Understanding Continuance Intention In Multiplayer Online Battle Arena Games In Yogyakarta: Game Design, Social Factor, Perceived Ease Of Use, And Perceived Of Enjoyment

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Abstract: The development of technology brings a huge change in many aspects including in digital game or mobile games. In Indonesia, one of the most played mobile game genres is MOBA games or strategy video games where there are two teams or more of players competing against each other in battlefield given. The study aims to analyze the effect of game design, social factor, and perceived ease of use on perceived enjoyment and perceived enjoyment towards continuance intention. The population of this study is 150 gamers who are playing MOBA in Yogyakarta. The result shows that game design, social factor, and perceived ease of use have a positive and significant effect on perceived enjoyment. Moreover, the result also depicts that perceived enjoyment plays significant role towards continuance intention to play MOBA.

Keywords: Multiplayer Online Battle Arena Games; Continuance Intention; Game Design; Social Factor; Perceived Ease of Use; Perceived Enjoyment

I. INTRODUCTION

The development of technology carries a lot of changes for human's life in many aspects including rapid advance in digital game especially mobile games. Mobile game is a form of an application that is played in small device (Pantouw & Aruan, 2019). It is, therefore, easy to carry and play anywhere. Mobile games also represent 51% of global digital game market from year to year (Purnami & Agus, 2021). Many games have been designed and developed along with various improvements and innovations. A person who like playing a game is called a gamer (https://dictionary.cambridge.org, 2023). A gamer does not play game only based on user interface alone but also based on other elements such as entertainment experienced, several types of human-to-human interactions, and easiness to play it (Chang et al, 2014).

Southeast Asia is the fastest growing market for mobile games with \$2.6 billion revenue (Purnami & Agus, 2021). Indonesia has become one of the most influential countries in term of online game downloading. It was said that the number

of game application installations in Indonesia achieved three times higher than the other countries such as United States, Mexico and India (Akbar et al, 2018). There were 3.45 billion of downloading in 2022 which has been increasing about 320 million users since 2021 (data.ai, 2023). Besides, in December 2022, Indonesian gamers spent more or less \$7.5 million and 410.28 million hours spent on mobile games.

Among the various mobile games' genres, one of the most played mobile game genres in Indonesia is action multiplayer online battle arena or MOBA games (data.ai, 2023). MOBA games, originated from a modified version of real-time strategy, are classified as one of popular types of game which incorporated cooperative and also competitive elements (T'ng et al, 2022). It is also defined as strategy video games where there are two teams or more of players competing against each other in battlefield given (Paz and Nocon, 2021). The goal of the game is to destroy main structure or main base of the opponent. The popular MOBA gaming apps in Indonesia include Mobile Legends: Bang Bang, Pokemon UNITE, Leagues of Legends, Marvel Super War, and Arena of Valor.

MOBA games adopted the freemium business model which the gaming companies offer their basic products for free and gain revenue or profit from the sale of value-added-ingame items (Wang et al, 2022). For example, Mobile Legends becomes one of games with the total of 703 million hours spent in 2022. The number of gamers were also achieving more than 100 million people in 2020 and became number one gamer in Southeast Asia (Marcelino & Rafdinal, 2021). However, it is said to be difficult to obtain and maintain the loyalty of users of particular game. Despite the fact that MOBA game industry has a huge potential in market, with a large number of alternative products, players can easily jump from one game into another game resulting competitions among gaming companies and developers (Kang et al. 2020). Therefore, the developers of games need to find out elements that capture the gamers' continuance intention to gain loyalty especially in Indonesia.

There are several studies which investigate gamers' continuance intention in mobile games although they are very limited. The first study, done by Rizkiyani & Gunawan (2023), who investigate factors that influenced gamers' loyalty, especially in Mobile Legends' users. It was stated that some factors influenced gamers' loyalty including telecommunication operator, product features, price and game design. The second study was conducted by Yang & Lin (2019). The study analyzed variables that influenced continuance to play mobile game application. The variables included perceived ease of use, social influence, perceived convenience, perceived playfulness, and flow experience. The research was done in Taiwan among 377 valid respondents. The last study came from Nguyen (2015) whose research entitled Understanding Perceived Enjoyment and Continuance *Intention in Mobile Game.* The research found the relationship among various constructs and continuance intention in playing mobile game in some countries including USA, Finland, The UK, Canada, New Zealand, Vietnam and other countries.

