The Loyalty of Players in Online Streaming Games in Thailand

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Abstract

Purpose- The research aims to get a deeper insight into the factors that impact players' loyalty to online streaming games in Thailand. **Design/Methodology/Approach-** The methods include research design, sampling plan, Questionnaire design, pilot test, validity check for the questionnaire, Methods to gather the data and its procedures, and the statistical treatment of the data. The research also made a new conceptual framework based on 3 frameworks from previous related studies. **Findings -** The loyalty to online streaming games in Thailand has factors that impact it. Such factors or independent variables are gaming intensity, experience, avatar identification, and flow. Loyalty is the dependent variable. The results show that all the independent variables are significant and impact players' loyalty to online streaming games in Thailand. **Research Limitations/Implications** –The main limitation was the COVID-19 pandemic; as most people stay at home and practice social distancing, it was somewhat hard to collect data personally. The research on gaming topics is also quite new, so the researchers could not dig too deep into the case. **Originality/value-** The study is about the loyalty of players in online streaming games in Thailand and the important factors that impact it.

Keywords : player's loyalty, gaming intensity, gaming experience, avatar identification, flow, online streaming games

1. Introduction

1.1 Background of the study

Nowadays, more people are playing online games than ever before, and it has become a trend as one of the most popular activities to entertain themselves. The number of gamers is further increasing due to the recent COVID-19 pandemic causing people to stay at home with nothing to do. So, people started finding ways to entertain themselves, and one popular entertainment was gaming. Some of these users become interested in online games due to the streaming they have viewed, so the researchers have focused on the term online streaming games and how it will achieve the loyalty of players in online streaming games. The word streaming games in this research focuses on how the game can be streamed for a few reasons: that the game has long enough play time or takes a long time to finish the entire game from start to finish. If the game is longer, there is little fun streaming or watching the stream in the first place. Secondly, even if the player finishes the game, it can be played again using different means or aspects, such as avatars or ways which still makes the game interesting to play. This

way, the game can be streamed repeatedly, and the people who stream and watch will not get bored of the game easily. For example, streaming games such as DOTA 2 (Defense of the Ancients 2), LOL (League of Legends), Elden ring, PUPG (Player Unknown's Battlegrounds), Fortnite, etc.

The number of people who play games is increasing and has reached 2.7 billion, as stated (Statista, 2021). This makes the gaming sector exceptionally large and creates a strong business opportunity in online streaming games and uses these opportunities to turn them into reliable revenues as supported by (Teng, 2019). To get these opportunities and profit from this, the executive must think about improving customer loyalty or, in this case, online streaming game loyalty, which we describe as the motive to continue playing and suggest the online game to others. Loyalty is crucial in online streaming games or its carry-on intention element as this can up the sales of virtual items supported by Hamari et al. (2020). Sharma et al. (2021) stated that loyal users of the online game could buy gifts and give gifts to others. This is also another type of revenue for online games. Xu et al. (2021) also emphasized that loyal gamers may even stream the game online, which is another game-driven earnings stream. So, overall loyalty can make people engaged in spending behavior in e-commerce along with online games supported by (Hamari et al., 2017; Zheng et al., 2017).

In this study, the researchers collected data from gamers, both male and female, who play online streaming games in Thailand across internet café, gaming stores, and online gaming communities, as the respondents are most likely to have the same view towards streaming games in these locations than any other gamers. Most internet café, gaming stores, and online gaming communities have gamers that play games that fit the meaning of streaming games in this research. The researchers collected data from Thailand because Thailand's gaming industry is ranked 20th globally in-game revenue and second in Southeast Asia (National News Bureau of Thailand and Headline Editor, 2021). Thailand's gaming industry's gamers have been increasing lately due to the COVID–19 Pandemic lockdowns in 2020 which led to 100 million Thai Baht in gaming revenue from 32 million Thai gamers, and many Thai gamers are making earnings by playing online games directly or indirectly while the casual player is using more money on the online games and their products (Supakan et al., 2021). Furthermore, Supakan et al. (2021) and Komutanont et al. (2020) mention that 4 out of 10 Thais have said gaming is one of their top 5 entertainment. This also shows that gamer loyalty is increasing in Thailand due to the increase in spending for the games that they love and play, making the loyalty of players in the online streaming game in Thailand particularly important to research to take the opportunities which cause the gaming industry in Thailand which was already increasing day by day to increase even more. So, the gaming market has become big, and many opportunities are left untapped due to it being very new. To get these opportunities and get good profits, you will need to have gamer's loyalty towards the streaming online games. However, as of now, the market is very new, so not much research has been done on gamers' loyalty to gaming, which leads us to this research. Gamer's loyalty is important because it makes the gamers play the game frequently, which can lead to transactions being done for the game. They may spread the game's name to friends and family or stream them online. So, it has become important for game companies to learn how loyalty works and the factors that affect loyalty.

