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A study of Flow and Its Factors Towards Compulsive Buying Based on Player Behavior of Mobile Legends In-Game Items

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Abstract: Purpose - Examining flow of Mobile Legends player correlating to compulsive buying on in-game items and factors related to flow such as enjoyment, skills, difficulty and avatar identification. **Methodology/design** - The data were obtained using surveys distributed via several gaming communities' group chats and channels including Discord and WhatsApp, where they were collected from 275 respondents. **Findings** - The research revealed that flow does have an impact on compulsive buying. Additionally, challenge and telepresence have a favorable impact on flow where skill and fun were not encouraged. Meanwhile, avatar identification is positively impacted by avatar attractiveness and personalization. Avatar identification thus has a favorable impact on flow. This study focused on the connection between compulsive shopping, avatar identity, and player behavior. **Originality/value** - The research hypotheses for this study can be summed up as: How can flow positively affect compulsive buying? Therefore, this study aims to identify and examine its significance through the variables of player behavior and avatar identification, which are the stimuli of flow in games.

Keyword: Mobile games, Mobile Legends, Enjoyment, Skill, Challenge, Telepresence, Flow, Avatar attractiveness, Avatar customization, Avatar identification, Compulsive buying **Paper type** Research Paper

INTRODUCTION

Video games are one of the most popular forms of entertainment today. Young and adults love to play games in their spare time while unwinding. In the past, people used to play their games on consoles like Playstation, SNES or N64. Today, most people can play their favorite

video games anywhere and anytime because now everyone can play games on cell phones. In recent years, the gaming industry's most popular game category has been mobile games.

Based on research results from Nam and Kim (2020) said that the top 10 mobile games hold around 70% of the market share. In the growth of the game industry, the mobile games segment plays a huge role in terms of the growth. In a recent study, Gamer in mobile platforms generated revenue from \$56 billion (2017) to predicted \$116.4 billion (2024); Resulting from 2.6 billion mobile gamer who played on PC and console combined of 1.5 billion users. (Newzoo, 2021)

As the popular games are widely available as free-to-download (Jang & Chung, 2021; Wang, 2022), developers have come up with other ways to generate revenue. Such a method is called in-app/in-game purchase. Users are offered a set of item(s) or currency to purchase from a store that could provide various value to their gaming experience. It is generally divided into two categories, non-functional and functional items. Appearances alteration with no competitive advantages are called non-functional items. Whereas, functional attributes enhancement that gives a competitive edge is called functional items. However, of the two, most users favor the former more than the other as it does not create a gap between the paid and unpaid users' gameplay experiences (Marder et al., 2019; Wang, Lowry, Luo, & Li, 2022). The non-functional items normally come in the form of character cosmetics or commonly known as skin(s). Some available in a head-to-toe transformation package, and some only available in pieces (i.e. arms, legs, torso, head). Depending on its design and rarity their prices could greatly differ, hence the reason they have been the major revenue generators for a lot of mobile games companies.

Study involving online games on player purchase behavior has been studied in several research. Ghazali et al. (2019) on Pokemon GO, King et al. (2020) on Fortnite and Ghazali et al. (2021) on Dota 2. Meanwhile, Liao et al (2018) said it was indicated that avatar identification positively influences flow state. However, both of those research did not explore and explain about compulsive buying behavior of players, which is a common occurrence in the game Mobile Legends. This study tries to find the correlation between flow state and compulsive buying on mobile games: Mobile Legends, as shown by Mason et al (2021) where flow states affect compulsive buying in online shopping. Therefore, the main objective of this study is to confirm whether the same phenomenon, flow states affecting compulsive behavior, occurs in Mobile Legends as well.

Sourced from Google Analytics in 2012 to 2013, in Indonesia most online game users are teenagers (15 to 25 years) which contributes to 80% of online gamers in the area of big cities in Java (Jakarta, Surabaya, etc). According to Mawalia, 2020, shifting trends from PC online games to smartphones enable gamers to play anywhere and anytime; in looking for internet network access, online gamers can spend up to 6 hours a day. One of the popular mobile games is Mobile Legends: Bang-Bang, developed by Moonton and released on Android in Indonesia on 11th July. Mobile Legends is a MOBA (Massive Online Battle Arena) genre mobile game. In recent data published by Clement, 2023 in Statista, Mobile Legends is the most popular MOBA gaming apps by the most downloaded gaming apps worldwide in July 2023 by 5.5 million downloads, leaving a huge gap to Honor of Kings with 2.6 million downloads for the second most downloaded MOBA gaming apps.

