Analysis of Gamification Implementation on the Marketplace: Testing the Effect of User Feedback on the Marketplace Using Self Determination Theory and Technology Acceptance Models

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ABSTRACT

The development of the marketplace produces a variety of features to attract users to engage with content. Gamification is one of the marketing tools that is currently trending and many are already using it, one of which is the marketplace. The purpose of this study is to examine the impact of the application of gamification in the marketplace on the effect of marketplace user feedback. The marketplaces used in this research are Shopee and Tokopedia. This study uses a quantitative method using the self determination theory model combined with the technology acceptance model. The results of the questionnaire data collection from 252 data contained 208 valid data. The results of data processing using SmartPLS produced four indicators with values below 0.7 including A1, A5, PEU4, and C5, so modifications were made to the research model. Based on the results of data processing, all of the hypotheses of this study were significant or accepted as many as 9 hypotheses. The results show that user attitudes greatly determine the sustainability of users towards the use of the marketplace and the pleasure of users when playing games on the marketplace is one of the main factors in determining user attitudes towards the marketplace. This study provides recommendations that related parties in making game features on the marketplace focus more on user enjoyment when playing games, because user pleasure is one of the main factors in determining user attitudes and user attitudes towards game features on the marketplace encourage users' intentions to use the marketplace.

1 Introduction

Various marketplaces have now developed and dominated the Indonesian online market. Marketplace is usually also called the sharing economy (Mozahem, 2021). Marketplace acts as a supporting institution for online transactions between sellers and buyers who may not have had previous interactions (Lu et al., 2016). The development of the marketplace has resulted in various features in it to attract users to engage with the content. Basically, consumers are more interested in using active rather than passive interactions such as the use of gamification which can lead to special interactivity characteristics between users (Yang et al., 2017).

Many previous studies have tested the impact of using gamification (Kim & Drumwright, 2016; Mitchell et al., 2017; Yang et al., 2017). Yang et al. (2017) in his research found that the usefulness of gamification can affect the user's intention to engage in the branding process, but the perceived social influence is not related to the user's intention to engage, but is related to the attitude towards the brand. Previous research conducted by Aparicio et al. (2021) also show that e-commerce websites that use gamification affect repurchase intentions in the context of e-commerce.

Research related to the impact of gamification was also conducted by Jahn et al. (2021) examined the impact of gamification on effective design elements using an avatar design on the effect of user feedback on re-use intention based on three psychological needs proposed by self-determination

theory (SDT). SDT is an empirically based theory of human motivation, which states that competence, autonomy, and relatedness influence behavior change (Stephens et al., 2021). Tobon et al. (2020) argues that the use of SDT and TAM methods are the two most common theoretical explanations used in research related to the effect of gamification. TAM is one of the most cited theories for predicting technology acceptance, and has been adopted by many theoretical studies (Vanduhe et al., 2020).

Research related to the use of SDT and TAM methods was also carried out by Aguiar-Castillo et al. (2020) to find out the social and hedonic aspects in game applications using the concept of gamification in the field of education. Equivalent to research (Roca & Gagné, 2008) using the theory of TAM and SDT in the field of education, namely e-learning. Similar studies related to SDT and TAM were also conducted by Buil et al. (2020) which provides a theoretical foundation based on SDT and TAM on the application of business simulation in the recruitment process using the concept of gamification.

Previous research Aguiar-Castillo et al. (2020); Buil et al. (2020); Roca and Gagné (2008) have not found any use of SDT and TAM methods on the concept of gamification in the marketplace. In addition Mitchell et al. (2017) also suggest that further research should explore further how gamification affects behavior by investigating variables that affect behavior and intrinsic motivation such as competence and autonomy. So, this study intends to examine the impact of the application of gamification in the marketplace on the feedback effect of marketplace users using SDT theory and combined with TAM. Because of the research that has been studied, it still requires further study, and this research is interesting and has not been explored by many previous researchers, besides that, along with the rapid development of the e-commerce industry in Indonesia, it is interesting to conduct further research whether the concept of gamification in the marketplace can affect marketplace users.

2. Method

This research uses the principles of the SDT theory method and is combined with the TAM method. SDT theory suggests that the basis of human motivation for certain behaviors lies in the fulfillment of three fundamental human needs, namely the need for competence, independence, and social connection (Jahn et al., 2021). While TAM is used to explain the determinants of technology acceptance, by explaining consumer behavior across various technologies (Manis & Choi, 2019).

2.1 Research Approaches and Strategies

This study uses quantitative methods that are used to empirically assess the benefits of all possible actions on various forms of media (Agnihotri et al., 2016). The marketplaces used in this research are Shopee and Tokopedia. Data collection in this study was carried out by distributing questionnaires to Shopee and Tokopedia users who use Shopee Games and Tokopedia Seru. The use of gamification in the marketplace is done by offering gifts and social networking activities in order to entertain consumers. From these experiments measured how the effect of feedback made by consumers. Is it by using the gamification approach that consumers are more motivated to participate in the use of game features on the marketplace and consumers are more motivated to use the marketplace.