The result of this research will provide information about the loyalty of players in online streaming games in Thailand and answer what affects loyalty. The flow, avatar identification, gaming experience, and gaming intensity are the factors that affect loyalty, so it becomes crucial to understand the positive or negative impact these factors will have on the loyalty of players in online streaming games in Thailand. Therefore, this research becomes significant as the game companies can figure out how to earn the loyalty of gamers by learning what factors to focus on and perfect it so that they can take on the opportunities and get profits and not be on the losing side of the market with no useful information. Therefore, this research will help identify the impacts of flow, avatar identification, gaming experience, and intensity toward loyalty. Moreover, game companies could use the information in their marketing strategies to appeal to customers, creating even more value for them and resulting in loyalty.

The result of the study will be beneficial for the game developers of the game companies to understand better how to achieve the loyalty of the gamers in online streaming games in Thailand. They benefit by learning what affects the loyalty of the gamers in online streaming games since they will be able to develop the game focusing on factors such as gaming intensity, gaming experience, avatar identification, and flow. Making the developer's work more efficient and effective in creating a new game while cutting costs on the time, effort, and retries needed to make the games that gamers can be loyal towards.

Next, this study will benefit the marketers of gaming companies in Thailand. As marketers understand what creates loyalty in players in online streaming games, they can adjust their marketing. Hence, it reaches the values that the potential customers prioritize, making them buy and be loyal to the game itself.

Moreover, this is beneficial for the Management side of the gaming companies in Thailand. As the management knows what the gamers' loyalty is affected by, they can make more informed decisions about the game companies. They may be able to see which game ideas or projects are more likely to create profits because it better adheres to the factors that affect gamer loyalty, such as gaming intensity, gaming experience, avatar identification, and flow.

1.2 Objectives of the study

1) To determine the impact of gaming intensity on players' loyalty to online streaming games in Thailand.

2) To determine the impact of the gaming experience on the loyalty of players in online streaming games in Thailand.

3) To determine the impact of avatar identification on players' loyalty in the online streaming game in Thailand.

4) To determine the impact of flow on the loyalty of players in online streaming games in Thailand.

1.3 Research questions

The details below will represent the research questions of this study.

1) Does gaming intensity significantly impact players' loyalty to online streaming games in Thailand?

2) Does the gaming experience significantly impact players' loyalty to online streaming games in Thailand?

3) Does avatar identification significantly impact players' loyalty to online streaming games in Thailand?

4) Does flow significantly impact players' loyalty to online streaming games in Thailand?

2. Literature Review

2.1 Theories

2.1.1 Loyalty

Huang et al. (2017) and Homburg and Giering (2000) found that loyalty in e-commerce is comparable to repurchase and recommendation motives. Zheng et al. (2017) also stated that loyalty is the intention to repurchase. Loyalty also means a reason to play for a long time and tell others the motive supported by Huang et al. (2017) and Teng (2018). The same meaning of loyalty was also applied and used in mobile SNS providers (NG & Kwahk, 2010). Teng (2017b) and Hamari et al. (2020) also state that loyalty can be interpreted as the plan to play a game frequently or its continuance goal element. This interpretation was also accepted in the related literature of Huang and Hsieh (2011), Liao and Teng (2017), Teng (2013), and Teng and Chen (2014). Hsiao and Chen (2016) and Hsiao and Tang (2016) also found that loyalty is the to play a game frequently and recommend the game to others. Loyalty is important as loyal customers are less likely to be influenced by competitors and recommend the game to new customers instead (Teng & Chen, 2014).

2.1.2 Gaming intensity

Gaming Intensity refers to how often the gamer plays an online game in a certain time frame (Liao et al., 2016). Teng (2017a) also describes the relationship depth as how often a gamer plays the game. This gaming intensity characterizes the relationship between a game and the gamer in terms of frequency which was also applied to this research gaming intensity as it has the same meaning. This also means that the gamers playing frequently have the latest knowledge and understanding of the game and are familiar with the game.

2.1.3 Gaming experience

Gaming experience refers to the duration of the total time a gamer has played an online game (Liao et al., 2016). Teng (2017a) also describes the relationship length as the duration of the total time a gamer has played a game. This gaming experience characterizes the relationship between the game and the gamer in terms of period, which was also applied to this research gaming experience as it has the same meaning. This also means that gamers who have played the game long term have gotten themselves powerful items, upgraded their avatars, and given an edge when going for other games, which marks the gaming achievements (Yee, 2006).