In-game items are readily available and can be purchased in the game's store. However, in Mobile Legends, special character skins are unable to be obtained through direct purchase. Hence, to obtain special character skin on Mobile Legends, players have to buy using real currency to participate in the gacha mechanic with a limited time window and the more diamonds spent on the gacha, the higher the chances of player to obtain special character skin. This study targets player experience on enjoyment, skills, challenge, telepresence and avatar identification toward flow, that leads to compulsive buying in online mobile games specifically on Mobile Legends.

One of the ways for mobile game developers to gain revenue is through the in-game sale model by selling these in-game goods. Virtual goods and various forms of in-game content have become a de facto revenue model for developers (Below, Koskinen, Paavilainen, & Hamari, 2016; Hamari, 2015; Lehdonvirta, 2009). However, some game developers experience a dilemma where games are played for free but users don't want to make purchases (Han & Windsor, 2013). This has not stopped game developers from thinking creatively in order to increase their revenue through special event items. This event was made interesting to motivate players to pay large amounts of money in a certain period of time to get rare items (Shibuya, A.,et al. 2016). In addition to increasing purchases, game developers provide customization features. Customization features are basically divided into two types, namely functional and aesthetic (Kim, K.,et al, 2015). Functional customization designed to meet targets for specific events, or increase the size of the display for better viewing. Aesthetic customization includes changing the appearance of the avatar or changing the screen saver. Both have an impact on player psychology which affects enjoyment (Kim, K.,et al, 2015).

One of the methods for users to obtain their desired item(s) is through a system dubbed as "Gacha". It originated from a product sold by a Japanese toy company, Bandai. They sell toys in capsule packaging, which can be purchased through a vending machine called "Gachapon". This particular type of vending machine implements an element of randomness, which is basically a lottery system. Customers could purchase a coin that will be used to interact with "Gachapon". After the coin has been inserted, customers need to turn the machine's knob several times until a random capsule comes out, providing them an item that is offered in the particular "Gachapon". Often it would be a common time, but if lucky enough, rare/limited-edition items could come up which are sought after by toy collectors (Zenpop, 2023).

Dating back to 2011, the same system has been implemented by free-to-play mobile game developers. It is used as a method to obtain the main aspect of said games. Some in the form of character acquisition, some in the form of skin(s), some in the form of card(s). Nowadays, they also added the element of scarcity by limiting the availability time of the item, promptly encouraging users to spend as soon as possible to ensure the item(s) acquisition (Lakić et al, 2023).

An article was published to criticize the gacha system for profiting off of users', which are predominantly children and teenagers, naivety exploitation. The author made a case that gacha games are akin to gambling, as it implements a paywall for randomized results (Shimbun, 2012). This has instigated several countries to enforce game companies being obligated to reveal the rates of getting the item(s) from gacha systems or to in some cases outright banning gacha mechanics (Wired, 2012; The Verge, 2017).

In Indonesia, Mobile Legends: Bang Bang has an average of 8 million daily users (KumparanTECH., 2017) and produced revenue exceeding \$ 5.3 million in 2017 (Lopez., 2017). When games do not charge users to access or play them, they will use in-game microtransactions to generate revenue and purchasing behavior plays an important role in it (Mäntymäki & Salo., 2013). This means that game developers will use player buying behavior to make a profit by giving the player skins, costume or cosmetics to buy. Purchasing the in-game items requires an in-game currency called diamond, and players need to refill their diamonds using real money to

be able to buy items in the in-game shop. Mobile Legends also gives the option to join an exclusive membership called Starlight at a price of IDR 165,900 or Starlight Member Plus at IDR 331,890 with various benefits that can be obtained such as exclusive avatar borders, exclusive Starlight notifications, recall effects, and spawn effects. This can influence someone's behavior to buy by giving a special "status" with free and exclusive items that can only be obtained by joining a Starlight membership.

