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Original Research Article

The Impact of Gaming Addiction and Gamer Loyalty on Generation Z's Impulse Buying of Virtual Items in Online Games

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Abstract: Research on Generation Z's online gaming habits, particularly in Indonesia, is intriguing. It is due to changes in consumer behavior influenced by technological advancements, which impact Generation Z, who are becoming increasingly active in online games, which can even affect purchasing power. In a broader sense, a demographic bonus controls the growth of the Indonesian population, particularly Generation Z. This study aimed to investigate the direct and indirect impacts of gaming addiction and gamer loyalty on impulse buying. The research data was collected from 250 individuals from Generation Z in Indonesia who were chosen using a purposive sampling technique. In addition, the data were analyzed with SEM AMOS 26 software. The primary finding of this study was that Generation Z's gaming addiction could increase gamer loyalty and impulse buying of virtual items in online games.

Keywords: Online mobile games, gaming addiction, gamer loyalty, impulse buying, structural equation modelling.

1. INTRODUCTION

Online games are electronic game software that serves as a business model for selling in-game items to players, thereby assisting them in achieving their goals and improving their gaming abilities. This enterprise can generate income from three primary sources: paid game downloads (Gainsbury *et al*., 2016), in-game item purchases (Alha *et al*., 2016; Hsiao & Chen, 2016), and in-game advertising (Hofacker *et al*., 2016; Lin, 2014). Online games are initially provided as a freemium service, but if users or players want to access additional features and purchase virtual items, they must pay money (Staykova & Damsgaard, 2015; Liu *et al*., 2015). In online games, people can purchase coins, lives, costumes, ammunition, etc. (Cleghorn & Griffiths, 2015; Hsu & Lin, 2016).

People worldwide enjoy playing online games, including Generation Z in Indonesia (Rakuten Insight, 2022), a cohort of individuals born between 1995 and 2010 (Oblinger & Oblinger, 2005; Kane, 2010). One of the behaviors rapidly evolving in Generation Z is frequent impulse buying (Purmono & Ramadhania, 2021). Indonesia experienced a demographic bonus: the 68 million members of Generation Z in 2010 were nearly double the size of Generation X, born between 1965 and 1980 (Indonesian Central Bureau of Statistics, 2015). Indonesia contributed IDR 30 trillion to expenditures on online games, accounting for 43% of Southeast Asia's total of IDR 69.77 trillion (DANA Internal Research, 2021). Therefore, modern marketers consider market segments of young consumers promising and worthy of consideration (Mangleburg *et al*., 2004).

Technological advancements make it easier for gamers to access games on their smartphones at any time or place. This condition causes an addiction to online gaming. Young (2009) stresses the importance of understanding the origin of the relevant habit in order to comprehend online game addiction. Naturally, players become more emotionally and psychologically invested the longer they play online games (Griffiths, 2010). Nonetheless, why are more people

purchasing virtual goods? In this regard, the functionality and quality of a physical or digital product are viewed as fundamental factors (Lehdonvirta, 2009). An additional distinction between real and virtual for a gamer is the item's effectiveness, in which the difficulty of acquiring it reflects the player's skill, accomplishment, and popularity (Lehdonvirta, Wilska, & Johnson, 2009). In the game *Mobile Legends*, for instance, *skins* range in difficulty from "elite," which is the easiest to obtain, to "legend" and "collector," which are the most difficult. All of them, however, require in-game purchases.

Several previous studies have analyzed numerous determinants of purchases in online games, including value (Keeney, 1999; Hsiao & Chen, 2016; Hsu & Lin, 2016), information (Chemma & Papatla, 2010), price (Weisstein *et al*., 2016), and lifestyle (Swinyard & Smith, 2003). Moreover, psychological research has been conducted regarding online game purchases and impulsive and compulsive actions (Greenfield, 1999; Dittmar *et al*., 2007; Maraz *et al*., 2016). In addition, Lu and Wang (2008) explored the impact of online game addiction on 1,186 gamers, discovering an increase in loyalty and a weakening correlation between satisfaction and loyalty. They argued that these findings explained why dissatisfied gamers remained loyal to online games. Meanwhile, Balakrishnan and Griffiths (2018) discovered that online game addiction and loyalty significantly affected the purchasing intentions of online game features. However, empirical evidence regarding online gaming addiction was mainly stagnant. This study focused on a new dimension: the role of online game addiction and gamer loyalty in Generation Z's impulse buying behavior in Indonesia

2. LITERATURE REVIEW

2.1 Gaming Addiction and Gamer Loyalty

The psychological dependence manifested by excessive online gaming behavior distinguishes gaming addiction from an obsession with nicotine or caffeine. Experiential and appreciative gameplay can cultivate a player's affection for online games, which is then interpreted as an unhealthy addiction (Kandell, 1998; Griffiths, 2000; Balakrishnan & Griffiths, 2018). With the advancement of technology that facilitates access to online games, many individuals are participating in these activities worldwide (Teng, 2017).

