Does gamification on an e-commerce application lead intention to use the application and spread word of mouth?

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Kunthi Afrilinda Kusumawardani* and Laura Fabiola Soegihono

Faculty of Business,
President University,
Jababeka Education Park,
Jl. Ki Hajar Dewantara, RT.2/RW.4, Mekarmukti,
Cikarang Utara, Bekasi Regency, West Java 17530, Indonesia
Email: kunthi.kusumawardani@president.ac.id
Email: laurafabiolas@ymail.com
*Corresponding author

Abstract: This research aims to evaluate the effect of e-commerce gamification on post-adoption behavioural intention on an e-commerce application in Indonesia mediated by flow experience, perceived usefulness, perceived ease of use, and attitude. The structural equation modelling analysis was chosen to examine the data using 325 respondents who are active users who play the games in the e-commerce app. The research results found that attitude towards gamification is a strong predictor in determining continued use intention and intention to spread the WOM of the e-commerce application. Besides, flow experience, perceived ease of use, and perceived usefulness will shape a positive attitude towards gamification, leading to continued use intention and intention to spread WOM. Findings in this research provide empirical evidence of gamification's use in an e-commerce application in a developing country. It underlines the importance of using gamification to shape the attitude to keep using the e-commerce application and spread WOM.

Keywords: gamification; e-commerce; attitude; flow experience; continued use intention; CUI; word of mouth; WOM; Shopee; Indonesia.

Biographical notes: Kunthi Afrilinda Kusumawardani earned her Bachelor in International Relations from President University, Indonesia in 2012. She received her Master's in Business Administration from Cardiff Metropolitan University, the UK in 2015 and is currently a Lecturer in Business Administration at the School of Business, President University, Indonesia. Before joining the university, she had more than five years of professional marketing and business development experience. Her current research interests are in marketing, tourism, and human resource management.

Laura Fabiola Soegihono is a cum laude graduate from President University, Indonesia. Currently, she is a Master's degree student at Diponegoro University, Indonesia. Her research interest includes Business Management,

Marketing, and Entrepreneurship. She participated in academic and non-academic activities, including her participation in AIESEC Global Volunteer Program in Vietnam and also as a Global Village to represent Indonesian culture.

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1   Introduction

The Internet has become an essential and inseparable part of life and impacts people's activities. One of them is in the field of e-commerce (Vuong, 2019). Nowadays, online shopping is becoming the most popular activity globally. Retail e-commerce sales worldwide reached USD 3.53 trillion in 2019 and are predicted to reach USD 6.54 trillion in 2022 (Clement, 2020). Indonesia has become one of the countries with the fastest e-commerce growth. Since 2014, online sales in Indonesia have reached USD 1.1 billion. With 138 million people shopping online, and the e-commerce sector is accounted for 72% of digital economy value, Indonesia is the ninth largest e-commerce market in the world (Kaplan, 2022).

The growth of e-commerce mobile applications is very robust, with almost 50,000 shopping apps added to Google Play, and 21,000 to Apple App Store in 2018 (Droesch, 2019). The growth of the market is followed by fierce competition. However, mobile apps are frequently downloaded and stored on mobile portable devices, only to be used once. Hence, to secure a return on investment, app providers must first attract users to the app and also retain them over time. Besides, large segments of the world's population have already 'accepted' new technology, thus, it is critical for studies to shift their focus from 'adoption' to 'continued use' (Choi and Sparks, 2018). Moreover, another critical indicator of customer loyalty in the mobile app sector is word of mouth (WOM) intentions, or willingness to recommend the app to other customers (Belanche et al., 2010) to ensure the app longevity.

Integrating customers into the creation of new products is believed to be a crucial determinant of successful co-creation initiatives, particularly on service businesses like online platforms (Grönroos, 2011; Leclercq et al., 2017). One of the ways to co-creating value together is through gamification, a technique that used the game concept in non-game contexts (Setiana and Hansun, 2017). Gamification described point systems, levels, or badges that identify every individual's advancement in taking an interest in the particular tasks (Hwang and Choi, 2020). It is also has been defined as the utilisation of game structure components in non-game products or services to encourage the creation of behavioural values such as increased engagement, expand sales, and increased customer loyalty (Rodrigues et al., 2014; Hofacker et al., 2016; Hamari, 2017). Due to its effectiveness, gamification has been utilised in various business industries, including web-based business (e-commerce) and advertising (Hamari, 2017). Thus, to fully comprehend the expansion of e-commerce apps among customers, this study aims to examine gamification's role in an e-commerce application in shaping the intention to continue to use the application and spread WOM.

Previous studies have discussed gamification in e-commerce platforms (García-Jurado et al., 2019; Sukmaningsih et al., 2020; Aparicio et al., 2021). However, most of them are focusing on the behavioural intention, in the particular purchase or repurchase intention, and leaving the two most critical indicators of application longevity,

continued use intention (CUI) and intention to WOM. Hence, this study fills the theoretical gap in two ways. First, this study explores factors influencing both intentions to continue using and spread WOM that have never been studied before in the case of gamification in e-commerce apps. Second, this study adopts the approach of TAM (Davis et al., 1989), and incorporate an essential factor in the setting of a computer-mediated environment to explain the consumer behaviour called flow (García-Jurado et al., 2019). The study also includes attitude (Hwang and Choi, 2020; Hamari and Koivisto, 2015) to predict the intention to continue using the application and spreading WOM. Further, this study provides deep insights into the effect of gamification in e-commerce applications in shaping customer behaviour in the setting of an emerging market. Finally, the findings give valuable research material that could support e-commerce application providers develop marketing strategies, while the work's limitations may suggest future research opportunities.