2.2 Sample and Population

This study uses a sampling technique that is purposive sampling. Purposive sampling is random sampling of sampling units in population segments according to the desired characteristics or characteristics (Guarte & Barrios, 2006). This study takes samples with certain characteristics or criteria. The characteristics or criteria used in determining the sample are Shopee and Tokopedia marketplace users who use Shopee Games and Tokopedia Seru with a minimum age of 17 years.

2.3 Research Model

This study uses several variables taken from previous research conducted by Jahn et al. (2021). This research contributes to the literature on gamification with the SDT model, namely relatedness, autonomy, and competence in technology adoption. Tobon et al. (2020) argues that the use of SDT and TAM methods are the two most common theoretical explanations used in research related to the effect of gamification. Thus, this study combines the SDT model with TAM. The variables used in this study based on TAM modelling taken include Perceived ease of use, Attitude toward using,

Behavioral Intention to Use, and Perceived usefulness which are replaced with Perceived Enjoyment variables. Figure 1 is the research model used in this study.

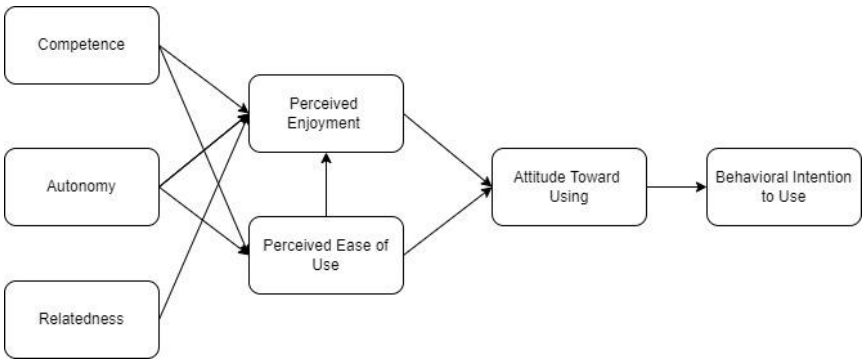

Figure 1. Research model

2.4 Research Hypothesis

Creativity is an important aspect to attract consumers. Participation in an account can be done by creating interactions between users. Research conducted by Roca and Gagné (2008) explored the role of perceived autonomy, competence and relatedness in explaining the influence of intrinsic and extrinsic motivation to continue to use IT in work settings. The result is that perceived competence, operationalized through internet self-efficacy and computer self-efficacy, has a strong influence on perceived usefulness, perceived pleasure, and also on perceived ease of use. On the other hand Lee et al. (2015) revealed that the relationship between competence and perceived enjoyment was not significant. However, it may be that the technology used in the research is not challenging enough so that competence does not play much of a role. Based on the explanation above, this study proposes the following hypothesis.

H1. The perception of competence has a positive effect on the perception of pleasure from the application of gamification features in the marketplace.

Previous research by Fathali and Okada (2018) conducted a study related to the expansion of TAM with SDT to investigate student intentions, they argued that perceived competence had a positive effect on perceived ease of use in using the system. This research is in line with previous research (Linares et al., 2021; Roca & Gagné, 2008)which also argues that perceived competence is positively related to ease of use. Based on the explanation above, this study proposes the following hypothesis.

H2. The perception of competence has a positive effect on the perception of the ease of using game features in the marketplace.

Perceived autonomy support is positively related to perceived pleasure and predicts their intention to use the system (Roca & Gagné, 2008). Based on the research framework of Linares et al. (2021) have replaced the construct of perceived usefulness with perceived pleasure in order to adapt the model to an entertainment-related context of the hypothesized relationship with the TAM variable. In this way, the construct of perceived usefulness is based on extrinsic motivation, so it cannot accurately measure the innate intrinsic motivation associated with feelings of pleasure or in-game entertainment. Based on the explanation above, this study proposes the following hypothesis.

H3. Perceived autonomy support has a positive effect on perceived enjoyment or pleasure from the application of gamification features in the marketplace.

In addition to influencing perceived enjoyment, several studies have also argued that perceived autonomy can also influence individual perceptions of ease of use (Lu et al., 2019; Nikou & Economides, 2017). This opinion is in line with Buil et al. (2020) related to applicants' attitudes towards recruitment tools that use the concept of gamification by using modelling on SDT and TAM. The study found that perceived autonomy was positively related to perceived ease of use and usefulness. Based on the explanation above, this study proposes the following hypothesis.

H4. The perceived autonomy support has a positive effect on the ease of using game features in the marketplace.

Currently, many online games can form teams to achieve common goals, so that linkages can be fulfilled (Sailer et al., 2017). The more users feel more control and connected with others, the more they enjoy using the technology (Lee et al., 2015). The gamification approach can give rise to special interactivity characteristics among users, thereby making the atmosphere more lively and closer than using other media (Yang et al., 2017). Based on the explanation above, this study proposes the following hypothesis.

H5. The need for linkage has a positive impact on the enjoyment or pleasure felt from the application of gamification features in the marketplace.