Lu and Wang (2008) demonstrated that persistent addiction could increase user loyalty. The role of behavioral addictions and the correlation between social seeking and peer attachment revealed that game loyalty became the primary cause (Blinka & Mikuska, 2014; Kařupová & Blinka, 2016). Additionally, gaming addiction significantly affected player loyalty (Balakrishnan & Griffiths, 2018). The significance of gaming addiction was recognized, leading to the formulation of the following research hypothesis:
H1. Gaming Addiction has a positive and significant impact on Gamer Loyalty.

2.2 Gaming Addiction and Impulse Buying in Generation Z

Impulse buying is the unplanned, non-reflective, and immediate purchase of a product based on an impulse (Wakefield *et al*., 2022). However, this decision can be differentiated based on the primary criterion of whether consumers are motivated to achieve the desired state or avoid the undesirable one (Das, 2015). Some researchers have proposed a connection between addiction and purchase intent or behavior (Wakefield *et al*., 2007; Duroy *et al*., 2014; Andreassen *et al*., 2015; Weinstein *et al*., 2016; Lee *et al*., 2016). Increased purchases for online mobile game features influenced by impulsive and compulsive behaviors might result from online game addiction (Balakrishnan & Griffiths, 2018). Younger generations' online gaming addiction also contributed to peak impulsive purchases (Mubarok, 2021).

Generation Z may make purchases with less forethought than previous generations, given their propensity for greater impulsivity at relatively younger ages (Pechmann *et al*., 2005). In addition, they participate in online gaming in Indonesia (Rakuten Insight, 2022), resulting in instant gratification due to their immature self-control skills. Consequently, impulsive behavior in the younger generation is deemed crucial to investigate, given that Generation Z has a substantial market segment with significant financial potential (Mangleburg *et al*., 2004). Using the preceding description, researchers attempted to formulate the following second hypothesis:
H2. Gaming Addiction has a positive and significant impact on Impulse Buying in Generation Z.

2.3 Gamer Loyalty and Impulse Buying in Generation Z

The definition of gamer loyalty is repeatedly playing the same game within a given time frame and being willing to repurchase if necessary (Liao *et al*., 2020). Loyalty influenced by addiction can increase impulse-buying practices. When studying loyalty, it is necessary to consider the distinctions between attitudes and behaviors. Recommendations are one of the factors that can be used to gauge a customer's attitudinal loyalty. In the meantime, behavioral loyalty can be evaluated using a different metric, such as purchase frequency (Das, 2015). Attitudinal loyalty is the psychological disposition of a consumer toward the same store. In contrast, behavioral loyalty is based on repeated purchases made at the same store (Das, 2015).

The present study defined gamer loyalty as behavioral loyalty to virtual item products in online games. It significantly affects the likelihood of making in-game purchases (Cheung *et al*., 2021). Loyalty influenced by addiction can increase impulse-buying practices. However, empirical studies on the effect of gamer loyalty on the attitudes and habits of playing video games among Generation Z concerning impulsive purchasing were scarce. Thus, previous research suggested investigating impulse buying (Balakrishnan & Griffiths, 2018). Regarding this, researchers proposed the following third and fourth hypotheses:

H3. Gamer Loyalty has a positive and significant impact on Impulse Buying in Generation Z.

H4. Gaming Addiction has an indirect impact on Impulse Buying through Gamer Loyalty in Generation Z.

3. METHODOLOGY

3.1 Measurements

Research data were collected using a questionnaire with a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). The Gaming Addiction variable was measured using 14 items from 7 indicators (salience, tolerance, mood modification, relapse, withdrawal, conflict, and problems) by Balakrishnan & Griffiths (2018). The Gamer Loyalty variable was measured using 3 items from 2 indicators (gaming frequency, gaming history, and intention to play a game repeatedly) by Hong *et al*., (2015), Liao & Teng (2017), and Liao *et al*., (2020). Meanwhile, Impulse Buying was examined using 3 items from 3 indicators (immediate, spontaneous, and dominated by emotions) by Verhagen & Dolen (2011). Demographic information collected by researchers included gender, age, occupation, purchase intensity, and sources of funds to purchase virtual items in online games.