METHOD

Sampling and Procedures

Sampling technique utilized in this study is a non-probability sampling. As respondents in this study have to be a gamer who have experienced playing Mobile Legends, non-probability Sampling is the most suitable method to collect respondent data for this study more efficiently. Hence, this method is deemed more fitting to test the proposed theoretical assumptions (Hulland et al, 2017). Snowball sampling design of a non probability sampling was employed to reach respondents joined in a group of a gamer or gaming community. Data of respondents collected as many as 275 samples using existing rules of sample size: Sample-to-item ratio, with the minimum ratio should be 5-to-1, respondent to item in a study. (Memon, 2020)

Online Google Forms used to collect primary data of respondents. The questionnaires were designed using Google Forms on July 3rd, 2023 to August 11th, 2023. Questionnaires were distributed on social media platforms such as Instagram, WhatsApp, Facebook and personal approach to Mobile Legends Player Community or Mobile Legends Group to recruit only Mobile Legends Player. To gain data only from recent Mobile Legends Player and those who have shopped in game items, two filter questions were asked of "Do you play Mobile Legends in the last 6 months" and "Do you ever have purchased in Mobile Legends" as a start of the questionnaires. Those who have played Mobile Legends in recent 6 months and purchased in Mobile Legends are filtered in, and else are filtered out.

Variables Measurement

All Instruments were measured on multi-item scales and self-report referenced from previous studies. The scales are seven-point, subsequently one for strongly disagree to seven for strongly agree. Player's behavior Construct of Enjoyment, Skill, Challenge, Telepresence were measured with 5-items adapted from Ghazali et al (2021). Avatar Identification Construct of Avatar Attractiveness (3-items), Avatar Customization (3-Items) adapted from Ghazali et al (2021) and Avatar Identification (4-Items) adapted from Liao et al (2018)/ flow construct with 6-items adapted from Ghazali et al (2021) and Mason et al (2022). For compulsive buying construct was adapted from Mason et al (2022). All the items were adapted from English and translated to Indonesian. Instruments were tested with ten potential participants whether the questions wording is clear before data were collected. At the end of the instrument, questions on participant information were included on their gender, age, income, region, occupation, spend on the game, how long they have been playing, Frequencies in a week, how long they play each session, and items they have collected.

RESULTS AND DISCUSSION

Demographic Profiles of The Respondents

The purpose of this study is to look into the various factors that could impact consumers' Based on the results obtained in Table 1. from the questionnaire, 73.45% were men and 26.55% were females. Meanwhile for their age, ages from 17 to 22 have the highest percentage with

50.91% followed by ages 23 to 28 with 47.27% and remaining ages 29 to 34 with 1.82%. For the region, West Java has the highest score with 37.45% followed by Central Java with 21.82%. Other data obtained is their occupation with 40.73% of the respondents being students and 37.09% being employees.

Items	Characteristics	Frequencies	Percentage
Gender	Male	202	73.45%
	Female	73	26.55%
Age	17-22	140	50.91%
	23-28	130	47.27%
	29-34	5	1.82%
Region	Banten	22	8.00%
	Jakarta	40	14.55%
	West Java	103	37.45%
	Central Java	60	21.82%
	East Java	20	7.27%
	Others	30	10.91%
Occupation	Student	112	40.73%
	Employee	102	37.09%
	Freelancer	8	2.91%
	Entrepreneur	53	19.27%
Income per Month	< Rp 2.000.000	135	49.09%
	Rp 2.000.000 - Rp 5.000.000	77	28.00%
	Rp 5.000.000 - Rp 10.000.000	48	17.45%
	> Rp 10.000.000	15	5.45%
Spanding on gaming product per	< Rp 1.000.000	235	85.45%
month	Rp 1.000.000 - Rp 3.000.000	36	13.09%

	Rp 3.000.000 - Rp 5.000.000	4	1.45%
How long have you played Mobile Legends	0 - 1 year	37	13.45%
	2 - 3 years	83	30.18%
	4 - 5 years	83	30.18%
	> 5 years	72	26.18%
How often in a day	1 - 2 day(s)	33	12.00%
	3 - 4 days	48	17.45%
	5 - 6 days	81	29.45%
	Everyday	113	41.09%
How much time is spent playing the game	1 - 2 hour(s)	77	28.00%
	3 - 5 hours	136	49.45%
	6 - 8 hours	51	18.55%
	9 - 12 hours	6	2.18%
	> 12 hours	5	1.82%
How many items were purchased in the game	< 100	234	85.09%
	100 - 200	15	5.45%
	200 - 300	8	2.91%
	300 - 400	10	3.64%
	> 400	8	2.91%

Common Method Variance Assessment

A full collinearity test was added and executed based on variance inflation factors to detect any potential Common Method Variance (CMV). According to Kock and Lynn (2012) There would be an indication of pathological collinearity if VIF value is greater than 3.3. Thus, as shown in Table 2. shown VIF value ranging between 1.3 to 2.9, meaning all variables are not subjected to CMV. Discriminant Validity shown in Table 2, revealed there is no issue between construct and each construct shared with the other latent variables as the AVE for each construct has greater significance than the variance of each construct shared with other. (Hair et al, 2017).