Players consider the level of enjoyment from playing games as the most significant factor and players prefer to play some mobile social games which are easier to start which do not require much effort (Chen et al., 2017). In line with other studies that perceived ease of use and the need for connectedness have an impact on perceived enjoyment (Linares et al., 2021). So that the ease of using the game can lead to a preference for the marketplace with entertaining content. Based on the explanation above, this study proposes the following hypothesis.

H6. The perceived ease of use in using game features on the marketplace has a positive impact on the enjoyment or pleasure felt.

Previous research conducted by Manis and Choi (2019) found that consumers' perceptions of usefulness, enjoyment, and ease of use were positive predictors of attitudes toward use. The study is in line with Chen et al. (2017) that enjoyment and ease of use are the main determinants of users' attitudes to playing mobile social games. Perceived enjoyment shows a stronger effect than perceived convenience, which means that entertainment-oriented technologies will get a lot of attention by the market (Chen et al., 2017). Based on the explanation above, this study proposes the following hypothesis.

H7. Enjoyment or pleasure that is felt has a positive impact on attitudes in using game features on the marketplace.

Players prefer to play some of the easier mobile social games that do not require much effort (Chen et al., 2017). In addition, usability and ease of use are positively correlated with participants' attitudes to recruitment tools created with the concept of gamification (Buil et al., 2020). This opinion is in line with Rafdinal et al. (2020) that ease of use has a significant effect on usage attitudes. The research emphasizes to practitioners, to create game features that are easy to use in order to create a pleasant experience for players, so that they can influence players' attitudes towards the game. Based on the explanation above, this study proposes the following hypothesis.

H8. The perceived ease of use in using game features on the marketplace has a positive impact on attitudes in using game features on the marketplace.

There are several studies that argue that user attitudes can affect use or behavioral intention to use. Aguiar-Castillo et al. (2020) in his research conducted research related to the use of applications in an academic environment, the results were that user attitudes encouraged intentions to use applications that used the concept of gamification. This opinion is in line with the research of Buil et al. (2020) on applicants' attitudes towards recruitment tools that use the concept of gamification, which shows that users' attitudes are significantly correlated with their intention to recommend it to other users. Chen et al. (2017) also clarifying people's attitudes and intentions towards playing mobile social games can also help uncover implications for successful game implementation. Based on the explanation above, this study proposes the following hypothesis.

H9. Attitudes in using game features on the marketplace have a positive impact on intentional behavior in using game features on the marketplace.

2.5 Measurement

In measuring and testing hypotheses, the proposed research framework uses a structural equation modelling (SEM) approach. Although a series of multiple regression analyzes can be used to analyze the model, the SEM approach was chosen because of its ability to examine direct, indirect and moderating effects (Fu et al., 2020). The item used in this study is a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) which was adapted from previous research by Casaló et al. (2021).

2.6 Data Collection Technique

There are two data collection techniques used in the research, namely literature studies and questionnaires. The literature study was conducted through research and understanding related to the gamification approach and feedback from Shopee and Tokopedia marketplace users in Indonesia. Various sources of literature or literature used include journals, books, proceedings, and websites. In addition, this study also uses a questionnaire to test and empirically examine the research hypotheses that have been proposed. There are 35 questions consisting of 7 variables. This questionnaire was created using google form because respondent data collection was done online through social media.

2.7 Data Analysis Technique

There are two data collection techniques used in the research, namely literature studies and questionnaires.

1.1.1 *Measurement Model Analysis (Outer Model)*

Measurement model analysis (outer model) also known as outer relation is an analysis that explains the relationship and characteristics between latent variables and their indicators (Semuel & Setiawan, 2018). In the outer model there are two tests including validity and reliability tests (Semuel & Setiawan, 2018). The validity and reliability tests used in the study include individual item reliability tests, internal consistency reliability tests, convergent validity tests, and discriminant validity tests.

1.1.2 *Structural Model Analysis (Inner Model)*

The inner model explains the relationship between latent variables based on substantive theory that evaluates the relationship between latent constructs (Borman et al., 2017). In the analysis of the inner model there are several tests used in this study including the path coefficient test, the coefficient of determination test, the t-test, the effect size test, the predictive relevance test, the relative impact, and model fit.

3. Results and Discussion

3.1 Results of Data Collection and Data Cleaning

The results of data collection from the distribution of questionnaires obtained 252 respondents. Data from the distribution of the collected questionnaires were analyzed using Microsoft Excel for data cleaning and demographic analysis. In addition, this study also uses SmartPLS to perform data processing for each indicator of the variable. The result is that from 252 respondents who have been collected, there are 44 respondents who show that they do not match the characteristics and are declared invalid, so that the valid data from the results of distributing questionnaires is 208 data.