3.2 Sampling and Data Collection

This study involved 250 participants selected using a purposive sampling technique based on the following criteria: respondents were between the ages of 15 and 27 years; they had played online games for at least three months; they had purchased virtual items in online games within the previous three months; they had a role in deciding to purchase virtual items in online games. In addition, online games were selected as the subject of study because more and more Indonesians were gaining access to them.

3.3 Data Analysis

The research data were analyzed using the AMOS 26 and the Structural Equation Modeling (SEM) method. SEM allowed researchers to simultaneously conduct three types of analysis, including testing the model of correlation between variables related to the measurement model, obtaining a model suitable for predictions related to the analysis of the structural model, and determining the validity and reliability of the instrument related to confirmatory factor analysis. The overall fit of the model was measured using Chi-Square ($\chi 2$), Root Mean Squared Residual (RMR), Goodness of Fit Index (GFI), Tucker-Lewis Index (TLI), Incremental Fit Index (IFI), Comparative Fit Index (CFI), and the Normed Fit Index (NFI). Moreover, SEM analysis was conducted to determine whether the research hypothesis was accepted or rejected by displaying the t-scores for each coefficient. The hypothesis was deemed significant if the t-score was greater than the t-table at a significance level of 0.05. In the meantime, the Sobel test determined the indirect impact of the mediating variable.

3.4 Profile of the respondents

Table-1: Respondents' Profile

Category	Item	f	%
Gender	Male	199	79.6
	Female	51	20.4
	Total	250	100
Age	15 – 18 years old	105	42
	19 – 22 years old	81	32
	23 – 27 years old	64	26
	Total	250	100
Occupation	Student	98	39.2
	College Student	75	30
	Employee	32	12.8
	Others	45	18
	Total	250	100
In-game Purchase Intensity in a Month	1 - 2 times	126	50.4
	3 - 4 times	56	22.4
	5 - 6 times	21	8.4
	More than 6 times	47	18.8
	Total	250	100

Category	Item	f	%
Sources of Funds to Purchase Virtual Items in Online Games	Independent work/business	121	48.4
	Parents	114	45.6
	Others	15	6
	Total	250	100

As presented in Table 1, the sample of this study was made up of 250 respondents 79.6% male and 20.4% female of whom 39.2% were student, 30% were college student, 12.8% were employee, 18.8% were others. Of the respondents, 48.4% had independent funds, while 45.6% sources from the parents and 6% the others. The ages of the respondents were between 15 – 18 years old are 42%, 19 – 22 years old are 32% and 23 – 27 years old are 26%. The majority 50.4% of the respondents were had purchase intensity in a month between 1 – 2 times, 22.4% were 3 – 4 times, 18.8% more than 6 times. Only 8.4% reported their purchase intensity was 5 – 6 times.

3.5 Measurement and Structural Models

The results of Goodness of Fit, validity, and reliability tests can be described as follow:

Table-2: Measurement Model Results

Variable	Indicator	Items	Factor Loading	CR	AVE
Gaming Addiction (Balakrishnan & Griffiths, 2018)	Salience	GA1	0.86	0.98	0.71
		GA2	0.86		
	Tolerance	GA3	0.86		
		GA4	0.79		
	Mood Modification	GA5	0.90		
		GA6	0.90		
	Relapse	GA7	0.82		
		GA8	0.81		
	Withdrawal	GA9	0.80		
		GA10	0.78		
	Conflict	GA11	0.82		
		GA12	0.86		
	Problems	GA13	0.91		
		GA14	0.84		
Gamer Loyalty (Hong *et al*., 2015; Liao & Teng, 2017; Liao *et al*., 2020)	Gaming Frequency	GL1	0.94	0.98	0.80
		GL2	0.91		
	Gaming History	GL3	0.86		
		GL4	0.89		
	Intention to Play a Game Repeatedly	GL5	0.88		
		GL6	0.88		
Impulse Buying (Verhagen & Dolen, 2011)	Immediate	IB1	0.95	0.99	0.89
		IB2	0.95		
	Spontaneous	IB3	0.94		
		IB4	0.93		
	Dominated by Emotions	IB5	0.96		
		IB6	0.96		

Based on Table 2, the factor loadings of all items in the model were above 0.50. It indicated that the items consisting of gaming addiction (salience, tolerance, mood modification, relapse, withdrawal, conflict, and problems), gamer loyalty (gaming frequency, gaming history, and intention to play a game repeatedly), and impulse buying (immediate, spontaneous, and dominated by emotions) were declared valid and able to measure the complete modeling construct.