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Variables	Enjoyment	Skills	nge se	sence	Identification	Attractivene	Customizati	Flow
					Identifiedution	SS	on	
VIF	1.525	1.491	1.319	2.816	2.986	2.152	2.114	2.132

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Measurement Model

A factor analysis and a varimax rotation was performed on every variable to define the latent dimension underline the data. Factor loading of 0.5 was used as a cut-off value in each item to be included in each factor. The factor analysis appropriateness was confirmed by KMO (Kaiser-Meyer-Olkin) measure greater than >0.5. Each Variables: Enjoyment, Skill, Challenge, Telepresence, Avatar Identification, Avatar Customization, Avatar Attractiveness, flow, and Compulsive Buying shows KMO result subsequently of 0.839; 0.716; 0.822; 0.813; 0.854; 0.691; 0.693; 0.775, and 0.901 with Bartlett's test of sphericity (p-value < 0.001). All 9-Variables were extracted using principal component analysis resulting in one component extracted. Computing Cronbach's alpha in reliability analysis to measure internal consistency for all extracted factors, showing all the factor values higher than 0.8. Each Construct on Table 3. shows AVE higher than 0.5, composite reliability higher than 0.7, and all the instruments resulted in positive load and significantly onto the respective construct with value minimum of 0.533 to maximum of 0.923. The Proposed Theoretical model in this study is (1) Enjoyment, Skill, Challenge, Telepresence and Avatar Identification are positively related to flow; (2) Avatar Customization and Avatar Attractiveness are positively related to Avatar Identification; and (3) flow and Compulsive buying are positively Related. The Proposed theoretical model was tested using regression analysis in SPSS to evaluate the model.

Structural Model: Hypothesis Testing

Independent variables of Enjoyment, Skill, Challenge, Telepresence, and Avatar Identification regression analysis to dependent variables of flow resulting in a Model with R square of 0.5, Durbin-Watson value of 1.973, and p-value of <.001. Enjoyment, Skill, Challenge, Telepresence, and Avatar Identification showing value of coefficient of Beta subsequently, 0.093; 0.090; 0.139; 0.349; and 0.318. Enjoyment and Skill Variables are not supported with 95% confidence level because of showing significant level of 0.071 and 0.075, Although calculated significant if Confidence level of 90%. For other variables, Challenge, Telepresence and Avatar Identification, all shows the variables are supported with p-value of 0.04; <.001; and <.001.

The second model of predicting Avatar Identification as Dependent Variable with Avatar Attractiveness and Avatar Customization resulted in a model of R squared value of 0.261 and Durbin-Watson value of 1.824 with model p-value of <.001. Dependent Variables of Avatar Customization and Avatar Attractiveness Show Standardized Beta coefficients of 0.28 and 0.275, with both p-value <.001 which means both are supported.

As for the final model proposed, flow as a dependent variable to predict Compulsive Buying dependent variables resulted in Model of R square 0.265 and Durbin Watson value of 1.989 with Anova model p-value of <.001. Flow coefficient in the model showing standardized Beta of 0.515 with significant level of <.001.

Construct	Item Labeled	Item Description	Loading (> 0,5)	KMO (> 0.5)	Cronbach's alpha (>0.7)
Enjoyment	EJY01	Playing Mobile Legend is Fun	0.761	0.839	0.850
	EJY02	Playing Mobile Legends is pleasurable	0.808		
	EJY03	Playing Mobile Legends is enjoyable	0.804		
	EJY04	Playing Mobile Legends is exciting	0.775		
	EJY05	Playing Mobile Legends is interesting	0.813		
Skill	SKL01	When I play Mobile Legends, I feel that I am extremely skilled at playing Mobile Legends	0.768	0.716	0.818
	SKL02	When I play Mobile Legends, I feel that I have	0.805		
	SKL03	When I play Mobile Legends, I feel that my skill in playing Mobile Legends is superior to	0.819		
	SKL04	When I play Mobile Legends, I feel that I have a better understanding of Mobile Legends	0.861		
	SKL05	When I play Mobile Legends, I feel that I know how to find what I am looking for in	0.533		
Challenge	CHL01	I feel that playing Mobile Legends challenges me	0.827	0.822	0.904
	CHL02	I feel that playing Mobile Legends provides a good test of my skills	0.893		
	CHL03	I feel that playing Mobile Legends challenges me to master all elements of the game	0.834		
	CHL04	I feel that playing Mobile Legends challenges me to try everything that is possible to do in a game	0.839		
	CHL05	I find that playing Mobile Legends challenges me to the best of my ability	0.857		
Construct	Item Labeled	Item Description	Loading (> 0,5)	KMO (> 0.5)	Cronbach's alpha (>0.7)
Telepresence	TEL01	When I play Mobile Legends, I feel and think like as if I am the hero that I am currently playing	0.533	0.813	0.853
	TEL02	When I play Mobile Legends, I feel that my body is in the room, but my mind is in the Mobile Legends universe	0.838		

Table 3. Measurement Model, Loading, Construct Reliability and Convergent Validity.