The difference between this study and previous studies are that it inspects the effect of game design, social factor, perceived ease of use, and perceived of enjoyment towards continuance in playing mobile game especially in Multiplayer Online Battle Arena (MOBA) games. To be more specific, the study was conducted among players in Yogyakarta, one of cities in Indonesia or part of the largest users of gamers in Southeast Asia (Ericska et al, 2022).

II. LITERATURE REVIEW

A. GAME DESIGN

Game design is defined as an art that brings and actualize a real life into a game (Rizkiyani, A., & Gunawan, I. D, 2023). It needs special treatment to embody a good design in a mobile game. A gaming developer sometimes hire professionals to develop the game design. They do not only create the game story but also create characters, setting, gameplay, setting, user interface, and many more.

There are three attributes in game design (Gultom et al, 2020). The first one is Challenge. Challenge is a construction in the games model which defined as sense of ability of a

person who is being tested. The second is variety and novelty. When playing a game, a gamer will be more familiar with the game stimulating content which decreases the stimulation level and makes a gamer lose their interest in playing the game (Merikivi & Nguyen, 2017). Variety and novelty are related to each other. A gamer needs to perceive something surprising and different from previous one. The last is design aesthetic, which is related to the balance, emotional appeal and esthetics of a mobile game. It is very vital to note the aesthetic value and quality of design in game design due to its effect towards the satisfaction of players' psychological needs (Razali et al, 2022)

B. SOCIAL FACTOR

Generally, online game provides facilities for gamers to interact to each other. Players in mobile game are able to interact with other players such as mostly friends, families, or other intimates (Chatterjee, 2021). Besides, social interaction enables among gamers to make new friends (Blinka & Mikuška, 2014). Social interaction also teaches gamer to be dependent on other gamers in game to strengthen their relationship, provide good understanding of teamwork as well (Stenros et al, 2011). Moreover, interaction in mobile game also facilitates gamers with a certain identity. Some gamers register with their real name so that their friends can find them more easily while some do not use their real name or to keep anonymous (Chen, 2016).

C. PERCEIVED EASE OF USE

Perceived ease of use can be defined as the degree which people believe that by using certain system makes them free of effort (Gupta et al, 2021). Bassiouni et al (2019) explains ease of use plays vital role in technology usage. In mobile game, a developer must pay attention to easiness for gamers to play the games such as the operation, gameplay and interaction facility among players. It also assesses the level of complexity to use and understand a hedonic technology. The measurement of perceived ease of use in online game can be seen as practical, easy to play or use, and also easy to understand (Basuki et al, 2022).

D. PERCEIVED ENJOYMENT

Perceived enjoyment in mobile game can be defined as the expectation to derive pleasure, fun, and also joy in playing mobile game (Chinomona, 2013). It is also related to positive impression given to gamers so they can feel comfortable and positive (Almaudina, 2023). It means, when the gamers are playing mobile game, they expect to perceive a feeling of comfort, happiness, and elation as well. Besides, perceived enjoyment can be interpreted as when someone feels enjoyable in doing certain activity (Xiang et al, 2015). At the end, gamers who enjoy playing games will create favorable sentiments and it increases loyalty and encourage them to continue playing the game (Alexander and Hidayat, 2022).

E. CONTINUANCE INTENTION

Continuance intention is described as someone's psychological intention to do something on a consistent basis (Li, 2023). In mobile game, players are more likely to continue to play the game if the players have the optimal experience during playing the game (Li & Kitcharoen, 2022). When players are loyal to play a certain mobile game, it gives lots of benefits for the gaming companies such as retaining their maket share and increasing their revenue as well (Tharaka & Hettiarachchi, 2022). Therefore, it is very essential for gaming companies or developers to understand what drives and makes players' continuance intention towards online games (Ashfaq, 2022).

Moreover, the research model is presented in figure 1.

