ISSN: 2247-6172
Review of Applied Socio-Economic Research
(Volume 26, Issue 2 / 2023), pp. 67 - 82
URL: http://www.reaser.eu
e-mail: editors@reaser.eu

What Motivates Mobile Legends: Bang Bang Players' Loyalty and In-App Purchases? Investigation of Perceived Values Effect: Playfulness, Addiction, and Good Price (Evidence from Indonesia)

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Abstract. *Indonesia is ranked third as the country with the most gamers in the world. However, game developers have not capitalized on the large market in Indonesia to generate revenue using the freemium model. Therefore, this study aims to determine the factors that influence in-app purchase intention and loyalty in Mobile Legends: Bang Bang, with variables that include addiction, playfulness, and a good price. The object of research focuses on the Mobile Legends game because the number of downloaders in Indonesia is the largest in the world, but the amount of revenue is in fourth place in the world. This research uses a conclusive research design with a descriptive research method to test the research framework. The study used non-probability sampling with judgmental techniques with 220 respondents. The study used an electronic survey to collect the data, and data analysis was assessed using PLS-SEM. The study revealed that six out of eight hypotheses are supported. This study found that playfulness positively affects addiction, playfulness, and good price positively affect game loyalty, and addiction, good price, and loyalty positively affect in-app purchase intention. Meanwhile, the study found that addiction does not affect loyalty, and playfulness does not affect in-app purchase intention. Based on R^2, the variable that has a very high influence on in-app purchase intention is a good price, while one that has a very high influence on loyalty is playfulness.*

Keywords: In-App Purchase Intention, Loyalty, Playfulness, Addiction, Good Price, Mobile Legends: Bang Bang

JEL Codes: M30

1. Introduction

The internet penetration rate in Indonesia in 2022 reached 73.7%, with a total of 204.7 million people using the internet from the total population of Indonesia, which is 277.7 million (Nuraini et al., 2022). In terms of devices, the number of mobile device users in Indonesia has reached 370.7 million devices used by all Indonesians (Kemp, 2022). This trend is driving the growing popularity of online mobile gaming, which makes it easier for individuals to play video games via smartphones than it was previously when the game was only available to PC and console users (Nurfauzan & Thangchan, 2021; Pornpongtechavanich et al., 2022). Moreover, the COVID-19 pandemic made 46% of Indonesia's total population switch to online games (Siste et al., 2020). It was reported that the COVID-19 epidemic has increased the number of gamers in Indonesia to 77% of the overall population (Ericska et al., 2021). Therefore, the game industry in Indonesia contributes IDR 24.8 trillion to the total national GDP (Saputro, 2021). This makes Indonesia the third-biggest country with the most video game players in the world, below the Philippines and Thailand (Dihni, 2022).

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ISSN: 2247-6172
Review of Applied Socio-Economic Research
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Gamers in Indonesia spend an average of 11 hours per week playing games using their smartphones (Putri, 2022). Online games have many types and genres (e.g., fighting games, game battle royale, first-person shooter or FTS, Real-Time Strategy or RTS, vehicle simulation, life simulation, sports games, adventure games, and Role-Playing Games or RPG); among those genres, there are four types of games that have been very popular in Indonesia: MMORPGs, MMOFPS, MMORTS, and MOBAs (Putra & Ratnawati, 2020). MOBAs are a popular type of video game today. This is one of the most popular strategy video game subgenres (Pornpongtechavanich et al., 2022). MOBA, which stands for massive online battle arena, is a form of online game that mixes RTS (real-time strategy) with RPG (role-playing game) (Chan et al., 2020). Mobile Legends: Bang Bang is a well-known MOBA game (Safitri et al., 2023; T'ng et al., 2022). At the moment, Indonesia is the most active contributor in Mobile Legends across all regions, as evidenced by the 190 million downloads (Metasurya & Berlianto, 2022). Despite being huge from the user side, from the in-app purchase side, countries like Malaysia are superior, contributing $138 million in revenue, or around IDR 2 trillion, for the number of downloads, which is only 27 million. While Indonesia had such a large number of players, its in-app purchase contribution was only USD 119 million, or around IDR 1.7 trillion (Taufik, 2022).