	TEL03	Playing Mobile Legends often makes me forget where I am	0.855		
	TEL04	After playing Mobile Legends, I feel like have I come back to the "real world" after a journey	0.9		
	TEL05	I forget about my immediate surroundings when I play Mobile Legends	0.832		
Avatar Identification	AVI01	I have strong feelings of ownership toward my avatar	0.771	0.854	0.928
	AVI02	I feel that my avatar is an extended part of myself	0.883		
	AVI03	My avatar provides a kind of self-expression	0.847		
	AVI04	My avatar is extremely important to me	0.794		
Avatar Customization	AVC01	This online game enables me to customize the appearance of my hero	0.811	0.691	0.811
	AVC02	This online game enables me to choose "skin" for my hero	0.896		
	AVC03	This online game enables me to customize equipment, accessories and decorations of my hero	0.864		
Avatar Attractiveness	AVA01	The appearance of my avatar is good-looking	0.923	0.693	0.855
Tittueti veness	AVA02	The appearance of my avatar is attractive	0.88		
	AVA03	The appearance of my avatar is physically attractive	0.842		

Construct	Item Labeled	Item Description	Loading (> 0,5)	KMO (> 0.5)	Cronbach's alpha (>0.7)
Flow	FLO01	When I play Mobile Legends, I am absorbed intensely by it.	0.801	0.775	0.887
	FLO02	When I play Mobile Legends, I am deeply engrossed by it.	0.867		
	FLO03	When I play Mobile Legends, I am fully concentrated on it.	0.814		
	FLO04	When playing Mobile Legends, time seemed to pass very quickly	0.713		
	FLO05	When playing Mobile Legends, my attention is focused on the game	0.853		

	FLO06	When playing Mobile Legends, I am not aware of things happening around me	0.781		
Compulsive Buying	COB01	I often have an unexplainable urge, a sudden and spontaneous desire, to buy skins in Mobile Legends.	0.747	0.901	0.925
	COB02	I am often impulsively buy "skin" in Mobile Legends	0.831		
	COB03	For me, shopping "skin" in Mobile Legends is a way of facing the stress of my daily life and of relaxing.	0.832		
	COB04	I sometimes feel that something inside pushes me to buy "Skins" in Mobile Legends.	0.845		
	COB05	I buy "skin" that I don't need or won't use in Mobile Legends.	0.786		
	COB06	I go online buying binges on skin in Mobile Legends.	0.782		
	COB07	I feel "high" when I go on a buying spree in Mobile Legends.	0.849		
	COB08	I feel driven to shop and spend in Mobile Legends, even when I don't have the time or the money.	0.821		

Table 4. Correlation Matrix And Discriminant Validity											
Construct	Me an	SD	1	2	3	4	5	6	7	8	9
Enjoyment	6.01 8	0.8 01	0.792								
Skill	5.70 8	0.9 58	.494**	0.76 6							
Challenge	6.01 5	1.0 07	.380**	.350 **	0.85						
Telepresence	3.89 4	1.5 95	0.1058 6	.263 **	.269**	0.80 2					
Avatar Identificatio n	4.04 7	1.7 88	- 0.0630 3	.120 *	.172**	.753 **	0.82 5				
Avatar Customizati on	5.32 6	1.3 99	.138*	.276 **	.214**	.429 **	.471 **	0.85 7			
Avatar Attractivene	5.65 9	1.2 93	.179**	.248 **	.204**	.378 **	.469 **	.695 **	0.88 2		

SS											
Flow	5.06 4	1.3 91	.207**	.315 **	.355**	.660 **	.610 **	.436 **	.354 **	0.80 6	
Compulsive Buying	3.74 6	1.6 69	0.0505 31	.317 **	0.1047 25	.544 **	.489 **	.452 **	.451 **	.515 **	0.81 23