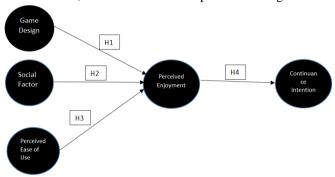


Figure 1: Research Model

From the research model stated, four research hypotheses were developed:

- H1: Game Design positively affects players' Perceived Enjoyment in playing mobile game in Yogyakarta
- H2: Social Factor positively affects players' Perceived Enjoyment in playing mobile game in Yogyakarta
- H3: Perceived Ease of Use positively affects players' Perceived Enjoyment in playing mobile game in Yogyakarta
- H4: Perceived Enjoyment positively affects players' Continuance Intention in playing mobile game in Yogyakarta

III. RESEARCH METHODS

The research uses Structural Equation Model (SEM) technique to determine the measurement and structural models. There are two types of SEM, the first one is SEMbased covariance or Covariance-based Structural Equation Modelling (CBSEM). The second one is known as Square path Modelling or PLS-SEM. PLS-SEM is inclined to be a prediction with a variance-based approach as it is used to analyze the data collected. The tool to collect data in the research used questionnaire with a likert scale. The data were collected in August 2023 in Yogyakarta. The sampling technique used was purposive random sampling. The number of respondents are 150 respondents who are classified as gamers and have been playing MOBA games for at least 6 months. The questionnaire consists of two parts. The first one is general information and the second one is questions to test the research model shown previously.

IV. RESEARCH RESULT

A. RESPONDENT PROFILE

The research analyzed the data of 100 respondents. The participation ratio of male is 71 respondents and the majority of respondents are undergraduate students between 20 up to 30 years. Furthermore, most respondents have been playing mobile games for more than 3 years.

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Description	Classification	Frequency		
C 1	Male	71		
Gender	Female	29		
	<20 years	24		
Age	20 – 30 years	73		
	>30 years	3		
	Diploma	8		
Current Level of	Undergraduate	88		
Education	Degree			
	Postgraduate Degree	4		
Period of Time Playing Mobile Game	<1 year (More than	19		
	6 months)			
	1-3 years	24		
	>3 years	57		

Table 1: Profile of Respondents

B. CONVERGENT VALIDITY, DISCRIMINANT VALIDITY, AND CONSTRUCT RELIABILITY & VALIDITY

All constructs were processed to analyze the value of convergent validity, construct reliability & validity. The outcome of convergent validity is represented as follows:

Variable	Indicator	Outer Loadings
Game Design	GD1	0.858
	GD2	0.901
	GD3	0.905
	GD4	0.917
	GD5	0.926
Social Factor	SF1	0.860
	SF2	0.828
	SF3	0.822
	SF4	0.735
	SF5	0.858
	SF6	0.861
Perceived Ease of Use	PEU1	0.922
	PEU2	0.832
	PEU3	0.902
	PEU4	0.923
	PEU5	0.877
Perceived Enjoyment	PE1	0.929
	PE2	0.863

	PE3	0.899
	PE4	0.941
	PE5	0.913
Coninuance Intention	CI1	0.780
	CI2	0.884
	CI3	0.854
	CI4	0.831
	CI5	0.835

Table 2: Goodness of Fit Results

The results in Table 2 show all constructs already met minimum requirement which is ≥ 0.70 (Hair et al., 2021 and Musyaffi et al., 2022). Morevover, discriminant validity was assessed by analyzing the loading value of the construct. Each loading value must be greater than all the loadings in the other constructs (Kamis et al., 2020). Based on the result in table 3, all indicator's loading is higher than the loadings of the indicators of its related variable (Mohd Thas Thaker et al., 2021)