Today's multiplayer games provide features like freemium that pique player interest since in excess of ninety percent of the apps available on mobile devices are free (Hsu & Lin, 2016). A freemium business is one that offers a product for free at first, then charges extra for more expensive goods or services. Examples of this include music, periodicals, social networks, cloud services, and, specifically, video games (Hamari et al., 2020), like Mobile Legends: Bang Bang. To attract customers, many app developers offer a free basic/trial version and charge a monthly fee for premium services. Others offer the full version for free and make money through advertising or in-app purchases for ad removal or value-added content. Thus, before buying a premium app, buyers usually try a trial or free version to familiarize themselves with its content and capabilities. Based on their trial or free experience, they decide to buy the commercial version (Hsu & Lin, 2015). Nonetheless, the number of freemium users was fairly tiny (just 2.2%) of all gamers, which created a severe issue for game creators (Ericska et al., 2021; Purnami & Agus, 2020), especially when freemium became the mobile game developer's main business model strategy. As a result, examining factors that motivate users to make in-app purchases is essential for game developers and marketers (Hsu & Lin, 2015).

Moreover, most casual games are free and monetized by in-app purchases and ads (Hsu & Lin, 2015, 2016). Thus, switching games does not cost the user. Since smartphones have limited capacity, users can quickly remove one game app and download another. Thus, as businesses seek strategies to maintain long-term consumer connections, understanding what motivates players to keep playing and promote a game is crucial (Molinillo et al., 2020). The more involvement and "stickiness" a game has, the more likely players are to make in-app purchases (Balakrishnan & Griffiths, 2018).

Investigating the behavioral background of mobile games has become an intriguing issue (T'ng et al., 2022). Despite the fact that numerous studies look into the behavioral and attitude backgrounds of mobile gamers, there is only a little study on the effect of perceived value on in-app purchases and loyalty in mobile gaming. At the same time, previous research has shown that product value is an essential element in boosting app purchases and usage in the e-commerce setting (Hsu & Lin, 2016). Furthermore, despite the importance of these two factors, little study has been undertaken to examine the relationship between the intention to make in-app purchases and the loyalty of players in playing specific games (Purnami & Agus, 2020b), which is Mobile Legends: Bang Bang. Therefore, this study aims to look at the factors that affect loyalty to a game and in-app purchase intention for games that use the freemium model as a method of earning revenue. This is done by using the components of perceived value, namely addiction, playfulness, and good price, which can encourage gamers to create a sense of loyalty and in-app purchase intention.

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2. Research Elaboration

2.1. Perceived Value

Perceived value is an individual's assessment in the form of perceptions of goods and services from companies based on the benefits and uses they receive (Hsiao & Chen, 2016). This perceived value has value components that influence gamers in playing games, namely addiction, playfulness, and good price. This perceived value component will encourage gamers to continue playing Mobile Legends: Bang Bang so that it can generate loyalty to Mobile Legends: Bang Bang and make gamers intend to buy the available premium features (Widodo & Balqiah, 2020).

2.2. Playfulness

Playfulness is an affective state that arises because of enjoyment and pleasure, causing interest in something (Hsiao & Chen, 2016). Playfulness can serve as a component in the development and maintenance of addictive behavior, such as excessive computer gaming (Berger et al., 2018). According to Lu & Wang (2008), perceived playfulness directly impacts online game addiction. Gamers who seek joyful experiences become frequent users. As a result, these players are more prone to acquire a psychological dependence on online games.

In order to attract gamers, playfulness is a key criterion. The more gamers believe the game is enjoyable to play, the more likely they are to return to it and create loyalty (Huang & Hsieh, 2011). According to the Purnami and Agus (2020) study, perceived playfulness influences player loyalty to the game. This indicates that the more gamers feel the game excites them, the more likely they are to continue playing the game. According to Widodo (2022), playfulness has a positive impact on loyalty to PUBG Mobile, and users who believe that PUBG Mobile is a fun game will prefer to play PUBG Mobile over other online mobile games if they want to play a game (Widodo & Balqiah, 2020). Moreover, based on Hsiao and Chen's (2016) and Cheung *et al.* (2021) research, playfulness has a positive impact on loyalty in mobile gaming, as well as a substantial impact on paid gamers' purchase intentions. Therefore, the hypothesis proposed in this study is:

H1: Playfulness has a positive addiction

H2: Playfulness has a positive influence on loyalty

H3: Playfulness has a positive influence on In-App Purchase Intention

2.3. Addiction

Addiction is the tendency to repeat and maintain appetitive behavior that causes pleasure and satisfaction (Herie & Skinner, 2014). When gamers experience addictive behavior, two behaviors will arise, namely loyalty and in-app purchase intention (Lu & Wang, 2008; Widodo & Balqiah, 2020). Balakrishnan and Griffiths (2018) revealed that addiction directly affects players' loyalty and also has the capacity to stimulate the users' intention to purchase in-game apps, so it can be concluded that the hypothesis proposed in this study is:

H4: Addiction has a positive influence on loyalty

H5: Addiction has a positive influence on In-App Purchase Intention

2.4. Good Price

Good Price is the main factor for measuring the sacrifice that consumers will give to get a product or feature in a game (Hsiao & Chen, 2016). Therefore, when gamers feel that the premium features being sold