		Std	Std			
Hypothesis	Direct Effect	Beta	Error	t-Value	P-Value	Decision
H1	Enjoyment -> Flow	0.093	0.089	1.811	0.0712998	Supported*
H2	Skill -> Flow	0.090	0.073	1.787	0.0751364	Supported*
Н3	Challenge -> Flow	0.139	0.066	2.922	0.0037745	Supported**
H4	Telepresence -> Flow	0.349	0.059	5.189	0.0000004	Supported**
Н5	Avatar Attractiveness -> Avatar Identification	0.093	0.280	3.855	0.0001444	Supported**
	Avatar Customization -> Avatar					
H6	Identification	0.100	0.275	3.792	0.0001842	Supported**
H7	Avatar Identification -> Flow	0.318	0.051	4.846	0.0000021	Supported**
H8 Note(s	Flow -> Compulsive Buying ** Confidence Level 90% ** Confidence Level 95% and 99%	0.515	0.062	9.932	0.0000000	Supported**



Figure 1. Proposed Model: Research Framework

CONCLUSION

Theoretical Implications

The study conducted was to investigate the relationship between player behavior (i.e. enjoyment, skill, challenge, telepresence), avatar identification, and flow. Following that, an examination of flow's influence on user's compulsive buying behavior. The confidence level of 95% (p-value < 0.05) was used to evaluate the hypothesis.

As indicated in hypothesis testing, it was found that challenge and telepresence are positively affecting flow state. Hence, H3 and H4 are supported. It is known that challenge is one of the key components of flow state; meaningful challenges play a vital role in maintaining players' retention (Merikivi et al., 2017). The gameplay of Mobile Legends, which is a teambased Player vs Player (PvP), provides the challenge of beating other people to prove themselves. It is further supported by the ranking system that is used to determine a player's current skill level, the challenge of climbing the ranks has become one of the reasons competitive multiplayer games like Mobile Legends have become so popular in recent years. Telepresence has been studied as a high level of engagement, where players experience complete and genuine immersion during their gameplay session (Huang, 2006; Cuny et al., 2015; Ghazali et al., 2021). The vast selection of characters provided in Mobile Legends accommodates multiple types of people's preferences in the avatar they like to play. This increases the uptime of telepresence of players during the game.

In contrast, enjoyment and skill are not affecting flow state positively, which indicates that H1 and H2 are not supported. However, if the confidence level were to be reduced to 90%, H1 (p-value = 0.071) and H2 (0.075) are supported due to its significance (p-value < 0.1). It could be interpreted that the enjoyment and skill might still affect flow state even though they hold a lower level of significance compared to challenge and telepresence. However, the study conducted by Ghazali et al. (2021) indicated otherwise. In their research results, it was shown that enjoyment and skill significantly influence flow state, alongside challenge and telepresence. Possible causes of these different results might be credited to the skill level gap of players. In a competitive game environment, a jarring gap of skills between players might negatively impact their enjoyment (Kim et al., 2015). This applies both ways, lesser skilled players wouldn't be able to keep up with higher skilled players which reduce their enjoyment. As for higher skilled players, the gameplay would not provide enough engagement due to the difference in skill level. In the case of avatar identification, the results indicate that avatar attractiveness and avatar customization are positively related to avatar identification. Therefore, H5 and H6 are supported. According to Yee et al, 2009 Avatar Attractiveness constitutes how an avatar or character's ingame appearance. This study finding on Avatar Attractiveness resulted positively in relation to Avatar Identification which was positively related. In Mobile Legends it means, a player who has attractive skin or accessory used in the game resulted in more being recognized by other players. Avatar Customization is also found positively correlated to Avatar Identification supporting research conducted by Teng, 2010. Customization enhances the connection between the player and their avatar, even projecting themselves into their avatar. Customizing their avatar is easier than themselves to their ideal and leads to which Hoffner and Buchanan (2005) and Von Feilirzen and Linnie (1975) proposed the term wishful identification.

As for its relation to flow state, it was indicated that avatar identification positively influences flow state, therefore H7 is supported. In a study conducted by Ghazali et al, 2021, independent variables to flow are limited to Enjoyment, Skill, Challenge, and Telepresence. In another study by Liao et al, 2017 they found Avatar Identification related positively to flow. In

this study, we found that flow is positively related not only to player behavior such as Enjoyment, Skill, Telepresence and Challenge of the game, therefore, Social Identity in a form of Avatar Identification as mentioned by Liao et al, 2017 play a role in the flow of gamer in their experience while gaming. We found that the coefficient of Standardized Beta in Avatar Identification is the second largest before Telepresence. This finding supported research on Li and Lwin, 2016 that players become emotionally connected with avatar experience, in which Mobile Games players improve their avatar on purchasing skin and accessories in the game overtime accumulation of resources and experience through heroes used and skin purchased lead to emotional connection.