2 Literature review

2.1 Gamification

Gamification is a term that assigns the utilisation of components of game plan components in a non-game context (Rodrigues et al., 2014). According to Hofacker et al. (2016), gamification can also be described as the utilisation of game structure components in non-game products or services to encourage the creation of behavioural values such as increased consumption or loyalty. Gamification alludes to adding games to a current framework or system instead of building an altogether new game (Hamari and Koivisto, 2013). Gamification originated from the digital media industry, which was established in 2008 without board appropriation until 2010 (Deterding et al., 2011). Gamification can be described with design principles, systems, and processes to influence and inspire people to encourage behaviour creation with the results of the desired effect (Rodrigues et al., 2014). It includes a point system, levels, or badge that identify every individual's advancement in taking an interest in the particular tasks (Hwang and Choi, 2020).

Gamification is implemented in various business contexts, such as web-based business and advertising, to accomplish more customer engagement and loyalty to expand sales (Hamari, 2017), and even to identify leadership styles in companies (Pereira et al., 2021). Based on previous research by García-Jurado et al. (2019), gamification is measured by the design of points, badges such as top 100 players, and reputation from comments. Gamification also can be measured by happiness when playing the game (Rodrigues et al., 2014). Another research measures gamification through interactivity and award received (Rodrigues et al., 2016).

According to García-Jurado et al. (2019), gamification's success can be identified through the measurement of flow experience, perceived ease of use (PEOU), and perceived usefulness (PU) felt by customers. Flow experience is one of the essential factors in an e-commerce platform. The gamification will increase the enjoyable experience, which leads to the flow experience. Besides, Lee (2019) also found that gamification has a significant positive influence on flow experience.

The previous study also mentioned that PEOU could be measured by gamification (García-Jurado et al., 2019). Similarly, Manganello and Pozzi (2019) identified that

gamification has a significant positive influence on PEOU. The higher convenience the user feels when using gamification, the higher ease of use. Thus, gamification may affect the PEOU of the customer using gamification.

Furthermore, PU was found to affect attitudes toward gamification. When someone sees something useful and can use the system to get gamification's benefits, it will develop and increase a positive attitude toward gamification (Aydin, 2015). Moreover, Yang et al. (2017) found that gamification may affect PU. It means that the relationship between the game and the brand can build a valuable branding system. Customers who see the game as helpful in the brand's familiarity are engaged in the gamification procedure.

Based on the relationship between the variables, this research posits the following hypothesis:

H1 Gamification significantly influences flow experience.

H2 Gamification significantly influences PEOU.

H3 Gamification significantly influences PU.

2.2   Flow experience

Flow is the pleasant experience felt by individuals when acting with all-out contribution involvement and immerses in the activity (Hung et al., 2012). Flow can also be defined as the situation in which a person acts with an all-out association, ingested in tasks that are being carried out thoroughly (García-Jurado et al., 2019). Huang et al. (2012) agreed that flow is a crucial concept to explain consumer behaviour in e-commerce. Flow is usually associated with outcomes in online contexts, including loyalty, continued intention to repurchase, and return (Hausman and Siekpe, 2009; Siekpe, 2005; Wu and Chang, 2005).

According to Bilgihan et al. (2014), flow experience can be measured by interactivity, vividness, perceive ease of use, media richness, clear goals, PU, speed, and challenge. Sanchez-Franco (2010) found that flow experience has a significant positive influence on PEOU. When users get the experience of flow that is felt, then the intrinsic enjoyment, which is a preceding of PEOU, will also increase. A previous study found that flow experience has a significant influence on PEOU in Generation X. However, interestingly, there is no significant relationship between flow experience and PEOU in millennials (García-Jurado et al., 2019). Moreover, previous studies found that flow experience has a significant influence on PU (Sarkar and Khare, 2019; Sanchez-Franco, 2010). Based on the relationship between the variables, this research posits the following hypothesis:

H4 Flow experience significantly influences the PEOU.

H5 Flow experience significantly influences PU.

2.3   Perceived ease of use

PEOU is the extent to which people accept using innovative technology with no effort (Davis, 1989). Similarly, Rodrigues et al. (2016) mentioned that PEOU is how far customers could receive gamified business applications since they saw them as simple or easy. PEOU has developed as one of the main preceding for technology adoption (Hamari and Koivisto, 2015). PEOU is useful for initial innovation, adoption, and

sustainable use. It represents the extent to which the technology is adopted or using the system with no effort (Davis et al., 1989). It is proven that PEOU becomes an essential component of the adoption process of a system or technology (Lin et al., 2007).