Table 1. Demographic results of respondents

Category	Frequency	Percentage
Gender		
Male	83	39.9%
Female	125	60.1%
Age		
17-21	85	40.9%
22-26	117	56.3%
27-31	5	2.4%
32-36	1	0.5%
Work		
Student	175	84.1%
Government Employees	1	0.5%
Private Employees	24	11.5%
Freelancer	1	0.5%
Self-Employed	2	1.0%
BUMN Employee	1	0.5%
Medical check up	1	0.5%
Employee Staff	1	0.5%

Contract worker	1	0.5%
Other	1	0.5%
Marketplaces Ever Used		
Shopee	121	58.2%
Tokopedia	7	3.4%
Shopee and Tokopedia	80	38.5%
Marketplace Usage Intensity		
Every Day	81	38.9%
1 Time a Week	13	6.3%
< 1 Time a Week	26	12.5%
> 1 Time a Week	88	42.3%
Intensity of Use of Game Features on Marketplace		
Every Day	34	16.3%
1 Time a Week	40	19.2%
< 1 Time a Week	83	39.9%
> 1 Time a Week	51	24.5%

Table 1 is the result of demographic analysis of respondents based on several categories including gender, age, occupation, marketplace that has been used, intensity of use of marketplace, intensity of use of games on the marketplace.

3.2 Measurement Model Analysis Results (Outer Model)

3.2.1 *Item Reliability Individual Test*

The results of the loading factor value which is below 0.7 there are three indicators, namely A1, A5, and PEU4. So, this study decided to remove the three indicators. After modifying the research model, one more indicator appears below 0.7, namely C5 with a loading factor value of 0.698, so this study decided to delete one more indicator, namely C5. The results of the individual item reliability test were obtained from 35 indicators, there were 4 indicators with the loading factor value still below 0.7 so that modifications were made to the research model by removing the four indicators, and the results of this study using 31 indicators can be seen in Table 2 to continue the analysis of research result.

Table 2. Outer loading value after modification

	ATU	A	BIU	C	PE	PEU	R
A2		0.835					
A3		0.829					
A4		0.848					
ATU1	0.765						
ATU2	0.794						
ATU3	0.794						
ATU4	0.720						
ATU5	0.841						
BIU1			0.808				
BIU2			0.916				
BIU3			0.780				
BIU4			0.854				
BIU5			0.843				
C1				0.844			
C2				0.811			
C3				0.795			
C4				0.816			
PE1					0.886		
PE2					0.901		
PE3					0.876		
PE4					0.873		
PE5					0.886		
PEU1						0.850	
PEU2						0.827	

PEU3	0.812	
PEU5	0.775	
R1		0.863
R2		0.896
R3		0.908
R4		0.925
R5		0.899

3.2.2 *Internal Consistency Reliability Test*

The results of the internal consistency reliability test in Table 3 show that each variable has a Cronbach's Alpha value above 0.7. The autonomy variable has a value of 0.787, the variable attitude toward using is 0.844, behavioral intention to use is 0.896, competence is 0.836, perceived enjoyment is 0.930, perceived ease of use is 0.833, and relatedness is 0.940.

Table 3. Cronbach's alpha value

Variable	Cronbach's alpha
A	0.787
ATU	0.844
BIU	0.896
C	0.836
PE	0.930
PEU	0.833
R	0.940

In addition to Cronbach's alpha, this test was also measured using composite reliability. The results of the composite reliability values in Table 4 show that each variable has a composite reliability value above 0.7. The autonomy variable has a value of 0.876, the variable attitude toward using is 0.888, behavioral intention to use is 0.924, competence is 0.889, perceived enjoyment is 0.947, perceived ease of use is 0.889, and relatedness is 0.954.

Table 4. Composite reliability value

Variable	Composite reliability
A	0.876
ATU	0.888
BIU	0.924
C	0.889
PE	0.947
PEU	0.889
R	0.954

3.2.3 *Convergent Validity Test*

The results of the convergent validity test in Table 5 show that the AVE value in this study meets the requirements, namely above 0.5. The results of the AVE value on each variable, namely autonomy, have a value of 0.701, the variable attitude toward using is 0.615, behavioral intention to use is 0.708, competence is 0.667, perceived enjoyment is 0.782, perceived ease of use is 0.666, and relatedness is 0.807.

Table 5. Average variance extracted value

Variable	Average variance extracted (AVE)
A	0.701
ATU	0.615
BIU	0.708
C	0.667
PE	0.782
PEU	0.666
R	0.807

3.2.4 ***Discriminant Validity Test***

The results of the discriminant validity test found that the value of cross loading met the requirements, namely the value of cross loading on the intended construct was greater than the value of loading on other constructs. Table 6 is the result of the calculation of the cross-loading value.