Table-3: Goodness of Fit Index

Goodness of Fit Index	Cut-off Value	Results
χ^2	Expected to be low	870.524
Df		296
χ^2- Significance Probability	≥ 0.05	0.000
CMIN/DF	≤ 3.00	2.941

Goodness of Fit Index	Cut-off Value	Results
RMR	< 0.05	0.015
NFI	≥ 0.90	0.909
IFI	≥0.90	0.938
TLI	≥0.90	0.931
CFI	≥0.90	0.938

Based on the Goodness of Fit measurement results in Table 3, the model suitability requirements were declared accepted. In addition, six measurements confirmed the Goodness of Fit Index. CMIN/DF = 2.941 (≤ 3.00) and RMR = 0.015 (< 0.05) met the criteria. NFI = 0.909, IFI = 0.938, TLI = 0.931, and CFI = 0.938 were all above 0.90, signifying that a model was fit and appropriate.

4. RESULTS AND DISCUSSION

4.1 Hypotheses Testing

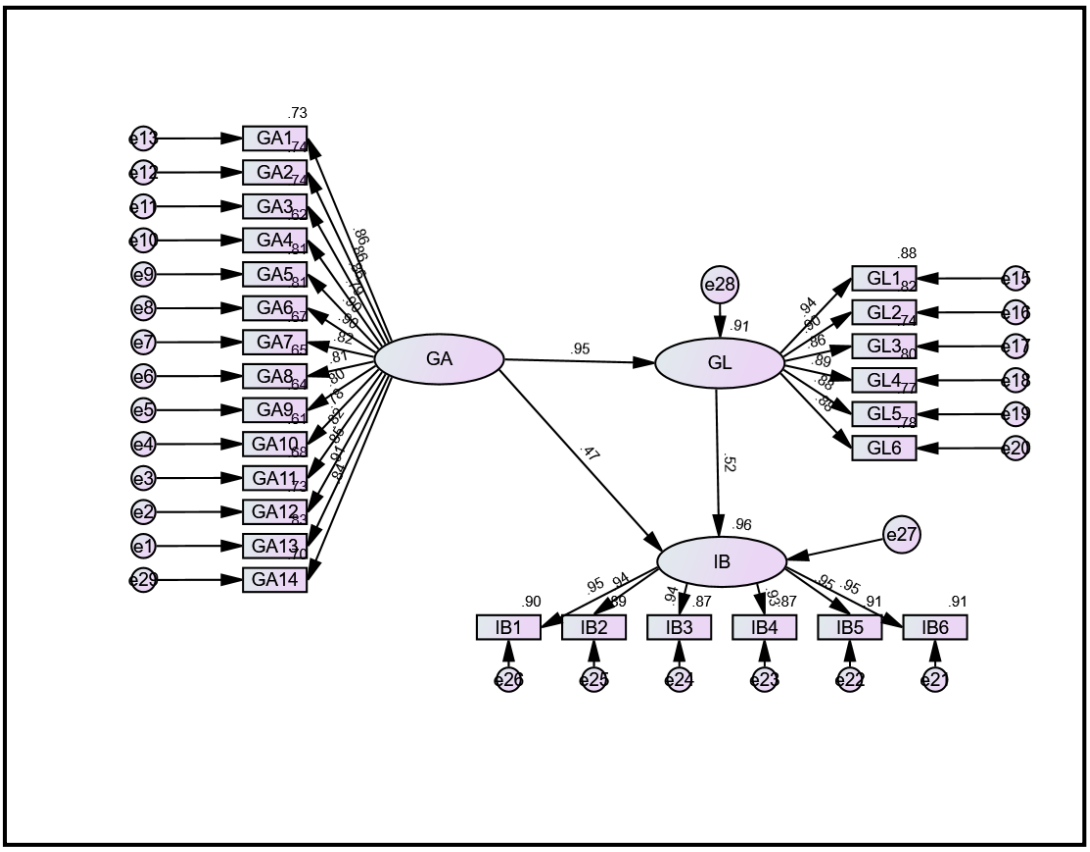

Figure-1: Full Structural Model Test

This study investigated the triangular model of three variables (the impact of gaming addiction and gamer loyalty on impulse buying). It examined the overall impact of the three variables, including the direct and indirect impacts of gaming addiction on impulse buying, with gamer loyalty as the mediating variable. This model was interconnected and supported the four hypotheses proposed. The t-score for the impact of gaming addiction on gamer loyalty was 23.208, which was greater than the t-table (1.96). Similarly, the p-value was less than 0.001, below 0.05 (α = 0.05). These findings supported the first hypothesis that gaming addiction significantly and positively impacted gamer loyalty. Something addictive may develop into a habit, fostering a pattern of behavioral loyalty toward online games (Liao *et al.*, 2020). Per the research of Balakrishnan and Griffiths (2018), it was deemed capable of increasing Generation Z's loyalty to online games.