Based on previous research conducted in the UK, PEOU can be measured through the feeling of easiness and flexibility when playing the game and competing with others (Yang et al., 2017). Aydin (2015) found that PEOU has a significant positive influence on PU. Suppose gamification is perceived as easy to use. More usefulness is provided to its users, which leads to a positive attitude toward gamification. Another research showed that PEOU positively influences PU (Rodrigues et al., 2016).

Vanduhe et al. (2020) found that PEOU significantly influences attitude. Suppose the gamification system is challenging to use. In that case, the user's negative attitude towards the system will also increase because the user has difficulty obtaining pleasure from the system and cannot see gamification's value (Aydin, 2015). Based on the relationship between the variables, this research posits the following hypothesis:

H6 PEOU significantly influences PU.

H7 PEOU significantly influences attitude.

2.4   Perceived usefulness

PU is the level of how much an individual accepts that utilising the innovation of technology would improve the performance (García-Jurado et al., 2019). PU can also be described as to what extent people believe that their technology can improve their work (Deterding et al., 2011). The relationship between the game and the brand can build a valuable branding system. Customers who see the game as helpful in the brand's familiarity are engaged in the gamification procedure (Yang et al., 2017). According to Rodrigues et al. (2016), PU is measured by Gamification. Based on previous research conducted by Yang et al. (2017), PU can also be measured by familiarity with the app and usefulness for branding the app. Moreover, PU is measured through easiness, usefulness, and effectiveness to buy the product (Hamari and Koivisto, 2015).

The research conducted by Hamari and Koivisto (2015) showed that the more usefulness is realised and felt means the higher the favourable attitudes toward the behaviour of using gamification. Thus, PU has a significant positive influence on attitude. According to Vanduhe et al. (2020), PU has a significant positive effect on attitude. When someone finds something useful and can use the system to get gamification benefits, it will develop and increase gamification's positive attitude. Hence, PU has a significant positive influence on attitude (Aydin, 2015). This research paper is mainly focusing on the relationship between PU and attitude in Shopee. Based on the relationship between two variables, this research posits the following hypothesis:

H8 PU significantly influences attitude.

2.5   Attitude

Attitude is defined as learning tendencies that guide reactions that manage their response to a thing, thought, or opinion (Fishbein and Azjen, 1975). Attitude can also be defined as the degree of favourable or unfavourable assessment of the actions referred to by the person (Aydin, 2015). Attitude happens when individuals assess the results of behaviour

based on their experience (Kashife et al., 2018). Attitude is the integration and combination of three components: affect, cognition, and the system's behaviour. If one component changes, it will affect the other because the three of them influence each other (Nugraha et al., 2018). When people consider the results of beneficial behaviour, then they will think that behaviour is beneficial. Like the website, if the website is deemed to be useful, it will be judged as a favourable decision (Hsu et al., 2017). Thus, considering attitude is imperative to comprehend gamification's character attributes to custom loyalty and behavioural intentions (Hwang and Choi, 2020). They are increasing the favourable attitudes toward gamification, which leads to CUI in using gamification (Hamari and Koivisto, 2015). According to Hwang and Choi (2020), attitude is measured by the gamified loyalty program and reward type. Based on previous research conducted by Hamari and Koivisto (2015), attitude can be measured by usefulness, ease of use, enjoyment, recognition, social influence, and playfulness. In another research conducted in the United States, attitude can also be measured by network exposure (Hamari and Koivisto, 2013).

According to Aydin (2015), attitude showed a positive relationship with the continued to use intention. If someone develops a positive attitude towards gamification, they will use it which will lead to continued use to intention. According to Hamari and Koivisto (2013), an attitude positively influences CUI. Another research also supports the statement, which showed that attitude positively influences CUI (Hamari and Koivisto, 2015).

Furthermore, attitude is also found to affect the intention to spread WOM (Hamari and Koivisto, 2015). According to Hamari and Koivisto (2013), attitude has a significant influence on WOM. Another research conducted by Hsu et al. (2017) supports this statement, which showed that attitude positively influences WOM. Based on the relationship between two variables, this research posits the following hypothesis:

H9   Attitude significantly influences the continued to use intention.

H10 Attitude significantly influences the Intention to spread WOM.

2.6   Continued to use intention

Through the fulfilment of customer expectations, customer loyalty is formed, which is a commitment from customers to make continuous purchases of products or services in the future (Kusumawardani et al., 2017). CUI can be described as customer satisfaction with the system and its availability to recommend products or services to others (Thadani and Cheung, 2012; Kim and Son, 2009; Srinivasan et al., n.d.). CUI can also be defined as a mental tendency about the intention to continue using the application for an extended period (Bhattacherjee, 2001). Thus, it can be concluded that continued to use intention would happen if they decided to use the application for a longer time once they feel that it benefits them. According to the research conducted by Hamari and Koivisto (2015), CUI is measured by usefulness, ease of use, enjoyment, playfulness, recognition, social influence, and attitude. Based on the previous research, CUI can also be measured by social influence, attitude, recognition, network exposure, and reciprocal benefit (Hamari and Koivisto, 2013).