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are priced accordingly, it will create a sense of loyalty (Cheng et al., 2008) and increase gamers' intention to buy the available premium features (Lu & Hsiao, 2010). Widodo and Balqiah (2020) and Liao *et al.* (2020) have discovered a positive relationship between a good price of in-app features and purchase intention of in-app features, so it can be concluded that the hypothesis proposed in this study is:

H6: Good Price has a positive influence on Loyalty

H7: Good Price has a positive influence on In-App Purchase Intention

2.5. Loyalty and In-app purchase intention

Loyalty is a consumer behavior that is loyal to goods and services so as to form repeat behavior (Teng, 2017). Meanwhile, In-App Purchase Intention is consumer behavior when they want to make purchases of available goods and features (Chang et al., 2019). Loyalty to the mobile game describes a gamer's inclination to continue playing or suggest that mobile game (Hsiao & Chen, 2016). When there is an ongoing connection with the game, loyalty increases gradually, and consumers may feel comfortable being loyal and supporting online games. Loyalty also encourages users to submit reviews, rank games and spread positive word of mouth (Balakrishnan & Griffiths, 2018). In the case of in-app purchases, loyalty is a significant factor. If gamers are willing to keep playing and recommending a mobile game, they are more likely to purchase it (Hsiao & Chen, 2016). Moreover, a recent study conducted by (Widodo & Balqiah, 2020) and (Purnami & Agus, 2020b) also confirmed the positive effect of loyalty in stimulating in-app purchases in mobile gaming. Therefore, this study postulates hypothesis :

H8: Loyalty has a positive influence on In-App Purchase Intention

Likewise, Figure 1 depicts the research model described above.

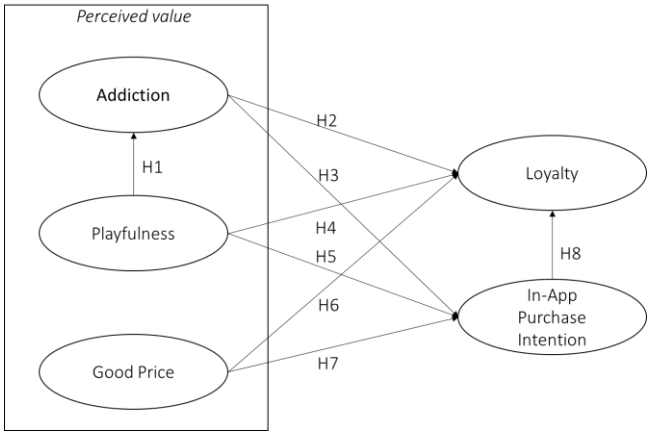


Fig1. Research model
Source: Created by authors

3. Methodology

This study has a research object, namely Mobile Legends: Bang Bang, which is a mobile game with a freemium model based on the Multiplayer Online Battle Arena (MOBA). This study uses a conclusive research design with a descriptive research design method because the purpose of this study is to examine the relationship between two or more variables using research hypotheses. This study also uses quantitative data obtained through a questionnaire, which is measured using a Likert scale of 1–5, ranging from "very disagree" (1) to "strongly agree" (5) (Malhotra, 2019). The type of research used in a descriptive research design is a cross-sectional design because the research collects information from each sample element of the population only once in a certain period (Malhotra, 2019).

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This study uses non-probability sampling with a judgemental technique because the selection process of the sample elements is based on the criteria determined by the researcher so that the sample taken is representative of the population. Respondents will be selected based on screening to be a sample of the existing population. The sample selection criteria in this study are Mobile Legends: Bang Bang players in Indonesia, still playing Mobile Legends: Bang Bang. It has been one month since they have not purchased diamonds and premium features of Mobile Legends: Bang Bang officially, and are aged 16 to 36 years (age profile of Mobile Legends: Bang Bang players in Indonesia). The extension of this research focuses on the country of Indonesia, which is divided into the JABODETABEK area and outside JABODETABEK, because the researcher wants to focus this research on phenomena that occur in Indonesia. Then, the time frame for this research was carried out from September 2022 and ends in December 2022.

Data from this study was obtained through questionnaires distributed through social media and online communities. The questionnaire was divided into two sessions: demographic profile and construct items. The items used to operationalize the construct were adapted through relevant previous research and modified to suit the research object. There are items that are used as questionnaire questions to represent each construct studied. Items for measuring addiction are adapted by Lu and Wang (2008) and Balakrishnan and Griffiths (2018). Items that measure playfulness are adapted from Hsiao and Chen (2016) and Cheung *et al.* (2021). Items that measure good price are adapted from Cheung *et al.* (2021) and Purnami and Agus (2020). Items that measure loyalty are adapted from Cheung et al. (2021) and Purnami and Agus (2020). Items that measure in-app purchase intention are adapted from Balakrishnan and Griffiths (2018) and Purnami and Agus (2020). All items were measured using a Likert scale of 1 – 5, ranging from "strongly disagree" (1) to "strongly agree" (5).