Table 6. Cross loading value

	A	**ATU**	**BIU**	**C**	**PE**	**PEU**	**R**
A2	0.835	0.391	0.285	0.263	0.458	0.408	0.217
A3	0.829	0.396	0.389	0.363	0.444	0.367	0.290
A4	0.848	0.327	0.289	0.397	0.406	0.349	0.260
ATU1	0.344	0.765	0.559	0.475	0.476	0.373	0.463
ATU2	0.321	0.794	0.539	0.479	0.482	0.465	0.489
ATU3	0.246	0.794	0.623	0.508	0.534	0.360	0.524
ATU4	0.335	0.720	0.570	0.484	0.614	0.517	0.348
ATU5	0.466	0.841	0.676	0.522	0.804	0.649	0.415
BIU1	0.361	0.643	0.808	0.545	0.643	0.420	0.357
BIU2	0.359	0.684	0.916	0.566	0.619	0.410	0.498
BIU3	0.289	0.651	0.780	0.445	0.553	0.310	0.610
BIU4	0.386	0.612	0.854	0.512	0.595	0.424	0.478
BIU5	0.213	0.610	0.843	0.570	0.478	0.303	0.521
C1	0.298	0.505	0.498	0.844	0.414	0.267	0.526
C2	0.325	0.485	0.505	0.811	0.445	0.270	0.462
C3	0.316	0.514	0.490	0.795	0.447	0.228	0.534
C4	0.367	0.546	0.544	0.816	0.570	0.393	0.384
PE1	0.480	0.662	0.611	0.535	0.886	0.476	0.407
PE2	0.452	0.659	0.569	0.517	0.901	0.537	0.369
PE3	0.472	0.680	0.621	0.515	0.876	0.548	0.393
PE4	0.469	0.664	0.587	0.492	0.873	0.456	0.399
PE5	0.438	0.702	0.653	0.528	0.886	0.556	0.390
PEU1	0.368	0.516	0.368	0.283	0.485	0.850	0.201
PEU2	0.342	0.474	0.319	0.300	0.429	0.827	0.185
PEU3	0.368	0.462	0.355	0.325	0.438	0.812	0.151
PEU5	0.383	0.554	0.402	0.286	0.537	0.775	0.231
R1	0.249	0.470	0.498	0.507	0.379	0.198	0.863
R2	0.297	0.493	0.514	0.471	0.398	0.235	0.896
R3	0.273	0.504	0.536	0.489	0.422	0.200	0.908
R4	0.255	0.512	0.551	0.561	0.367	0.182	0.925
R5	0.290	0.554	0.535	0.551	0.415	0.249	0.899

In addition to cross loading, this test can also use the value results from Fornell-Larcker. The results of the Fornell-Larcker value in Table 7 show that the value of each latent variable is greater than the correlation of the latent variable compared to other latent variables, because the value of Fornell-Larcker is used to determine whether the AVE is greater than the quadratic correlation with other constructs, so it can it is said that the results of the discriminant validity test meet the criteria and can continue testing at a later stage.

Table 7. Fornell-Larcker value

Variable	A	ATU	BIU	C	PE	PEU	R
A	**0.837**						
ATU	0.445	**0.784**					
BIU	0.383	0.763	**0.841**				
C	0.404	0.631	0.628	**0.817**			
PE	0.522	0.762	0.689	0.585	**0.884**		
PEU	0.449	0.618	0.445	0.366	0.583	**0.816**	
R	0.304	0.565	0.587	0.573	0.443	0.238	**0.898**

3.3 Structural Model Analysis (Inner Model)

3.3.1 *Path Coefficient Test*

Path coefficient testing has an effect if it has a value above 0.1. The results of this study in Table 8 show that all path coefficient values are above 0.1, so it can be said to have an influence on the model.

Table 8. Path coefficient test results

	Path Coefficient
C→PE	0.304
C→PEU	0.220
A→PE	0.205
A→PEU	0.360
R→PE	0.123
PE→ATU	0.608
PEU→ATU	0.264
PEU→PE	0.351
ATU→BIU	0.763

3.3.2 *Coefficient of Determination Test (R^2)*

The results of the R Squared value of this study in Table 9 show that ATU, BIU, and PE have values above 0.5 but below 0.75, so they are considered moderate groups. Furthermore, PEU is included in the weak group because its value is below 0.25, which has a value of 0.242. The results can also be seen in Figure 2 which shows that variables C, A, R, and PEU are included in the moderate group (0.543) variant of PE, but variables C and A are included in the weak group (0.242) variant of PEU, while PE and PEU variables are included in the moderate (0.626) variant of ATU, and the ATU variable is also included in the moderate (0.582) variant of BIU.

Table 9. Result of R Squared value

Variable	R Squared	Description
ATU	0.626	Moderate
BIU	0.582	Moderate
PE	0.543	Moderate
PEU	0.242	Weak