2.7 Intention to spread WOM

WOM is described as the availability and desire of individuals to recommend a system to others (Hamari and Koivisto, 2015). WOM can also be explained as informal communication to other consumers relating to ownership, use, goods and services, and the seller (Westbroo, 1987). According to Reichheld (2004), WOM refers to the customer's intention to suggest the product or service to other people. WOM has long assumed an essential role in the marketing mix in companies (Schumann et al., 2010). Higie et al. (1987) confirmed that WOM is a trustworthy and influential source of information. WOM also provides information about the company and often helps consumers decide. On the other hand, WOM can also help provocation in brand changes and help companies engage new customers (Yoo et al., 2015). Positive WOM will encourage brand selection. However, negative WOM will affect and hinder someone from choosing a brand (East et al., 2008).

According to Hamari and Koivisto (2013), WOM's intention is measured by recognition, reciprocal benefit, social influence, network exposure, and attitude. Another research conducted in Taiwan measured the intention to spread WOM through user experience, user attitude, information value, transaction value, experiential value, social value, utilitarian features, and hedonic features (Hsu et al., 2017).

2.8 Research gap

The discussion above has shown that gamification has a positive and significant effect on behavioural intention and also customer loyalty. However, the study on gamification in the context of e-commerce application is rather scarce, and none of them is investigating the intention to continue using the app and also the intention to recommend it to others. Most studies concentrated only on the purchase intention in the application (García-Jurado et al., 2019; Sukmaningsih et al., 2020; Aparicio et al., 2021). On the other hand, retaining customers is crucial for a business, as it is less costly than acquiring new customers (Hill and Alexander, 2006). Consequently, to retain customers and achieve a return on investment, e-commerce apps need to understand customers' decision-making process in the post-adoption phase (Choi and Sparks, 2018). Therefore, this study aims to investigate factors affecting the CUI and spread of WOM towards e-commerce apps post-adoption, especially through the stimulus of gamification.

Figure 1 Research model
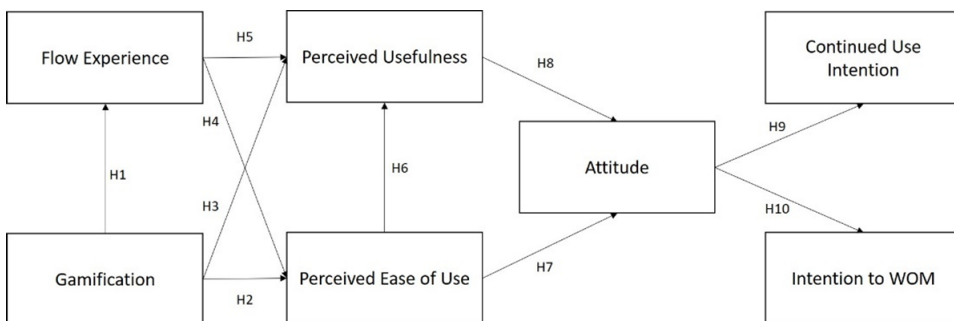
Source: Developed by the researchers based on previous studies

Furthermore, technology acceptance model (TAM) has been widely accepted to test the post-adoption behaviour. Although there are prior studies that discussed the gamification of e-commerce apps in Indonesia, none are using the approach of the TAM. Moreover, people are enjoying more gamification when there is a flow state that influences their perception of ease of use which leads to behavioural intention. Hence, this study examines the effect of gamification on post-adoption behaviour by the approach of TAM and flow. Thus, there are seven variables used in this model (see Figure 1).

3   Methodology

3.1   Data collection

This research aims to discover gamification's influence on loyalty on an e-commerce application in Indonesia, measured by the significance between variables. Therefore, a quantitative method was chosen to answer the research question because it can get broad general research results and be presented comprehensively and concisely. The researchers began by making observations in the field aimed at finding problems to be addressed. Then, the researchers studied the literature and previous studies to find the research gap in this research. Next, the researchers determined the type of research, sampling design, and the method used to analyse the data.

This research was conducted in Indonesia from May until August 2020. The sampling design is non-probability with purposive sampling. In this research, the researcher made close-ended questions on the online questionnaire via the Google Form for the primary data. The questions made have been adjusted from the previous study and translated into Indonesian, aiming to prevent the respondent's misunderstanding. The questionnaire was spread to the target respondents through an online platform or social media such as LINE, WhatsApp, and Instagram within 2–3 weeks. After the data collected reached the target, the data were exported to Microsoft Excel and then analysed using Smart-PLS. Lastly, the research presented and explained the data through secondary data and then makes a conclusion and implication of the study.

3.2   Sample characteristic

In this research, non-probability purposive sampling was chosen to allow bias to enter a sample and make it less likely to represent the population of interest (Macnee and McCabe, 2008). Shopee is the largest e-commerce platform in Indonesia and occupied the first position, with 72 million visits each month (Maarif, 2020). Their gamification strategies are called Shopee games (e.g., Shopee Tanam, Shopee Lucky Prize, Koin Shopee, Shopee Candy, Shopee Poly, Shopee Capit, Shopee Joget, Shopee Tangkap, Shopee Lempar, Shopee Potong) (Yeo, 2020). Hence, this research determined the valid respondents are people between the age of 12 – 50 years old who have used an e-commerce platform called Shopee in the last six months, play their gamification strategy called Shopee Games and recommend the apps to others. There is no restriction on occupation and gender.