Lastly, the results also indicate that flow state does influence compulsive buying positively. Hence, H8 is supported. Based on the study of Mason et al. (2022), it is indicated that flow states positively influence online compulsive buying. Furthermore, the study of Zhou et al. (2010), Kim and Han (2014), and Ettis (2017) also indicate that flow is one of the influential factors in user's behavior online. High level of flow is related to high number of purchases, satisfaction, loyalty, and longer hours spent, which is showcased in the demographic data obtained through the survey conducted in this study. Flow state also hinders users to think before they act, promoting impulsive actions which is a common trait among compulsive buyers (Dittmar et al., 2007). Furthermore, as it is generally a positive feeling, players would want to experience flow multiple times, further supporting the tendency of compulsive behavior. References

Limitations and Future Research

Despite the interesting theoretical findings of this investigation, few limitations also become visible. Plenty of opportunities to conduct additional studies and suggestions since a few restrictions impede the current study. (Al Halbusi & Tehseen, 2017). Because of this, future advancement should come from additional research. Initially, a convenience sampling was used in this study and the questionnaire was sent online. All of the information was gathered from respondents that live in Indonesia, especially West Java (37.45%) and Central Java (21.82%) are the 2 regions that have the most respondents. Meanwhile, for the coverage of ages 17 to 22 with 50.91% and 23 to 28 getting 47.27% leaving ages 29 to 34 with the smallest percentage of 1.82%. As a result, the study sample that was used did not accurately represent the demographics of the worldwide Mobile Legends gamers. The sample data used in the future study should more accurately reflect the global Mobile Legends gamers. The method using questionnaires must be distributed through more various platforms and not only using online questionnaires. Communities and demographic players are still growing therefore channels for questionnaire distribution are limited. Surveys on Mobile Legends players can also be carried out by interview so that the data obtained can be more accurate and detailed. Further research might be carried out by looking for even more specific data such as player spending in one gacha or what factors make them want to get the skin even though they have to spend quite a lot of money.

Avatar customization studies may help developers to design their avatar based on gender, height, and ages (Ratan and Sah, 2015). According to Tinwell et al,(2011), attributes of avatar design elements may have an impact on avatar attractiveness and customization. Correlations between avatar attractiveness and avatar customization should be included based on the effects. Future studies may include the preferences of avatar customization to generate specific characteristics that will give game providers knowledge and new perspective. Game are designed to provide players with achievable goals that progressively ramp up in difficulty, keeping them

engaged and motivated. Correlation between this stimulus such as skill and challenge, might affect each other significantly. Future studies should include effects that are generated among the stimulus effects.

Managerial Implications

These results show that avatar modification and attractiveness are connected to avatar identification. These elements may inspire players to establish ties with their avatars through their participation in the game. By enabling this function, game designers can create excellent flow states that encourage user loyalty.

Conclusion

In this study, the essential element of compulsive buying in Mobile Legends virtual ingame items were investigated. Factors (challenge, telepresence, avatar identification, and flow) affect the compulsive buying behavior of the users. Telepresence and avatar identification holds the most significance in influencing users' flow state. It could be interpreted that both of these factors (S) indirectly positively influence compulsive buying (R), as seen in their standard beta value (Telepresence = 0.349, Avatar Identification = 0.318). Avatar attractiveness and avatar customization are supporting avatar identification significantly. Furthermore, flow state significantly influences users' compulsive buying behavior. Meanwhile, enjoyment and skill do not influence users' flow state significantly, hence their relationships are not supported.