We used the SmartPLS 3.0 software for carrying out partial least squares (PLS) analysis on the research model (C.M. Ringle et al., 2015). We analyzed the measurement model (reliability and validity of the measurements) and followed by the structural model (examining the hypotheses) using (Anderson & Gerbing, 1988) recommended two-stage analytical approaches (Joseph F. Hair et al., 2019). A bootstrapping approach (5,000 resamples) was used to determine the significance of the loadings and path coefficients (Joseph F. Hair et al., 2019).

4. Results and Discussions

The research questionnaire was distributed online from November 9 to November 16, 2022. The number of respondents who filled out the questionnaire reached 230 respondents. However, there were 220 respondents who made it through the screening stage, and the researchers decided to use 215 respondents to be processed, or as much as 93% of the response rate. The results of the sample analysis of respondents show that 59.5% are male, most of the respondents are 16-20 years old with 75.8%, 56.3% are students with an income of IDR 1,000,000 – IDR 2,000,000, and in a week, they will play Mobile Legends: Bang Bang "as much as 2 – 3 times" by 40%. Table 1 is a summary of the respondent's profiles.

Respondents Demography

Table 1: Profile of respondents

Measure	Items	Frequency	%
Gender	Male	128	59.5
	Female	87	40.5
Domicile	Bekasi	23	10.7

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	Bogor	24	11.2
	Depok	31	14.4
	Jakarta	30	14
	Tangerang	87	40.5
	Outside JABODETABEK	20	9.3
Age	16 – 20	163	75.8
	21 – 25	52	24.2
Profession	Students	35	`6.3
	College Students	121	56.3
	Professional	57	26.5
	Doesn't work	1	0.5
	Entrepreneur	1	0.5
Income	< Rp 1.000.000	34	15.8
	Rp 1.000.000 – Rp 2.000.000	54	25.1
	Rp 2.000.000 – Rp 3.000.000	45	20.9
	Rp 3.000.000 – Rp 4.000.000	21	9.8
	Rp 4.000.000 – Rp 5.000.000	30	14
	> Rp 5.000.000	31	14.4
Monthly Spending on Mobile Legends: Bang Bang	< Rp 100.000	88	40.9
	Rp 100.000 – Rp 500.000	82	38.1
	Rp 500.000 – Rp 1.000.000	46	21.4
	> Rp 1.000.000	16	7.4
Play time per day	< 1 Hour	16	7,4
	1 – 2 Hour	50	23.3
	2 – 3 Hour	69	32.1
	3 – 4 Hour	52	24.2
	> 4Hour	28	13
Number of playing Mobile Legends: Bang Bang in a week	1 or < 1 / Week	6	2.8
	1 – 2 / Week	29	13.5
	2 – 3 / Week	86	40
	3 – 4 / Week	62	28.8
	> 4 / Week	32	14.9
Games played other than Mobile Legends: Bang Bang	Yes, I play more than one game	192	89.3
	No, I am only play Mobile Legends: Bang Bang	23	10.7

Source: Authors' own work

Measurement Model Analysis

The study examines four components of measurement model analysis, which consist of outer loadings, indicator reliability, concept reliability, convergent validity, and discriminant validity (Ringle et al., 2015; Ringle et al., 2018). The reliability of latent variables was determined using outer loadings, indicator reliability, and composite reliability (Fornell & Larcker, 1981; Hair et al., 2014; Hair et al., 2016). Indicators with an outer loading of 0.7 or above are favorable (Hair et al., 2014; Wong, 2013). Based on Table 4, the model contained all components with a value of 0.7 or above.

Internal consistency reliability is estimated using composite reliability in this study. Good internal reliability, according to Wong (2013), should have a threshold value of 0.7 or greater. The composite

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reliability for all variables ranged between 0.903 and 0.958 (Table 2), indicating that the constructs' reliability is satisfactory. For testing convergent validity, this study employed average variance extracted (AVE). The amount of variance captured by a construct in relation to the amount of variance owing to measurement error is defined as AVE (Hair et al., 2017). The AVE value should be more than the 0.50 threshold value to be deemed to have good convergent validity. According to Table 2, all constructs revealed strong convergent validity, with AVE values ranging from 0.700 to 0.849, which are greater than the threshold value of 0.50 (Fornell & Larcker, 1981).