Among the 325 respondents who have filled the questionnaire, most of them are female, with 216 (66.5%), and 40 of them male (33.5%). The majority of respondents are 19–30 years old, with 302 (92.9%). Most of the respondents were students (293; 90.2%).

Most respondents play Shopee games a couple of times a week, with 85 respondents (26.2%), followed by once a day with 69 respondents (21.2%). This number shows how addicting the gamification on the e-commerce application is to the respondents.

3.3 Instrument and operational definitions

In this research, the researcher used an online questionnaire to provide validity for this research. Questionnaires can also collect data from many respondents' views and opinions (Wilkinson and Birmingham, 2003). In creating the questionnaire, Google Form was chosen as the platform. There are 44 questions with each variable consists of 5–8 questions with using seven-points Likert scale from 1 to 7 (1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = neutral, 5 = slightly agree, 6 = agree, 7 = strongly agree). The seven-point Likert scale can provide a wide range of options that will improve score differentiation and make it more reliable on the data collected more.

Operation definition of variables was originated from García-Jurado et al. (2019), Rodrigues et al. (2014, 2016), Bilgihan et al. (2014), Yang et al. (2017), Hamari and Koivisto (2015), Suh et al. (2017) and Hsu et al. (2017).

Table 1 Descriptive statistics of respondents' profiles

Variable		n	%
Gender	Male	40	33.5%
	Female	216	66.5%
Age	12–18	18	5.5%
	19–30	302	92.9%
	31–50	5	1.5%
Occupation	Students	293	90.2%
	Employees	21	6.5%
	Freelancer	5	1.5%
	Housewives	3	0.9%
	Entrepreneurs	3	0.9%
Reasons for using the e-commerce app	Low price	247	76%
	Lots of product	245	75.4%
	Easy to use	152	46.8%
	Lots of sellers	150	46.2%
	Good app design	63	19.4%
	Others	15	4.5%
Frequency of playing games in the app	More than once a day	61	18.8%
	Once a day	69	21.2%
	Once a week	16	4.9%
	A couple of times a week	85	26.2%
	Once a month	32	9.8%
	A couple of times a month	62	19.1%

Table 2   Means and standard deviations of survey items

Construct	Measure	Mean	SD	Loading	Scale references
Gamification	I feel the points system correctly reflects my efforts to play the games in Shopee	5.47	1.443	0.818	García-Jurado et al. (2019), Rodrigues et al. (2016)
	I feel the waypoints are received when commenting on products are understandable	5.46	1.304	0.784	
	The badges that can be obtained from Shopee (for example, Top Player 100) reflect the good work done as a game player	5.36	1.309	0.775	
Flow	I feel that games in Shopee are interactive	5.38	1.415	0.763	Bilgihan et al. (2014)
	I feel in control when using the games in Shopee	5.27	1.463	0.713	
	I feel be able to interact online with games in Shopee	5.02	1.414	0.750	
	My imagination is aroused when play games in Shopee Application	4.90	1.607	0.737	García-Jurado et al. (2019)
	I feel that playing games in Shopee required a lot of concentration	4.89	1.610	0.725	
	I feel focused intensely when playing the games in Shopee	4.90	1.606	0.767	
	I feel it is a fun experience when playing the games in Shopee	5.20	1.404	0.751	
	I feel excited when playing the games in Shopee	5.35	1.472	0.703	
	I enjoy playing the games in Shopee	5.41	1.337	0.700	
Perceived usefulness	I think the games increase my familiarity with Shopee	5.10	1.685	0.767	Yang et al. (2017)
	I find the game is useful in branding Shopee	5.57	1.376	0.700	
	By playing Shopee games, I feel easier to buy the product on Shopee	5.05	1.530	0.792	Hamari and Koivisto (2015)
	I find playing Shopee games is useful to buy a product on Shopee	5.28	1.435	0.741	
	I feel more effective with regards to buying a product when using gamification in Shopee	5.04	1.553	0.764	
Perceived ease of use	I find it easy to learn how to play the games and compete with another person	5.46	1.348	0.783	Yang et al. (2017)
	I feel flexible to play the games and compete with other people	5.30	1.272	0.765	
	I feel easy to access the games and get another person to compete	5.32	1.382	0.805	Rodrigues et al. (2016)
	I can quickly find the information I need on these games	5.29	1.364	0.764	
	I think the game is clear and understandable	5.80	1.220	0.750	
Attitude	I find that playing games in Shopee are a wise thing to do	5.09	1.531	0.851	Hamari and Koivisto (2015)
	I find that playing games in Shopee are a good idea	5.27	1.373	0.841	
	I find that playing games in Shopee are a positive thing	5.28	1.255	0.777	
Continued use intention	I will use Shopee more frequently rather than less frequently	5.48	1.341	0.807	Hamari and Koivisto (2015), Suh et al. (2017)
	I will use Shopee more often rather than less often during the next couple of months	5.40	1.336	0.828	
	I will continue using Shopee rather than any e-commerce application	5.42	1.353	0.741	
The intention of word of mouth	I will recommend Shopee to my friends	5.78	1.248	0.816	Hamari and Koivisto (2015), Hsu et al. (2017)
	I will recommend Shopee to anyone who seeks my advice	5.49	1.256	0.768	
	I will refer my acquaintance to Shopee	5.55	1.153	0.825	