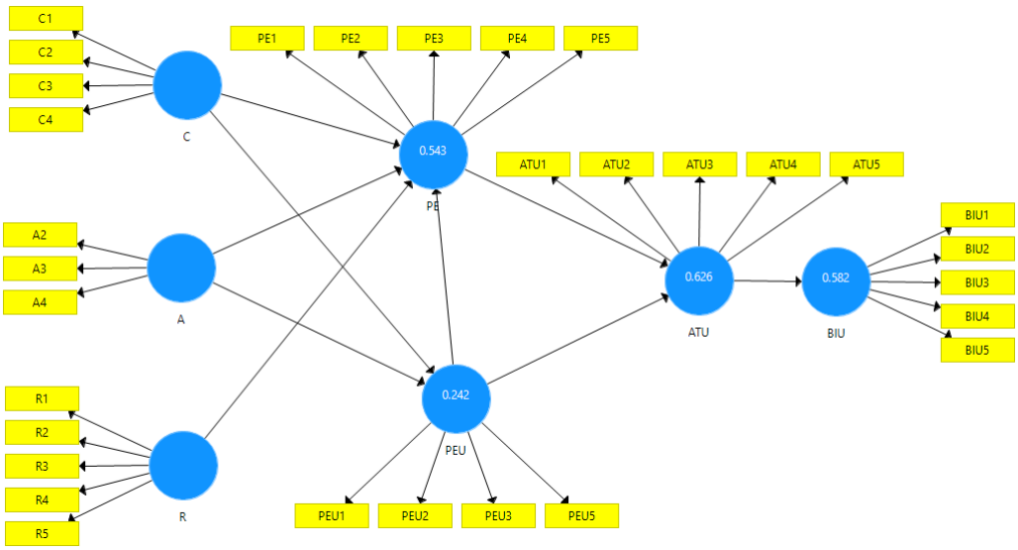

Figure 2. Coefficient of determination test results

3.3.3 *T-Test*

Testing t-test can use bootstrapping by doing a two-tailed test. The results show that the nine hypotheses have met the requirements, namely having a t-test value above 1.960. The results of the

analysis in Table 10 show that the hypothesis of this study is eligible and overall has the effect of each independent on the dependent.

Table 10. T Statistics test results

	T Statistics
A→PE	2.702
A→PEU	4.551
ATU→BIU	24.722
C→PE	5.095
C→PEU	2.848
PE→ATU	10.659
PEU→ATU	4.792
PEU→PE	3.567
R→PE	2.250

3.3.4 *Effect Size Test (f^2)*

The results of the f^2 test in Table 11 show that there are six pathways that have a small effect, namely C-PE, C-PEU, A-PE, A-PEU, R-PE and PEU-ATU. Meanwhile, one PEU-PE route has a medium effect and the other two routes, namely PE-ATU and ATU-BIU, have a large influence.

Table 11. Effect size test results

Hypothesis		f^2			Influence
No	Track	R^2in	R^2ex	$\sum f^2$	f^2
H1	C-PE	0.543	0.489	0.054/0.457=0.118	Small
H2	C-PEU	0.242	0.202	0.04/0.758= 0.053	Small
H3	A-PE	0.543	0.513	0.03/0.457= 0.066	Small
H4	A-PEU	0.242	0.134	0.108/0.758= 0.142	Small
H5	R-PE	0.543	0.533	0.01/0.457= 0.022	Small
H6	PEU-PE	0.543	0.449	0.094/0.457= 0.206	Medium
H7	PE-ATU	0.626	0.380	0.246/0.374= 0.658	Large
H8	PEU-ATU	0.626	0.580	0.046/0.374= 0.123	Small
H9	ATU-BIU	0.582	0	0.582/0.418=1.39	Large

3.3.5 *Predictive Relevance Test (Q^2)*

The test of predictive relevance is used to determine the construct of the research variable that functions to measure the research model that has been formed previously. Individual Table 12 is the result of the predictive relevance test, which results that all endogenous variables in this research model have a (Q^2) value of more than 0. The test results can be said that the variables used have predictive relationships or relationships with other variables.

Table 12. Predictive relevance test results

Variable	Q^2
ATU	0.366
BIU	0.404
PE	0.416
PEU	0.151

3.3.6 *Relative Impact (q^2)*

Relative impact testing using the blindfolding method serves to measure the relative influence of a relationship or predictive relationship of a certain variable to other variables. The results of the q^2 test in Table 13 show that there are seven pathways that have a small effect, namely C-PE, C-PEU, A-PE, A-PEU, R-PE, PEU-PE and PEU-ATU. Meanwhile, one PEU-PE route has a medium influence and the other, ATU-BIU, has a large influence.

Table 13. Relative impact test results

Hypothesis		q^2			Influence
No	Track	Q^2in	R^2ex	$\sum q^2$	q^2

H1	C-PE	0.416	0.357	0.041/0.584=0.070	Small
H2	C-PEU	0.151	0.126	0.025/0.849=0.029	Small
H3	A-PE	0.416	0.394	0.022/0.584= 0.038	Small
H4	A-PEU	0.151	0.084	0.067/0.849= 0.079	Small
H5	R-PE	0.416	0.409	0.007/0.584= 0.012	Small
H6	PEU-PE	0.416	0.343	0.073/0.584=0.125	Small
H7	PE-ATU	0.366	0.221	0.145/0.634=0.229	Medium
H8	PEU-ATU	0.366	0.339	0.027/0.634= 0.043	Small
H9	ATU-BIU	0.404	0	0.404/0.596=0.678	Large

3.3.7 **Model Fit**

The model fit index allows assessing how well the hypothesized model structure fits the empirical data and, thereby, helps identify model specification errors (Hair et al., 2017). The results of the study as shown in Table 14 indicate that the SRMR value meets the recommended criteria, namely < 0.08. Furthermore, the results of the chi square also meet the recommended criteria, namely the value criteria > 0.05. Meanwhile, the results of the NFI value are still acceptable, namely with a criterion value of 0.750 ≥ 0.90, which is included in the marginal fit category.