Table 2: Construct reliability and validity

Variable	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Addiction	0.856	0.903	0.700
Playfulness	0.945	0.958	0.821
Good Price	0.902	0.928	0.719
Loyalty	0.906	0.941	0.842
In-Apps Purchase Intention	0.908	0.931	0.729

Source: Authors' own work

The Fornell-Larcker criterion, cross-loadings, and the HTMT criterion were used to assess discriminant validity. Wong (2013) proposed that the square root of average variance extracted from each latent variable be greater than the correlations among the latent variables for the Fornell-Larcker criterion. Hair et al. (2014) proposed that off-diagonal values in latent variable correlation should be smaller than diagonal values. The square root of AVE occurs in the diagonal cells, while correlations appear below it, as shown in Table 3, and diagonal values (in bold) are greater than off-diagonal values. Furthermore, the cross-loading score for all constructions met the 0.7 minimal threshold (Table 4). Because of the shortcomings of the Fornell-Larcker criterion and because the HTMT criterion is also utilized in this work, we used the HTMT ratio, as indicated by Henseler et al. (2009). According to Gold et al. (2001), values less than 0.90 (HTMT 0.90) nevertheless represent discriminant validity. Based on Table 5, the construct HTMT values are less than 0.90. So, it can be concluded that the model has a good discriminant validity.

Table 3: Fornell-Larcker criterion (discriminant analysis)

	Addiction	Good Price	In-Apps Purchase Intention	Loyalty	Playfulness
Addiction	***0.837***				
Good Price	0.763	***0.848***			
In-Apps Purchase Intention	0.624	0.654	***0.854***		
Loyalty	0.770	0.768	0.642	***0.918***	
Playfulness	0.810	0.808	0.603	0.833	***0.906***

Source: Authors' own work

Table 4: Outer loading and cross-loading

	Addiction	Good Price	In-Apps Purchase Intention	Loyalty	Playfulness
Addict_1	**0.867**	0.664	0.531	0.697	0.751
Addict_2	**0.760**	0.538	0.473	0.548	0.612
Addict_4	**0.847**	0.624	0.527	0.648	0.650
Addict_5	**0.869**	0.718	0.555	0.674	0.691
GoodPrice__1	0.703	**0.876**	0.545	0.703	0.692
GoodPrice__2	0.550	**0.797**	0.533	0.533	0.615
GoodPrice__3	0.698	**0.874**	0.553	0.728	0.737

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GoodPrice__4	0.630	**0.836**	0.564	0.604	0.660
GoodPrice__5	0.643	**0.855**	0.580	0.672	0.715
InAppPurch_1	0.554	0.581	**0.884**	0.562	0.534
InAppPurch_2	0.662	0.679	**0.845**	0.708	0.645
InAppPurch_3	0.528	0.548	**0.873**	0.534	0.517
InAppPurch_4	0.423	0.428	**0.812**	0.415	0.408
InAppPurch_5	0.426	0.485	**0.855**	0.435	0.396
Loyal_3	0.646	0.639	0.570	**0.881**	0.688
Loyal_4	0.735	0.730	0.598	**0.938**	0.802
Loyal_5	0.735	0.741	0.598	**0.933**	0.799
Playful_1	0.763	0.758	0.573	0.784	**0.915**
Playful_2	0.715	0.720	0.566	0.743	**0.893**
Playful_3	0.715	0.716	0.570	0.735	**0.873**
Playful_4	0.746	0.732	0.546	0.767	**0.928**
Playful_5	0.730	0.734	0.472	0.744	**0.921**

Source: Authors' own work

Table 5: Heterotrait-monotrait ratio (HTMT) (discriminant validity)

	Addiction	**Good Price**	**In-Apps Purchase Intention**	**Loyalty**	**Playfulness**
Addiction					
Good Price	0.863				
In-Apps Purchase Intention	0.687	0.704			
Loyalty	0.870	0.844	0.684		
Playfulness	0.898	0.873	0.630	0.898	

Source: Authors' own work

Structural Model Analysis

The inner, or structural, model is then estimated, which can be done by taking into account estimations of the path coefficient, coefficient of determination (R2), effect size (f2), and predictive relevance (Q2) (Henseler et al., 2009). The PLS-SEM, unlike the CB-SEM, does not necessitate the evaluation of goodness-of-fit measures, according to (Ringle et al., 2018). It sets the minimal minimum of statistics and data normality criteria. As a result, R2 was used to evaluate the model's fit. Figure 2 shows that the R2 for addiction was 0.656, 0.734 for 0.488 for in-app purchase intention. It means that 65.6% of the addiction variance could be explained by playfulness. Moreover, 73.4% of the variance in loyalty and 48.8% of the variance in in-app purchase intention could be explained by variable addiction, playfulness, and a good price. All of the R2 values are above the 0.26 threshold, so it can be concluded that addiction, playfulness, and a good price highly predict loyalty and in-app purchase intention (Cohen, 1988).