3.4   Data analysis

In terms of checking the correlation between variables, the researcher used Smart-PLS. Factor analysis was used as a validity check of the item of each variable. This aims to check whether the data is valid or not and indicate the relationship among variables (Khosrow-Pour, 2005). Validity can be measured through average variance extracted (AVE) (AVE > 0.5) (Bagozzi and Yi, 1988). Furthermore, a reliability test was used to describe the general consistency of the estimation among variables and answer connections between respondents (Alarcón, 2015). Khosrow-Pour (2005) stated that Cronbach's alpha was used to assess each variable's reliability to check whether the variable is reliable or not (Cronbach's $\alpha \geq 0.6$) (Burton and Mazerolle, 2011). According to Alarcón (2015), reliability can also be measured by composite reliability (CR ≥ 0.7). Discriminant validity is used to check the extent to which the variables' measure is different and unrelated (Campbell and Fiske, 1959). According to Henseler et al. (2015), the value of HTMT must be lower than 0.90 to be considered acceptable.

In testing the hypothesis in Smart-PLS, bootstrapping was used. Therefore, to be considered a significant hypothesis, there are two criteria. Firstly, T-statistics must be greater than 1.96 (Wong, 2013). Then, the significance or P-value must be lower than 0.05 (P-value < 0.05) (Malhotra, 2010). Then, multiple R square or square multiple correlations can be used to how many independent variables affect the dependent variable.

4   Analysis and discussion

4.1   Validity and reliability test

4.1.1   Convergent validity

The first test in this study was the validity test. A validity test is used to check whether the data is valid or not and indicate the relationship among variables (Khosrow-Pour, 2005). The validity test was tested using Smart-PLS with the AVE value that should be exceeded or equal to 0.5 (Bagozzi and Yi, 1988). The result showed that the AVE values fulfilled the criteria. The result of all the validity tests is shown in Table 3.

Table 3   Validity test

	Average variance extracted (AVE)
Attitude	0.678
Continued use intention	0.629
Flow experience	0.534
Gamification	0.571
Intention to spread WOM	0.646
Perceived ease of use	0.523
Perceived usefulness	0.544

4.1.2 Reliability test

The reliability test is used to describe the general consistency of the estimation among variables and answer connections between respondents (Alarcón, 2015). Cronbach's alpha with minimum value measures the reliability test in this study should be exceeded or equal to 0.6 (Cronbach's $\alpha \geq 0.6$) to be accepted (Burton and Mazerolle, 2011). The results are as followed: attitude (ATT; 0.762), CUI (0.706), flow experience (FLOW; 0.875), gamification (GAM; 0.745), PEOU (0.767), PU (0.789), and intention to WOM (0.727). Thus, all the variables have fulfilled the criteria.

According to Alarcón (2015), the reliability test can also be measured by CR with the value of CR being greater than or equal to 0.7 (CR $\geq$ 0.7) to be accepted. The result showed that attitude (ATT, 0.863), CUI (0.835), flow experience (FLOW, 0.875), gamification (GAM, 0.841), PEOU (0.844), PU (0.855), and intention to WOM (0.845) are reliable. The result of all the reliability tests is shown in Table 4.

Table 4   Reliability test

	Cronbach's alpha	Composite reliability (CR)
Attitude	0.762	0.863
Continued use intention	0.706	0.835
Flow experience	0.875	0.902
Gamification	0.745	0.841
Intention to spread WOM	0.727	0.845
Perceived ease of use	0.767	0.844
Perceived usefulness	0.789	0.855

4.1.3 Discriminant validity test

The discriminant validity test is used to check the extent to which the variables' measure is different and unrelated (Campbell and Fiske, 1959). Discriminant validity can be measured by the Fornell-Larcker value must be lower than 0.90 to be considered acceptable (Hair et al., 2017). All the results of the discriminant validity test are shown in Table 5.

Table 5   Fornell-Larcker test result

	ATT	*CUI*	*FLOW*	*GAM*	*WOM*	*PEOU*	*PU*
ATT	0.824						
CUI	0.528	0.793					
FLOW	0.714	0.511	0.731				
GAM	0.574	0.536	0.659	0.756			
WOM	0.578	0.640	0.522	0.513	0.804		
PEOU	0.607	0.465	0.660	0.562	0.527	0.723	
PU	0.692	0.499	0.682	0.569	0.536	0.552	0.737

## 4.2 Hypothesis testing and R-square

After testing the validity and reliability, bootstrapping was used to test all the hypotheses. In testing the hypothesis, two criteria must be considered. Firstly, T-statistics must be greater than 1.96 (Wong, 2013). Then, the significance or P-value must be lower than 0.05 (P-value < 0.05) to be accepted for a significant hypothesis (Malhotra, 2010). All hypotheses were accepted. The result for all the hypothesis testing is shown in Table 6, and the inner model is shown in Figure 2.