,	Continuance Intention	Game Design	Perceived Ease of Use	Perceived Enjoyment	Social Factor
ci1	0.780	0.612	0.656	0.618	0.548
ci2	0.884	0.631	0.595	0.636	0.442
ci3	0.854	0.571	0.538	0.607	0.481
ci4	0.831	0.522	0.474	0.629	0.523
ci5	0.835	0.554	0.512	0.598	0.459
gd1	0.717	0.858	0.772	0.780	0.693
gd2	0.595	0.901	0.716	0.781	0.786
gd3	0.594	0.905	0.717	0.702	0.683
gd4	0.565	0.917	0.682	0.772	0.695
gd5	0.639	0.926	0.737	0.796	0.687
pe1	0.670	0.809	0.773	0.929	0.767
pe2	0.672	0.689	0.761	0.863	0.670
pe3	0.658	0.778	0.767	0.899	0.773
pe4	0.681	0.799	0.804	0.941	0.782
pe5	0.676	0.794	0.747	0.913	0.724
peu1	0.616	0.716	0.922	0.819	0.706
peu2	0.569	0.701	0.832	0.739	0.787
peu3	0.606	0.696	0.902	0.718	0.644
peu4	0.617	0.768	0.923	0.788	0.727
peu5	0.546	0.705	0.877	0.703	0.634
sf1	0.402	0.665	0.613	0.637	0.864
sf2	0.422	0.660	0.679	0.670	0.834
sf3	0.425	0.753	0.714	0.760	0.831
sf4	0.453	0.479	0.493	0.546	0.729
sf5	0.585	0.645	0.685	0.707	0.852
sf6	0.597	0.687	0.691	0.720	0.855

Table 3: Cross Loadings

Reliability test is done to analyze the consistency of the instrument (Yaacob et al., 2021). The analyses are including Cronbach's Alpha, Loadings, Average Variance Extracted or AVE, and Composite Reliability. The result is presented in table 4.

Construct	Items	Loadings	Cronbach's Alpha	Composite Reliability	Average, Variance, Extracted (AVE)
	gd1	0.858			
	gd2	0.901		0.943	0.813
Game	gd3	0.905	0.942		
Design	gd4	0.917			
	gd5	0.926			
	sf1	0.864		0.914	0.687
	sf2	0.834			
Social	sf3	0.831	0.908		
Factor	sf4	0.729	0.908		
ractor	sf5	0.852			
	sf6	0.855			
	peu1	0.922		0.938	0.796
	peu2	0.832	0.935		
Perceived	peu3	0.902			
Ease of Use	peu4	0.923			
	peu5	0.877			
	pe1	0.929		0.948	0.827
	pe2	0.863			
Perceived	pe3	0.899	0.948		
Enjoyment	pe4	0.941			
	pe5	0.913			
Continuance	ci1	0.780		0.893	0.701
	ci2	0.884			
Intention	ci3	0.854	0.893		
menuon	ci4	0.831			
	ci5	0.835			

Table 4: Construct Reliability & Validity

C. COEFFICIENT OF DETERMINATION (R2) AND MODEL FIT

The coefficient of determination is used to analyze how good regression predictions fit the data. It also aims to examine the predictive capabilities of model and the relationships between constructs (Aburumman et al., 2022). R2 can be measured to check the coefficient of determination and the level of significance of the path coefficients. There are three 3 classifications to assess R2, If the value of R2 is 0.67, the model is considered substance or strong. When the value of R2 is 0.33, the model is moderate. When the value of R2 achieves 0.19, the model is weak (Kurniasih et al., 2022). Based on table 5, the values depict substantial and moderate results. Standardized Root Mean Square Residual (SRMR) is also used to indicate the goodness of fit of the research model. Loan et al (2023) states that a suitable model has an SRMR value of less than 0.08. The result is in table 6.

Variable	R Square	R Square Adjusted		
Continuance	0.545	0.541		
Intention				
Perceived	0.818	0.813		
Enjoyment				
Source: SmartPLS Processed Data				

Table 5: R-square of the Endogenous Latent Variables

	Saturated Model	Estimated Model	
SRMR	0.065	0.066	

Table 6: Standardized Root Mean Square Residual (SRMR)

V. MODEL EVALUATION

Hypothesis testing is done to confirm the significance value and to test the relationship between constructs if they have significant effect. To observe the significance, T-Statistics and P-Values are analyzed. The minimum requirement of T-Statistics must be more than 1.96 and P-Value must be less than 0.05 (Hair et al., 2021). Table 7 shows all hypotheses meet the minimum requirements.