Moreover, In the present study, predictive relevance (Q2) assessments were performed employing blindfolding techniques versus endogenous factors in reflection measurements (Hair et al., 2014). Meanwhile, the blindfolding is done with the omission distance (O.D.) of seven different settings (Hair et al., 2011). The value of Q2 must be greater than 0 for a structural model to be thought to have excellent predictive capacity (Hair et al., 2014). Table 6 displays Q2 values of 0.454 for addiction, 0.606 for loyalty, and 0.333 for in-app purchase intention variables. Because all endogenous variable Q2 values are greater than zero, the research model has strong predictive relevance. Further, the f2 was performed to see whether exogenous constructs had a significant influence on endogenous constructs. According to Hair et al. (2014), f2 values of 0.02, 0.15, and 0.35, respectively, represent the small, medium, and substantial effects of exogenous constructs on endogenous constructs.

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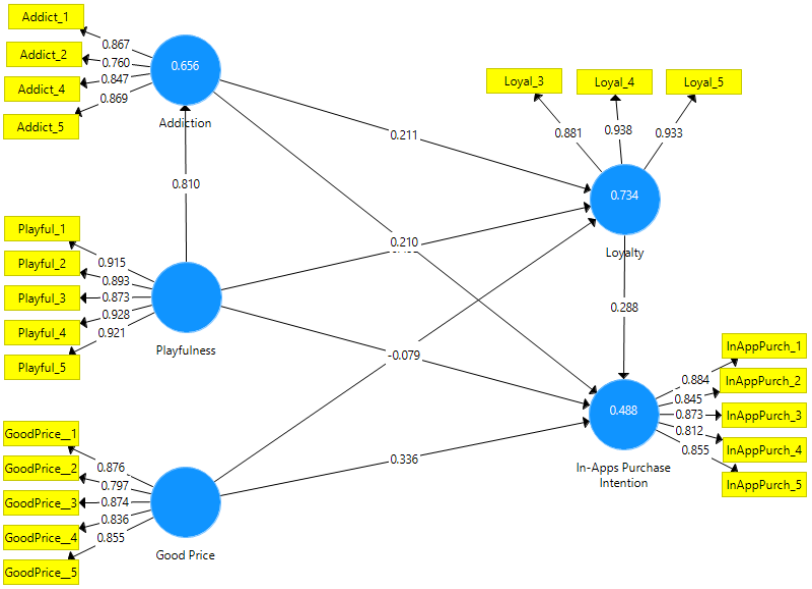


Fig 2: Results of PLS algorithm

To examine the link between latent constructs and validate the conceptual model, a structural model assessment is performed (Hair et al., 2014; Wong, 2013). The current study analyzed the structural model after analyzing the measurement model by using bootstrap on 5000 samples to assess the level of significance of the path coefficient significance (Hair et al., 2017; Henseler et al., 2009). The study's hypothesis testing was done by looking at the β and T values of Statistics (Chin, 1998).

Table 6. Path analysis

		(β)	T Value	P Value	Decision	R2	f2	Q2
H1	Playfulness →Addiction	0.810	22.652	0.000	Supported	0.656	1.911	0.454
H2	Playfulness → Loyalty	0.495	4.155	0.000	Supported	0.734	0.237	0.606
H4	Addiction →Loyalty	0.211	1.468	0.071	Not Supported		0.052	
H6	Good Price → Loyalty	0.207	1.999	0.023	Supported		0.050	
H3	Playfulness → In-app purchase intention	-0.079	0.638	0.262	Not Supported	0.488	0.003	0.333
H5	Addiction →In-app purchase intention	0.210	1.860	0.031	Supported		0.025	
H7	Good Price → In-app purchase intention	0.336	2.597	0.005	Supported		0.066	
H8	Loyalty → In-app	0.288	2.102	0.018	Supported		0.043	

ISSN: 2247-6172
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	purchase intention							

