This is consistent with previous findings showing that flow experiences can increase players' deep engagement until they lose their perception of time and control, ultimately leading to game addiction (Chou & Ting, 2003; Kiatsakared & Chen, 2022; Park & Hwang, 2009).

Escapism also has a significant positive effect on game addiction. The results of hypothesis testing show that H2 in this study is accepted. This result aligns with previous studies, which show that escapism, as a form of escape from the pressures of real life, is one of the main factors that encourage individuals to continue playing until they experience addiction (Xu et al., 2012; Yee, 2006). When players use *Mobile Legends* as a way to escape from real-world problems, they tend to become increasingly immersed in a virtual world that offers instant gratification and achievements difficult to obtain in everyday life. Game mechanics in *Mobile Legends*, such as the thrill of control, achievement, and alternate identities, provide a temporary sense of relief from the pressures of life. This creates a highly attractive environment for players who want to avoid stress, boredom, or other negative emotions. As a result, players spend more time playing, both in terms of duration and frequency. Escapism does have a real and direct impact on increasing gaming addiction, making it a significant risk factor that needs to be considered in understanding addictive behavior toward mobile games like *Mobile Legends*.

However, an interesting finding emerged in the Playfulness variable, which showed a negative influence on game addiction. The hypothesis test results indicated that H3 was rejected. This finding suggests that when an individual views *Mobile Legends* as a form of casual entertainment—neither an escape from life's problems nor serious competition—they are more likely to manage their playing time and stop when the game is no longer fun. This playful attitude makes players focus more on the spontaneous and exploratory aspects of fun, rather than on achievements in the reward system or in-game hierarchies. This allows them to move on to other activities without feeling lost or left behind in the game's progression. In the context of *Mobile Legends*, which is known for its competitive systems such as rank, MVP, and exclusive skins, players with a playful attitude do not get caught up in these pressures. They enjoy the game as a fun, momentary experience rather than a recurring compulsion, minimizing the potential for addiction. This finding is also in line with Vleet & Feeney (2015), which states that individuals with playfulness tend to play games casually, with enthusiasm and healthy interactivity, without a compulsive urge to keep playing.

The results of hypothesis testing show that H4 in this study is accepted, confirming the existence of a positive and significant relationship between game addiction and game loyalty in the context of *Mobile Legends*. That is, the higher the level of players' addiction to this game, the greater their loyalty to it. This is consistent with research showing that addicted individuals tend to have a high emotional attachment to games and continue to play in the long term (Balakrishnan & Griffiths, 2018; Lu & Wang, 2008). These findings suggest that when players develop an addiction to *Mobile Legends*, they also form strong psychological and emotional bonds with the game, resulting in an unwillingness to switch to other games, even if similar alternatives are available. Players who experience addiction tend to spend more time playing, accompanied by feelings of satisfaction and a strong urge to continue using the app on a recurring basis. All these behaviors are indicators of loyalty to the game. The deeper the addiction, the greater the player's commitment to keep playing in the long term, even recommending it to others. This reinforces the clear causal relationship between game addiction and loyalty to the game.

The results of hypothesis testing show that H5 in this study is accepted, meaning that game addiction has a positive and significant influence on in-app purchase intention in *Mobile Legends*. Players who experience addiction tend to consider in-app purchases as an important form of investment to maximize their gaming experience. This finding is consistent with previous research, which also shows that game addiction is positively correlated with in-app purchase intention, where addicted players are more compelled to make purchases to enhance their gaming experience (Costes & Bonnaire, 2022; Oka et al., 2024). They are willing to buy exclusive skins to increase their social status in the community, unlock new heroes to expand their game strategy, or access premium in-game features. This deep emotional involvement means that addicted players tend to ignore financial considerations that are usually prohibitive for casual players. Instead, they are more willing to spend real money for the satisfaction gained from the virtual world. In addition, the reward system in *Mobile Legends* that offers competitive advantages, as well as visually appealing displays through in-app purchases, becomes very tempting for addicted players, as they continue to pursue feelings of achievement and excellence through premium items.

The final hypothesis, stating that game loyalty influences in-app purchase intention, was rejected. This finding reveals that players' high loyalty to the game does not necessarily encourage them to make in-app purchases. In the context of *Mobile Legends*, this result shows the complexity of digital consumer behavior, especially among Gen Z Indonesians. Loyal players may feel that the free-to-play experience is satisfying enough not to feel the urgency to make additional purchases. Economic factors and perceived value also play an important role, where loyal players tend to be more critical in evaluating whether in-app purchases are truly worth the price, compared to more impulsive casual players. These findings are consistent with previous research, which suggests that other factors, such as price, rewards, bonus offers, package deals, or other external factors, may play a greater role in determining players' purchase intentions (Cheung et al., 2023; Hsiao & Chen, 2016).

CONCLUSION

This study aimed to investigate the influence of flow experience, escapism, and playfulness on game addiction, and to further explore how game addiction impacts game loyalty and in-app purchase intention among Generation Z mobile game players in Indonesia.

The findings revealed that flow experience and escapism significantly and positively affect game addiction, while playfulness showed a negative effect. Furthermore, game addiction was found to significantly influence both game loyalty and in-app purchase intention. Interestingly, game loyalty did not have a significant effect on in-app purchase intention, highlighting that emotional attachment does not always translate into financial transactions within the game.

This study provides important insights for game developers and digital marketers. To increase user engagement and revenue, developers can enhance immersive features and escapist

elements within games to build strong user involvement. However, caution is advised, as these strategies can increase the risk of addiction. Ethical monetization strategies should be implemented to balance profit motives with player well-being. Policymakers can also use these findings to regulate in-app purchases and promote digital literacy among youth, especially in managing screen time and spending behavior.

Future research could expand beyond Java and Sumatra to encompass a more diverse demographic across Indonesia or include different age groups for broader generalizability. It is also recommended to study other game genres to determine whether the findings hold true in different gaming contexts. Additionally, using longitudinal methods or qualitative approaches can provide a more comprehensive understanding of the psychological and behavioral dynamics of gaming addiction over time. Exploring mediating variables such as mental health, social environment, or financial literacy would also enhance future studies.

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