In the second hypothesis, the t-score for the impact of gaming addiction on impulse buying was 6.011, and the p-value was less than 0.001; below 0.05 (α = 0.05). It demonstrated that gaming addiction had a positive and significant impact on impulse buying in Generation Z, corroborating the findings of Mubarok (2021) that addiction occasionally had a significant impact on impulse buying in Generation Z. It demonstrated the extreme behavior of Generation Z, which tended to be satisfied with immediate gratification. In addition, they had unstable self-control, leading them to frequently

purchase virtual items in online games. According to Table 1, members of Generation Z between the ages of 15 and 18 dominated online gaming. This finding contradicted previous research, which indicated that the majority of people who were addicted to playing online games were between the ages of 20 and 30 years old.

In the third hypothesis, the t-score of the impact of gamer loyalty on impulse buying was 6.731, with a p-value < 0.001; below 0.05 ($\alpha = 0.05$). Therefore, gamer loyalty had a positive and significant impact on impulse buying in Generation Z. In a study by Balakrishnan and Griffiths (2018), gamer loyalty directly affected purchase intention, so they suggested further research to explore other dimensions. The novelty in the present study uncovered that gamer loyalty directly had a critical role in increasing impulse buying in Generation Z. Loyalty increased the purchase of virtual items in online games and encouraged users to write reviews and share their enjoyment. In this study, male loyalty to online games was more significant than that of females. It contradicted prior research (Peng *et al*., 2008; Liao *et al*., 2020), demonstrating that women were typically more loyal to online games.

Table-4: Hypotheses Testing

Item			Std Estimate	S.E.	C.R.	p-values	Description
Gaming Addiction	--->	Gamer Loyalty	0.821	0.035	23.208	***	Accepted
Gaming Addiction	--->	Impulse Buying	0.428	0.070	6.011	***	Accepted
Gamer Loyalty	--->	Impuls Buying	0.553	0.082	6.731	***	Accepted

Furthermore, the indirect impact of the mediating variable was presented in Table 5 containing the Sobel test results.

Table-5: Sobel Test – Significance of Mediation

Item	Sobel test statistic	Two-tailed probability	Description
Gaming Addiction ---> Gamer Loyalty ---> Impulse Buying	6.48	***	Accepted

Based on Table 5, the value of the Sobel test statistic was 6.48, and the p-value was 0.001. It showed that the statistical value of the Sobel test was greater than the t-table (1.96), and the p-value obtained was less than 0.05 ($\alpha = 0.05$). These results indicated that gaming addiction had an indirect impact on impulse buying in Generation Z through gamer loyalty. Due to long-term access, loyal online game players might have developed a purchasing intent that could be influenced by addiction (Balakrishnan & Griffiths, 2018). In addition, it was discovered that gamer loyalty could convert the addictive nature of playing games into the impulsive purchase of virtual items in online games.

5. CONCLUSION

The impact of gaming addiction and gamer loyalty on impulse buying confirmed that the habit of playing video games among Generation Z in Indonesia might result in periodic impulsive purchases. Thus, gamers of Generation Z must always be prudent when playing online games. It was because online game addiction could lead to sporadic impulse purchases, causing a person to make purchases without considering their needs and eventually leading to regret. In the meantime, this research could provide online game companies with information and references to increase Generation Z's purchases of virtual items. Using rational thought and awareness, game developers and marketers should employ various techniques to foster player loyalty among online gamers. Thus, developers and marketers should base their decisions on something other than excessive online gaming addiction. As part of their CSR initiative, the gaming industry will need to address serious business ethics concerns if they treat addiction as a means of increasing impulse purchases. The results of this study are expected to serve as a literature review and source of information for future, more in-depth, and comprehensive research on Generation Z's online gaming and impulse buying of virtual in-game items. In addition, research on the impulse buying of virtual items in online games among Generation Z was still limited in Indonesia and globally. However, Generation Z could impact a country's population and economy.

6. LIMITATION AND RECOMMENDATION FOR FUTURE RESEARCH

This study provided empirical evidence of the impact of gaming addiction and gamer loyalty on impulse buying. Relatively young students dominated the samples, so the findings must be generalized with cautiousness. The present investigation must be replicated with a population-representative sample with broader gaming habits and more specific research objects. Despite these limitations, researchers identified gamer loyalty as an effective mediating variable

between gaming addiction and impulse buying. This research employed three primary constructs (gaming addiction, gamer loyalty, and impulse buying) so that future researchers can examine different variables to develop additional models of how online game developers and marketers can stimulate impulse buying.

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