Table 14. The result of the fit model value

	Saturated Model	Category	Recommended guidelines	References
SRMR	0.068	*Good fit*	< 0.08	(Hair *et al.*, 2017)
Chi-Square	1249.123	*Good fit*	> 0.05	(Murwaningsari, 2010)
NFI	0.766	*Marginal fit*	0.750 ≥ 0.90	(Setiawan & Yuniarsih, 2020)

3.4 Discussion and Interpretation of Results of Structural Model Analysis (Inner Model)

3.4.1 ***The perception of competence has a positive effect on the perception of pleasure from the application of gamification features in the marketplace (H1).***

After the analysis, it was found that H1 was accepted with a t-test test value of 5.095, which means that the competence felt by the user has a positive effect on the pleasure felt by the gamification feature in the marketplace. By having the result of the path coefficient value of 0.304, which means that competence (C) has a significant influence on perceived enjoyment (PE). While the results of f^2 and q^2 have a small path from the results of their calculations. The results of this study are in line with Roca and Gagné (2008) that perceived competence has an influence on perceived pleasure. The relationship in this hypothesis shows that the competence felt by users when playing games can also cause a sense of pleasure or happiness from within the user.

3.4.2 ***Competence has a positive effect on perceptions of ease in using game features in the marketplace (H2).***

Based on the results of the analysis, it was found that H2 can be accepted with a t-test value of 2.848 which means that the competence felt by users has a positive effect on the perceived ease of using gamification features in the marketplace. In the path coefficient test, the value of 0.220 means that competence (C) has a significant influence on the perceived ease of use (PEU). While the test results f^2 and q^2 have a small path from the results of both calculations. The results of the testing of this study are in line with the research of Buil et al. (2020); Linares et al. (2021); Lu et al. (2019) which argues that perceived competence is positively related to perceived ease of use. From the results of this study, it can be said that the need for competence in the form of points, badges, or leader boards is related to the ease of playing games.

3.4.3 ***Perceived autonomy support has a positive effect on perceived enjoyment or pleasure from the application of gamification features in the marketplace (H3).***

The results of the calculation of the inner model analysis show that H3 can be accepted because the results of the t-test test are obtained with a value of 2.702 which means that the perceived autonomy affects the enjoyment or pleasure felt by the presence of gamification features in the marketplace.

Based on the results of the calculation of the value of the path coefficient is 0.205, which means that autonomy (A) has a significant influence on perceived enjoyment (PE). In addition, the results of the analysis of f^2 and q^2 have a small path from the results of both calculations. The results of this test agree with Lee et al. (2015); Roca and Gagné (2008) found that perceived support for autonomy was positively related to perceived pleasure. This shows that users find the marketplace to be more enjoyable especially when the context supports autonomy and when users have confidence in their ability to play in game features on the marketplace.

3.4.4 ***Perceived autonomy support has a positive effect on ease of use of game features in the marketplace (H4).***

Based on the results of the analysis conducted, H4 can be accepted because it has a t-test value of 4.551 which means that the perceived support for autonomy has an influence on the ease of use of gamification features in the marketplace. While the results of the path coefficient value indicate that autonomy (A) has a significant effect on perceived ease of use (PEU), which produces a value of 0.360. In addition, the results of the analysis of f^2 and q^2 have a small path from the results of both calculations. The results of this test are supported by previous research conducted by Buil et al. (2020); Lu et al. (2019); Nikou and Economides (2017) that perceived autonomy support can affect perceptions related to ease of use. The results show that the need for autonomy is significantly related to the perceived ease of use of game features on the marketplace.

3.4.5 ***The need for linkage has a positive impact on the enjoyment or pleasure felt from the application of gamification features in the marketplace (H5).***

The results of the analysis carried out found that H5 was accepted, with the result of the t-test value being 2.250, so it can be interpreted that the need for linkage affects the enjoyment or pleasure felt from the application of gamification features in the marketplace. The results of the path coefficient value also state that relatedness (R) has a significant influence on perceived enjoyment (PE) with a value of 0.123. While H5 also has a small path based on the results of the calculation of the analysis of f^2 and q^2. The results of this test are in line with those of Chen et al. (2017); Linares et al. (2021) that the need for connectedness has a positive impact on the user's perceived enjoyment or pleasure. Basically, consumers are more interested in using active interaction than passive because it can make users closer.