REFERENCES

- Ajzen, I. (1991, December). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211. <u>https://doi.org/10.1016/0749-5978(91)90020-t</u>
- Al Mawalia, K. (2020). The impact of the Mobile Legend game in creating virtual reality. Indonesian Journal of Social Sciences, 12(2), 49-61.
- AppMagic. (August 2, 2023). Most popular MOBA gaming apps worldwide in July 2023, by downloads [Graph]. In Statista. Retrieved August 08, 2023, from <u>https://www-statista-com.upm.remotlog.com/statistics/1269466/most-downloaded-moba-apps-worldwide/</u>
- Bae, J., Park, J., Choi, J., Soh, S. B. (2023). A recommending system for mobile games using the dynamic nonparametric model. Journal of Business Research, volume 167.
- Faber, Richard J., & O'Guinn, Thomas C. (1989). The Relationship Between Impulsivity and Compulsive Buying. The Journal of Consumer Research.
- Gartenberg, Chaim (May 3, 2017). Retrieved August 9, 2023 from https://www.theverge.com/2017/5/2/15517962/china-new-law-dota-league-of-legendsodds-loot-box-random
- Ghazali, E. M., Al Halbussi, H., Fattah, F. A. M. A., Uzir, Md U. H., Mutum, D. S., Tan, F. (2021). A study of player behavior and motivation to purchase Dota 2 virtual in game items. Kybernetes, volume 52, no. 6. doi: 10.1108/K-08-2021-0678.
- Hoffner, C. and Buchanan, M. (2005). Young adults' wishful identification with television characters: the role of perceived similarity and character attributes. Media Psychology, volume 7 No. 4, 325-351.
- Kim, C., Lee, S.G. and Kang, M. (2012). I became an attractive person in the virtual world: users' identification with virtual communities and avatars. Computers in Human Behavior, volume 28 No. 5, 1663-1669.

- Kim, E., Kim, Y., & Kim, H. (2015). The impact of skill gap on enjoyment in online multiplayer games. Computers in Human Behavior, 49, 85-93.
- Kim, K., Schmierbach, M. G., Bellur, S. (Saras), Chung, M.-Y., Fraustino, J. D., Dardis, F., & Ahern, L. (2015). Is it a sense of autonomy, control, or attachment? Exploring the effects of in-game customization on game enjoyment. Computers in Human Behavior, 48, 695– 705. doi:10.1016/j.chb.2015.02.011
- Liao, G., Cheng, T. C. E., Teng, C. (2018). How do avatar attractiveness and customization impact online gamers' flow and loyalty?. Internet Research, volume 29, no. 2. doi: 10.1108/IntR-11-2017-0463
- Lo, S.K., Lie, T. and Li, C.L. (2016). The relationship between online game playing motivation and selection of online game characters the case of Taiwan. Behaviour and Information Technology, volume. 35 No. 1, 57-67.
- Mason, M. C., Zamporo, G., Marini, A., Ameen, N. (2022). Glued to your phone? Generation Z's smartphone addiction and online compulsive buying. Computers in Human Behavior, volume 136. Doi: 10.1016/j.chb.2022.107404
- Mehrabian, A., & Russell, J. A. (1974). An approach to environmental psychology. The MIT Press.
- Ming, J., Jianqiu, Z., Bilal, M., Akram, U. and Fan, M. (2021), How social presence influences impulse buying behavior in live streaming commerce? The role of S-O-R theory. International Journal of Web Information Systems, volume 17 No. 4, 300-320.
- Shibuya, A., Teramoto, M., & Shoun, A. (2016). In-Game Purchases and Event Features of Mobile Social Games in Japan. Transnational Contexts of Development History, Sociality, and Society of Play, 95–122. doi:10.1007/978-3-319-43820-7_4
- Shimbun, Yomiuri (May 29, 2012). Retrieved August 9, 2023 from https://ameblo.jp/srachai/entry-11265092066.html
- Tajfel, H. and Turner, J.C. (1986). The social identity theory of intergroup behavior. In Worchel, S. and Austin, W.G. (Eds), The Psychology of Intergroup Relations, Nelson-Hall, Chicago, IL, 7-24.
- Tang, Z. and He, B. (2021). Explaining mobile game takeoff through information configuration. Industrial Management & Data Systems, volume 121 No. 12, 2411-2425.
- Teng, C. (2017). Impact of avatar identification on online gamer loyalty: Perspectives of social identity and social capital theories. International Journal of Information Management, Volume 37, Issue 6, Pages 601-610.
- Teng, C.I. (2010). Customization, immersion satisfaction, and online gamer loyalty. Computers in Human Behavior, volume 26 No. 6, 1547-1554.
- Wang, L., Luo, X., Li, H. (2022). Envy or conformity? An empirical investigation of peer influence on the purchase of non-functional items in mobile free-to-play games. Journal of Business Research, volume 147, 308-324.
- Wired (May 12, 2012). Retrieved August 9, 2023 from <u>https://www.wired.com/2012/05/gacha-watch-japan-social-games/</u>
- Zenpop (March 23, 2023), retrieved August 9, 2023 from https://zenpop.jp/en/blog/post/5346/the-ultimate-guide-togachapon#:~:text=To% 20use% 20a% 20gachapon% 20machine, highly% 20sought% 20after % 20by% 20collectors.