Hypothesis	Original Sample (O)	T-Statistics	P-Values	
Hypothesis 1	0.373	4.144	0.000	
Hypothesis 2	0.247	2.245	0.025	
Hypothesis 3	0.353	3.041	0.002	
Hypothesis 4	0.738	14.686	0.000	
Source: SmartPLS Processed Data				

Table 7: Model Hypothesis Testing

VI. DISCUSSION AND CONCLUSION

A. EFFECT OF GAMES DESIGN ON PERCEIVED ENJOYMENT

In this analysis, we will critically examine the relationship between game design and perceived enjoyment, discussing key factors and their implications. Game mechanics play a fundamental role in shaping a player's experience. Welldesigned mechanics can create a sense of challenge, mastery, and immersion, which are often associated with enjoyment. Mechanics that are intuitive and easy to grasp can contribute to perceived enjoyment, as players are more likely to feel in control and capable of achieving their goals. The balance between difficulty and player skill is crucial. If a game is too easy or too difficult, it can lead to frustration or boredom, negatively impacting enjoyment. Visual and auditory elements, including graphics, sound design, and music, significantly affect the atmosphere and immersion in a game. High-quality aesthetics can enhance the overall experience and increase enjoyment. The consistency of a game's art style with its narrative and mechanics can contribute to a more coherent and enjoyable experience. Aesthetics can also evoke emotions and create a connection between players and the game world, increasing engagement and enjoyment. A user-friendly interface and intuitive controls are crucial for a positive gaming experience. Frustrating or confusing user interfaces can lead to player frustration and decreased enjoyment. The absence of technical issues, such as bugs and crashes, is essential to maintain a player's immersion and overall enjoyment.

The relationship between game design and perceived enjoyment is multifaceted and influenced by numerous factors. Effective game design requires a balance between mechanics, aesthetics, and user experience. Iterative design processes are essential for refining and optimizing the impact of game design on perceived enjoyment.

B. EFFECT OF SOCIAL FACTOR ON PERCEIVED ENJOYMENT

The effect of social factors on perceived enjoyment is a crucial and often understated aspect of various activities, including gaming, social events, and leisure experiences. Social factors can significantly impact how individuals perceive and enjoy such activities. In this analysis, we will critically examine the relationship between social factors and perceived enjoyment, discussing key factors and their implications. One of the most significant social factors influencing perceived enjoyment is social interaction. Whether in multiplayer video games, board games, or team sports, interacting with others can enhance enjoyment. Social interactions provide a sense of connection, shared experiences, and emotional engagement. Collaboration, competition, and communication with others often amplify the pleasure derived from an activity. In competitive settings, such as e-sports or multiplayer games, the presence of opponents and the challenge they pose can intensify enjoyment. Competing against skilled players can create a sense of achievement when winning and motivation to improve when losing. Social bonds and camaraderie among players, particularly in team-based games. This social aspect contributes to the overall enjoyment of the game. Collaborative gameplay, where players work together to achieve common goals, can foster a sense of teamwork, trust, and shared accomplishment. Cooperative play often leads to high levels of enjoyment due to the positive social dynamics involved. Successful cooperative experiences can lead to long-lasting friendships and social networks built around the shared enjoyment of the activity. Being part of a supportive and inclusive social community can enhance the enjoyment of an activity. Communities, such as gaming clans or social clubs, offer a sense of belonging and acceptance, fostering a positive environment. The social context and setting in which an activity takes place can influence perceived enjoyment. For instance, playing a video game with friends in a relaxed, comfortable environment can be more enjoyable than playing alone in a stressful environment.

In summary, social factors have a profound impact on perceived enjoyment in various activities. The quality of social interactions, the support and community surrounding an activity all contribute to the overall experience. Recognizing and optimizing these social factors can enhance the enjoyment of an activity and create more positive and memorable experiences for participants. It's essential for individuals and designers to be aware of these dynamics and adapt their approach to maximize the benefits of social factors on perceived enjoyment.

D. EFFECT OF PERCEIVED EASE OF USE ON PERCEIVED ENJOYMENT

The relationship between perceived ease of use and perceived enjoyment is a crucial concept in the fields of user experience, human-computer interaction, and product design. The idea is rooted in the Technology Acceptance Model (TAM), which posits that the perceived ease of use of a system or product affects a user's attitude toward it and ultimately influences their intention to use it. In the context of