Table 6   Hypothesis testing

Hypothesis		β	T statistics	P-values	Significance
H1	Gamification → Flow	0.659	18.009	0.000	Significant
H2	Gamification → Perceived ease of use	0.224	3.875	0.000	Significant
H3	Gamification → Perceived usefulness	0.179	2.602	0.010	Significant
H4	Flow → Perceived ease of use	0.513	8.778	0.000	Significant
H5	Flow → Perceived usefulness	0.472	6.536	0.000	Significant
H6	Perceived ease of use → Perceived usefulness	0.141	2.057	0.040	Significant
H7	Perceived ease of use → Attitude	0.324	5.396	0.000	Significant
H8	Perceived usefulness → Attitude	0.513	10.253	0.000	Significant
H9	Attitude → Continue use intention	0.528	9.796	0.000	Significant
H10	Attitude → Intention to spread WOM	0.578	12.142	0.000	Significant

In testing, the R-square can be used to show how many independent variables affect the dependent variable. The aim is to see whether our model variable is compatible with information or not (Teo et al., 2013). R-square is considered substantial if the R-square value is around 0.67, considered moderate if the R-square value is about 0.33, and considered weak if R-square is about 0.19 (Lee and Chen, 2013). This result showed that all the R-square are considered substantial and moderate with the adjusted R-square value for attitude (ATT) being 0.549, CUI is 0.277, flow experience (FLOW) is 0.433, PEOU is 0.461, PU is 0.497, and Intention to WOM is 0.333.

Figure 2   Inner model calculation from smart-PLS
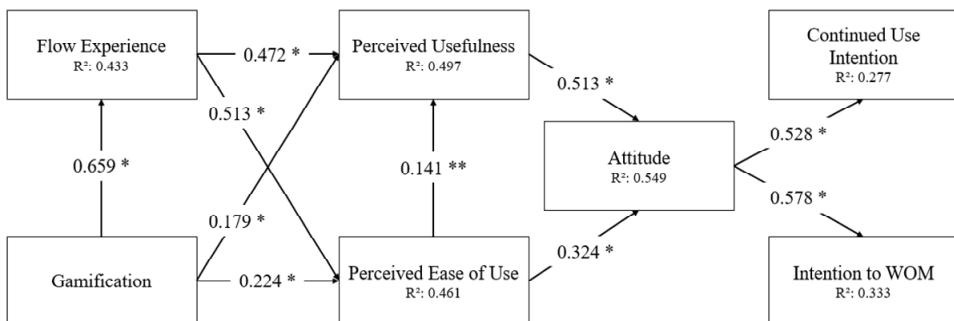
Note: *p-value <0.001; **p-value < 0.050.

4.3   Discussion

This research found that gamification becomes the predictor of flow experience, PEOU, and PU. A study on the effect of gamification on flow experience has been previously conducted by García-Jurado, et al. (2019) and Lee (2019). This study confirmed that Gamification has a significant influence on millennials and Generation X's flow experience when they use an e-commerce application. Since flow experience is one of the essential factors in an e-commerce platform, gamification will increase the enjoyable experience, which leads to the flow experience. Gamification also has a significant influence on the PEOU. This finding is supporting the previous study by Manganello and Pozzi (2019). The result means that there are elements in gamification that have convenience felt by the user when using it. Besides, gamification is also influencing PU. This finding is consistent with the previous study by Lee et al. (2017). It means the more PU is felt, and the more gamification is used. This could be coming from the badges, rank as well as the prize that users can get through the game that can be used or spent when they are using or shopping from the e-commerce apps. However, other statements are shown differently by García-Jurado et al., (2019). This may occur due to the differences in games provided in the E-commerce platform used (Amazon). Shopee can provide exciting games that are useful for shopping on its platform. For instance, by playing the games, Shopee users will get Shopee coin which is digital money used to reduce the total shopping amount when making payments when shopping at Shopee. Through this, it will lead to PU felt by the customer (Ulya, 2019).

A similar result to the previous study conducted by Sanchez-Franco (2010) stated that flow experience has a significant relationship to PEOU. This showed that when users get the experience of flow that is felt, then the intrinsic enjoyment, which is a preceding of PEOU, will also increase. Besides, this study also found that flow experience is influencing PU. A previous study conducted by Sarkar and Khare (2019) and Sanchez-Franco (2010) support this statement. If the flow has been obtained and felt, the benefits of Gamification are also easier to perceive.

Similar to studies conducted by Aydin (2015) and Rodrigues et al. (2016), the relationship between PEOU significantly influences the PU of this research. It means that once customers feel the ease of use in the gamification, they will also feel the usefulness in playing it. The study conducted by Aydin (2015) was in the digital social networking system, while Rodrigues et al.'s (2016) study was in the bank industry. This shows that gamification can be applied to many sectors to induce positive behaviour of users or customers. Furthermore, PEOU might also work hand in hand with other variables in shaping the PU, such as consumers' technology readiness (Lin et al., 2007), social influence, or social recognition (Vanduhe et al., 2020).