Source: Authors' own work

According to Table 6, six of the eight hypotheses tested in the study were supported. Playfulness has a positive effect on addiction to Mobile Legends: Bang Bang (β= 0.810, T = 22,652, P = 0.000, with a substantial effect size where f2 = 1.911). Therefore, hypothesis 1 is supported. In terms of loyalty to play Mobile Legends: Bang Bang, playfulness (β= 0.495, T = 4.155, P = 0.023, with a medium effect size where f2 = 0.237) and a good price (β = 0.207, T = 1.999, P = 0.000, with a medium effect size where f2 = 0.050) are found positively affect loyalty, while addiction is found to be not significant (β = 0.211, T = 1.468, P = 0.071, with a small effect size where f2 = 0.052). Therefore, we can conclude that hypotheses 2 and 6 are supported, while hypotheses 4 is not. In terms of in-app purchase intention on Mobile Legends Bang Bang, addiction (β = 0.210, T = 1.860, P = 0.031, with a small effect size where f2 = 0.025), a good price (β = 0.336, T = 2.597, P = 0.005, with a small effect size where f2 = 0.066), and loyalty (β = 0.288, T = 2.102, P = 0.018, with a small effect size where f2 = 0.043) are found positively affect gamers in-app purchase behavior, while playfulness is found to be insignificant (β = -0.079, T = 0.638, P = 0.262, with no effect size). Therefore, we can conclude that hypotheses 5, 7, and 8 are supported, while playfulness is not.

5. Discussion

The study investigates how perceived values in the form of playfulness, addiction, and a good price are affected by Mobile Legends: Bang Bang loyalty and in-app purchases in Indonesia as the biggest players' contributors. Based on the hypothesis testing result, this study found that playfulness positively increased players' addiction to mobile gaming. This result strengthened the previous research results that have been conducted (Berger et al., 2018; Lu & Wang, 2008). Online gaming offers a pleasurable experience to its players. This experience makes the players keep coming back and increase their time for play to achieve self-satisfaction. As a result, these players are more likely to become psychologically dependent on online gaming or become game addicts.

In terms of loyalty, this study result shows that playfulness and a good price are factors that positively increase player loyalty to Mobile Legends: Bang Bang, while addiction is not significant. Several studies confirm the positive effect of playfulness on loyalty for mobile gaming (Huang & Hsieh, 2011; Purnami & Agus, 2020b; Widodo & Balqiah, 2020). According to Cheung *et al.* (2021), playfulness has a significant effect on loyalty because game developers continue to develop the playing experience by creating storylines or game techniques that lead to enjoyment or pleasure in playing; this will build loyalty between players gamers and games played. It can be concluded that Mobile Legends: Bang Bang players in Indonesia will be loyal to Mobile Legends when MOONTON continues to make innovations that make gamers feel happy when playing, and there are the latest gameplay patches/updates on games that make Mobile Legends: Bang Bang much more fun than previously. This will build the loyalty of gamers in Indonesia towards Mobile Legends: Bang Bang in Indonesia.

Moreover, the good price of features sold in Mobile Legends: Bang Bang has a positive effect on loyalty. This is similar to the research conducted by Liao *et al.* (2020) that states that a good price has a significant effect on loyalty because when gamers feel that the game they are playing has features that are sold at the right price, it is likely that a sense of loyalty will be created for the game they are playing. It can be concluded that Mobile Legends: Bang Bang players in Indonesia will sacrifice money or give their money to get featured in a game when they already have a sense of loyalty to the game. This is because a certain

ISSN: 2247-6172
Review of Applied Socio-Economic Research
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level of consumer confidence in the money they sacrifice is commensurate with the services or features they get in the game.

In terms of in-app purchases, the study result shows that addiction, a good price, and loyalty are factors that positively drive player intention to buy, while the effect of playfulness is not significant. The positive effect of addiction on in-app purchase intention confirms the previous research findings (Balakrishnan & Griffiths, 2018; Lu & Wang, 2008; Widodo & Balqiah, 2020). Based on the descriptive analysis, the majority of the respondents, or 56.3%, play Mobile Legends: Bang Bang between 2 and 4 hours a day; even 13% of the respondents claim that they play more than 4 hours a day. Online game addiction is defined as a psychological reliance on playing games online that compels gamers to play a given game incessantly. Addiction to internet gaming increases players' competitiveness. Players that are addicted will keep looking for winnings, even if it costs them money. Moreover, this study also confirms the positive effect of good price perception on in-app purchase intention. Based on the descriptive statistics result, the majority of respondents, or 59.6%, have average spending on Mobile Legends: Bang Bang between Rp 100.000 and Rp 1.000.000, or a range of 6.6 USD to 66.6 USD a month. Some of them, or 7.4%, could spend more than 66.6 USD a month. It can be concluded that when players perceived the price as reasonable, they would consider making an in-app purchase in the near future.

The study also found that loyalty to Mobile Legends: Bang Bang has a positive influence on in-app purchase intention. This is similar to the research conducted by Hsiao and Chen (2016), who found that loyalty has a significant effect on in-app purchase intention because loyalty is an important factor in the context of in-app purchase intention. If players are willing to continue playing and recommend the games they play, they will have a stronger intention to pay for the game features provided. It can be concluded that Mobile Legends: Bang Bang players in Indonesia will have the intention to buy the features provided by Mobile Legends when they are willing to continue playing and will recommend the Mobile Legends game.