this analysis, we will critically examine how perceived ease of use impacts perceived enjoyment, and why this relationship is important. Perceived ease of use refers to the user's perception of how straightforward it is to use a product or system. It involves the perceived simplicity of learning how to use it, navigating through its features, and performing tasks efficiently. When a product is perceived as easy to use, it reduces cognitive and physical efforts required, thus making the interaction with the product more straightforward and less frustrating. Perceived enjoyment, in this context, refers to the user's emotional and hedonic response to using a product or system. It is linked to the pleasure and satisfaction derived from the interaction with the product. Enjoyment can encompass various aspects, including the aesthetic appeal, engagement, and the overall positive feelings the user experiences during and after using the product. A product that is perceived as easy to use typically results in lower cognitive load for users. Users don't have to invest as much mental effort in understanding how to use the product, which allows them to focus on their primary tasks. Reduced cognitive load can lead to a smoother and more enjoyable user experience, as users are less likely to experience frustration or cognitive overload. When a product is easy to use, users can complete tasks more quickly and efficiently. This efficiency can lead to a sense of accomplishment and satisfaction, which contributes to perceived enjoyment. Faster task completion can be particularly important in productivity software or applications where users want to accomplish tasks with minimal effort. Perceived ease of use can encourage users to explore more features and functions of a product, leading to increased engagement and interaction. Users may be more willing to experiment and discover new aspects of the product when they find it easy to use. Enhanced engagement often correlates with greater enjoyment, as users find the product more entertaining and interesting. A product that is perceived as easy to use is less likely to cause user frustration due to difficulties or obstacles in the interaction process. Reducing frustration is crucial for enhancing enjoyment. Users are more likely to have a positive emotional response when they are not constantly struggling with the product's usability. Perceived ease of use can lead to positive emotional associations with the product. Users may associate the product with a sense of convenience and user-friendliness, which can boost their overall satisfaction and enjoyment. In the long term, products that are perceived as easy to use are more likely to retain users. As users continue to use the product and become more familiar with it, their perceived enjoyment can increase. User retention is not only valuable for product developers but also contributes to the user's overall enjoyment as they gain more experience and expertise with the product. designers and developers should prioritize usability and ease of use to enhance user enjoyment and satisfaction.

E. EFFECT OF PERCEIVED OF ENJOYMENT ON CONTINUANCE INTENTION

Perceived enjoyment in the context of online battle arena games refers to a player's subjective assessment of the level of pleasure, satisfaction, and enjoyment derived from playing the game. The core gameplay mechanics, such as combat,

strategy, and competition, significantly affect perceived enjoyment. A well-designed and engaging gameplay experience enhances enjoyment. Some online battle arena games incorporate narratives or story elements. A compelling storyline or lore can add depth and enjoyment to the gaming experience. Games that provide a sense of accomplishment through leveling up, unlocking rewards, and achieving ingame goals can increase enjoyment. Many players find enjoyment in overcoming challenges, whether against AI opponents or human players. The level of competitiveness and the feeling of accomplishment contribute to enjoyment. Perceived enjoyment is closely linked to overall player satisfaction. Satisfied players are more likely to continue playing the game. Players who derive high enjoyment from a game may develop emotional attachment to it. This attachment can be a significant driver of continuance intention. High levels of enjoyment contribute to player engagement and retention. Players who have fun are more likely to stay engaged with the game over time. Perceived enjoyment can lead to long-term player loyalty. Players who consistently have fun are more likely to continue playing the game over an extended period.

Perceived enjoyment is a pivotal factor influencing the continuance intention to play online battle arena games. Games that prioritize enjoyable gameplay and engaging storytelling are more likely to retain players and foster a loyal gaming community.

VII. RECOMMENDATION FOR FURTHER RESEARCH

The research is expected to develop in the future due to a lot of information, games, and futuristic updates from game developers. The number of MOBA is also increasing as the type of game is still popular among the gamers especially in Indonesia. Some games were also conducting game tournament to increase awareness and loyalty. Furthermore, some developers also provide free gifts to those who are playing for the first time and also those who are loyal gamers. They also advertised in many platforms especially popular social media like TikTok, Instagram, Youtube, and Facebook. There are lots of famous gamers or content creators who are paid to promote the games as well to attract new customers or to promote new patches or game updates to maintain loyalty. Based on these facts, it is also important to analyze more variables regarding continuance intention to play MOBA. Does the advertisement affect it? Does the contents from famous content creators affect it? Or do famous and popular social media like TikTok, Youtube, Instagram, and Facebook become effective way and medium to promote loyalty? The questions as mentioned can be further or future research references.

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