Attitude is the mediating factor in this study. Both PEOU and PU influence attitude. This statement showed that the gamification system is easy to use, so a positive attitude toward gamification will increase because there is no difficulty obtaining pleasure from the system so that they can see the value in gamification. Moreover, the more usefulness or benefit is realised and felt by customers, the higher favourable attitudes toward the behaviour of using gamification.

This study found that attitude shapes the customer's behavioural intention, such as the intention to continue using the e-commerce application and spread WOM. A similar result is also found in the study conducted by Hamari and Koivisto (2013, 2015). Suppose someone develops a positive attitude toward Gamification. In that case, they will

use it and lead to continued use to intention and spread the WOM of the application (Hamari and Koivisto, 2013; Hsu et al., 2017; Hamari and Koivisto, 2015). All in all, this study confirms that gamification is an effective strategy to create a post-adoption behaviour, which is the intention to continue using the app and recommend it to others. Gamification is found to create a flow of enjoyment and shape the perception of ease to use and users found it useful so that they have a positive attitude towards the e-commerce apps.

5 Conclusions and implications

This research aims to determine the relationship between the influence of e-commerce gamification on the loyalty program on an e-commerce application in Indonesia. There are ten hypotheses proposed in this study. This study found that gamification in the e-commerce platform is becoming one of the essential factors in forming customer attitudes. Gamification in the e-commerce application has been found to create PEOU and application usefulness. Gamification has a simple game with one goal: to get benefits from the e-commerce platform, such as points, vouchers, discounts, and other forms. Once customers found the benefit and easiness to use the application through gamification, they will build a positive attitude, and eventually, lead to CUI and Intention to spread WOM. Through gamification, the e-commerce platform can create a fun atmosphere and motivate players to spend their time in the game to give a good engagement and attitude towards it, encouraging consumer loyalty, leading to CUI to WOM (Reformansyah, 2020).

5.1 Theoretical and managerial implications

Theoretically, in this research, new findings were discovered. This study found variables affecting the continuing use of e-commerce apps and recommended it to others based on the context of gamification with e-commerce app use, using a quantitative approach and a study of related literature on gamification and consumer behaviour. By developing a gamification model in e-commerce, this study confirms that it creates a flow of experience which shape the perception of ease of use and usefulness of the application. Later, it leads to a positive attitude towards the e-commerce application and stimulates users to continue using the app and recommend it to others.

This study's results have three significant theoretical implications. Firstly, the current study uses the TAM technique to build an integrated model that investigates how these important characteristics influence continuous use intention for mobile applications in a specific e-commerce environment. This research provides an e-commerce app post-adoption model that may be used to guide empirical investigation of the relationship between major acceptance elements and post-adoption behaviour such as continuous usage intention and WOM spread. This study showed that CUI and Intention to WOM are becoming the strongest predictors of e-commerce gamification in the Shopee platform. A positive attitude toward gamification is also a factor that significantly influences CUI and Intention to WOM. Second, this study adds a relationship with flow experience to existing TAM research, which generally focuses on information technology users' perceptions and attitudes toward post-adoption behaviour. Finally, given the

context of an emerging market, our study adds to the literature on gamification in e-commerce apps.

E-commerce app developers will benefit from the findings of this study. It is recommended that e-commerce apps spend more time advertising and establishing appropriate reward schemes tailored specifically for those app users who are incentivised by the prize of gamification. Providing appealing and innovative games, as well as staying current with trends, are also essential. It is crucial to engage those reward-sensitive individuals since they have the potential to become loyal consumers because they use the app not only for shopping but also to play the game in the apps. E-commerce apps must effectively build a healthy and continuous relationship with these users to deliver value-added loyalty programs that will propel these users up the customer pyramid model (Zeithaml et al., 2001). App developers must design reward/incentive schemes that prioritise relationship-building above short-term monetary rewards. This necessitates a more in-depth understanding of users' needs and what they consider valuable. Customer engagement measures, such as delivering more responsive customer service via a dedicated web page or application, are also critical.

5.2   *Limitations and future research recommendations*

This research also has several limitations that could be developed more broadly by future research. The future researcher has the opportunity to expand the investigation to produce a broader significance in the gamification of e-commerce. Since this study combined variables from some previous studies' frameworks, namely, gamification, flow experience, PU, PEOU, attitude, CUI, and Intention to WOM. The researcher spots that several variables can be investigated. For instance, consumers' technology readiness (Lin et al., 2007), social influence, and social recognition (Vanduhe et al., 2020). The researcher also suggests other variables that could become the mediating variable between gamification and loyalty of customers, such as brand image (García-Jurado et al., 2019), and enjoyment (Rodrigues et al., 2016).

Another limitation is the respondents of this research. All of them live in Indonesia and this research focuses on one particular e-commerce app, Shopee. Therefore, future researchers can investigate this study in another emerging market to compare and get the bigger picture of gamification's use in shopping applications. The researcher also suggested researching using the same framework as this study but in other industries, for instance, on the green product website. Knowing that we have limited resources, green products are among the most important environmentally friendly products for our earth. Therefore, gamification can try to be applied to the green product website to increase the awareness of green products.

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