Lastly, the study found that playfulness does not affect in-app purchases. This is because gamers in Indonesia will only consider the games they play as fun and will not consider fun games as the reason why they want to buy the features available in mobile games. This is similar to research conducted by Widodo and Balqiah (2020), which stated that playfulness does not have a significant effect on in-app purchase intention because gamers in Indonesia will only perceive the games they play as fun and will not consider fun games as a reason, why they want to buy the features available in mobile games.

6. Conclusions and Implication

The study investigates the effect of the variables addiction, playfulness, and good price on loyalty and in-app purchase intention. It can be concluded that there are six hypotheses that have a significant effect and two that are not significant. These six hypotheses consist of the relationships between playfulness and addiction, playfulness and good price to loyalty, and addiction, good price, and loyalty to in-app purchase intention. Meanwhile, the two hypotheses that are not significant consist of addiction to loyalty and playfulness to in-app purchase intention.

After this research, the researcher makes recommendations for future research and gives advice to help Mobile Legends: Bang Bang increase loyalty and in-app purchase intention. Researchers suggest several managerial implications for the game developer. To take advantage of playfulness, Mobile Legends: Bang Bang needs to increase the graphic and visual quality of heroes, skins, recalls, and premium features to make them more realistic and fascinating. Second, Mobile Legends: Bang Bang can create top worldwide edition skins with greater visuals and details to start improving visual quality. This skin has exclusive music and map presentations. This will encourage gamers to play often to reach the top of the worldwide

ISSN: 2247-6172
Review of Applied Socio-Economic Research
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leaderboard and acquire this exclusive skin. Third, developers can increase penalties for players who frequently go AFK (away from the keyboard) or leave the game, which imbalances the number of players fighting, like in Wild Rift. This is necessary to keep Mobile Legends: Bang Bang players entertained and relieve stress.

In terms of good prices, developers can increase loyalty through trading skin events, where players can trade their skins for other skins when they win the MCL (MLB Championship League) every Saturday. Players can exchange skins with the same or fewer diamonds in this trading event. This event gives gamers cheaper features and makes them more devoted to MCL. Second, the developer has to offer discount vouchers for premium features when customers fill up on diamonds every month to keep players loyal. Third, developers can boost loyalty by hosting disaster relief or other charitable events. 5%–10% of diamond sales will be donated to the charity event. This can boost Mobile Legends loyalty: Bang Bang because gamers in Indonesia who have a habit of dividing their money to top up some of the games they play will focus on top-ups on Mobile Legends: Bang Bang since they know their top-up results will help others.

Developers can reward the top 100 players on the global leaderboard each season and offer new goals for gamers with the most heroes and emblems by taking advantage of addiction. The top worldwide rank gets 5,000 diamonds, the second 4,000, the third 3,000, the fourth to the tenth 2000, the fifth to fifty-one 1,500, and the fifty-first to one hundredth 1000. Second, developers can design new prizes for Mobile Legends: Bang Bang gamers who complete all heroes and emblems.

Loyalty events can boost in-app purchases. On the last day, premium products will be randomly selected on a spin wheel that can be cycled five times for 50 diamonds. Mobile Legends: Bang Bang will be recalled to maintain streaks and perhaps get discounted premium features. Developers can then create point-reward loyalty events. Mobile Legends: Bang Bang premium products receive developer points. These points reward loyal Mobile Legends: Bang Bang top-up players.

The researcher would like to make some suggestions for future research. Since most respondents in this survey were from JABODETABEK, the researcher suggests that future studies include a larger area. According to Budianto (2021), , Java contributes to 52% of Mobile Legends Bang Bang players; Sumatra contributes 29.38%; Kalimantan contributes 7.41%; Sulawesi contributes 6.29%; Bali contributes 3.73%; and Papua contributes 0.54%. Yogyakarta, Bandung, Surabaya, and Semarang have the highest Java proportion outside JABODETABEK. Second, future studies can focus on a certain gender, such as men or women, to better understand purchase behavior and help game makers develop more tailored techniques. Third, in this study, research only uses addiction, playfulness, and good price, which affect loyalty and in-app purchase intention. Future research could add other variables that can affect loyalty and in-app purchase intention, such as connectedness, rewards, and access flexibility. Fourth, for future research, the research model used by researchers can be used for other online mobile games that use in-app purchases as a source of game developer revenue, such as Clash of Clans, Free Fire, Arena of Valor, and Wild Rift. This will be useful to deepen the factors that will influence players' purchases in mobile game applications.

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Manuscript received: 08.06.2023

Manuscript received in revised form: 26.07.2023

Manuscript accepted: 04.09.2023