3.4.6 ***The perceived ease of use in using game features on the marketplace has a positive impact on the enjoyment or pleasure felt (H6).***

Based on the results of the inner model analysis in the test, it shows that H6 is accepted with a t-test value of 3.567 so that it can be said that the ease of using the gamification feature in the marketplace has a positive impact on the enjoyment or pleasure felt. In addition, the path coefficient analysis results obtained at 0.351 which means that the perceived ease of use (PEU) has a significant influence on the perceived enjoyment (PE) variable. While the results from the analysis of the value of f^2 produced are included in the category of the intermediate path, but from the results of the analysis the value of q^2 is included in the category of the small path. The results of this test are supported by previous research conducted by Linares et al. (2021) that perceived ease of use has a positive impact on perceived enjoyment. The results of the research show that players prefer to play some games that are easier to use, so they don't require much effort.

3.4.7 ***Enjoyment or pleasure that is felt has a positive impact on attitudes in using game features on the marketplace (H7).***

The results of the inner model analysis on the t-test value show that H7 is accepted with a value of 10.659 so it can be interpreted that enjoyment or pleasure has a positive impact on user attitudes in using gamification features in the marketplace. In addition to the t-test value, it is also supported by the path coefficient test results, namely 0.608 which shows that perceived enjoyment (PE) has a significant influence on the attitude toward using (ATU) variable. While the path in the calculation of f^2 the results include having a large influence value, but the results of the calculation of q^2 have a medium effect. The results of this test are supported by previous research conducted by Chen et al. (2017) that the enjoyment felt by users affects the user's attitude to playing games. From this study it was found that perceived enjoyment and convenience are the main determinants of user attitudes to playing games.

3.4.8 ***The perceived ease of use in using game features on the marketplace has a positive impact on attitudes in using game features on the marketplace (H8).***

The results of the analysis show that the value of the t-test on the inner model H8 is acceptable with the results of the calculation of 4.792, so it can be stated that ease of use has a positive impact on attitudes in using gamification features in the marketplace. The results of this analysis are also supported by the results of the path coefficient test, which is 0.264 so that it can be interpreted that perceived ease of use (PEU) has a significant influence on the attitude toward using (ATU) variable. In addition, this path based on the results of the calculation of f^2 and q^2 shows that it has a small influence value. The results of this test are inline with previous research that ease of use affects usage attitudes (Chen et al., 2017; Manis & Choi, 2019; Rafdinal et al., 2020). So, this study emphasizes providing recommendations in creating game features on the marketplace that are easy to use in order to create a pleasant experience for players, so that it can influence players' attitudes towards game users on the marketplace.

3.4.9 ***Attitudes in using game features on the marketplace have a positive impact on intentional behavior in using game features on the marketplace (H9).***

The results of the inner model analysis on the t-test test stated that H9 was acceptable. Because the results of the t-test test yielded a value of 24.722, so it can be said that attitudes in using game features on the marketplace have a positive impact on intentional behavior in using these features. In addition, the results of the path coefficient test show that attitude toward using (ATU) has a significant influence on the behavioral intention to use (BIU) variable with a value of 0.763. While this path also has a large influence value based on the calculation of f^2 and q^2. The results of this test agree with Aguiar-Castillo et al. (2020); Buil et al. (2020) that user attitudes in using applications that use the concept of gamification have a positive impact on intentional behavior in using applications that use the concept of gamification.

4. Evaluation and Recommendation

This study has several similarities conducted by Yang et al. (2017). However, this study has the advantage that it does not only use one method, namely TAM, but this research combines two methods, namely TAM and SDT. In addition, this research also uses two marketplaces as case studies. This research also has weaknesses that can be evaluated, including the demographic results of respondents, marketplace users are more dominated by users in the Shopee marketplace, so this research explains more about Shopee users compared to Tokopedia. The results of data collection in this study also found some invalid data, namely 19 data so that invalid data was deleted. Furthermore, the results of the loading factor of this study also contained four indicators that were declared less valid, so modifications were made to the research model. The results of this study as a whole show that the user's attitude towards the intention to use game features on the marketplace has the highest value from the analysis results, so it can be said that the user's attitude greatly determines the user's continued use of the marketplace. In addition, the pleasure felt towards the attitude in using game features on the marketplace also produces a high value, so from the results of this study it is recommended to the marketplace service providers in making game features that user pleasure is prioritized so that users use marketplace services on an ongoing basis.

5. Conclusion

Based on the results of the research, all hypotheses in this study were accepted as many as 9 hypotheses. There are two relationship variables that have a fairly large influence value between each other, including the perceived enjoyment variable on the attitude toward using variable and the attitude toward using variable on behavioral intention to use. The results of this study show that the user's attitude towards the intention to use game features on the marketplace has the highest value from the analysis results, so it can be said that the user's attitude greatly determines the user's continued use of the marketplace. In addition, the pleasure felt towards the attitude in using game features on the marketplace also produces a high value, so it can be concluded that the user's pleasure when playing games on the marketplace is one of the main factors in determining user attitudes towards the marketplace. The results of this study provide advice to the marketplace service provider in making game features prioritizing user pleasure so that users use marketplace services on an ongoing basis. In

addition, further research is expected to be able to review each indicator used in making the questionnaire to avoid deleting indicators during data processing.

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