2.1.4 Avatar identification

Avatar identification is defined as the users or the gamers thinking of their avatar as a different version of themselves, supported by Soutter and Hitchens (2016). Christy and Fox (2016) also support the meaning that avatars are a different version of gamers. Teng (2017b) also states that avatars are extra parts of gamers. Moon et al. (2013) emphasized that avatar identification is also defined as mental ownership of the character. Avatar identification

originates from the description of media characters which means how the person is in the character's shoes supported (Livingstone, 1998). Another study further defined this meaning as "increasing loss of self-awareness and its temporary replacement with heightened emotional and cognitive connections with a character'' (Cohen, 2001, p. 251). Li et al. (2013) also applied and used this meaning in another study. Gamers who feel identified with an avatar perceive the similarity with the characters, which makes them think about what their avatars would feel. For example, when the avatar fails, they also think of the failure, or when the avatar is hurt, the gamer also feels pain, supported by Li and Lwin (2016).

2.1.5 Flow

Mahnke et al. (2015) defined flow as the action of complete concentration and changes the gamer's sense of time. This is also agreed by Merhi (2016) and Wu et al. (2020), as it is described as a situation where a gamer is entangled in a specific task. It is also deep-seated happiness which is then also supported by (Teng, 2018; Tuunanen & Govindji, 2016; Liao & Teng, 2017; Huang et al., 2017). This was further confirmed by Merhi (2016) and Lee and Tsai (2010), as gamers become ignorant of what is happening around them and lose the sense of time and enjoyment in their minds all due to the reason being in the flow state. Agarwal and Karahanna (2000) stated that flow has a similar meaning as cognitive absorption. Flow convinces an approach of equitable skills; assignment demands and changes the way an individual perceives time or earthly disconnection as supported by (Mahnke et al., 2015; Agarwal & Karahanna, 2000). Hoffman and Novak (2009) and Wang and Hsu (2014) stated that flow could create a positive or satisfying sense, which brainwave technologies can confirm. This flow inspires more engagement with the related activity supported by Chang and Zhu (2012), Novak et al. (2000), and Zhou (2014). With all meanings, when the gamer is engrossed in the flow state, they do not want to get out of it but rather stay in that state (Hsiao & Tang, 2016).

2.2 Related literature review

2.2.1 Gaming intensity and loyalty

The frequent playing of a game within makes a routine or gaming intensity which can increase the playing of the game and motivate others to do the same in this case, it can be described as loyalty (Homburg & Giering, 2000; Huang et al., 2017; Talukder et al., 2019). Additionally, when gamers play a certain game repeatedly within a time, they must associate with the game, which allows them to know in depth about the game, and studies in the past have found similarly that such associations create a deeper understanding of the computer applications (Sciutti et al., 2018). This deeper understanding leads to more use of computer applications, also known as loyalty Goode (2018) and online games are common computer applications (Liao et al., 2021).

2.2.2 Gaming experience and loyalty

The total duration of the time the gamers play a specific game makes it so that the gamer knows the game in and out. Such associations in human-robot association literature create a mutual understanding between robots and humans (Sciutti et al., 2018). In the gaming context, such a deep understanding of the game caused by the long duration of playing the game creates a supporter of constant usage of the game, also known as loyalty (Goode, 2018).

2.2.3 Avatar identification and loyalty

Avatar identification for gamers the avatar is an extra part of the gamer (Moon et al., 2013), which sucks in the gamers. Li et al. (2013) described that driving gamers to play the game, while Banks and Bowman (2016), Sioni et al. (2017), Wu and Hsu (2018), and Looy et al. (2012) supported the concept of avatar that making players want to spend on virtual items. Moreover, gamers who want to engage with their avatars or extended self can only be done by playing the game, which further increases the play intention, also known as loyalty (Teng, 2017a). This relationship has been approved in similar studies with Soutter and Hitchens (2016) and Teng (2017b).

2.2.4 Flow and Loyalty

Flow theory states that flow makes the users want to use or be loyal (Liao & Teng, 2017). Moreover, this flow theory gives the gamers great enjoyment, making them return repeatedly to feel the flow is supported by the positive reinforcement theory (Skinner, 1969). Additionally, the continuous plan to play and feel the flow pattern represents loyalty (Mirvis, 1991; Teng & Chen, 2014). Loyalty or wanting to play the game repeatedly Teng and Chen (2014), has a predictor in relevant studies, which states that flow is one of them (Choi & Kim, 2004; Teng et al., 2012).

2.3 Conceptual Framework

This research used three theoretical models in total to create the conceptual framework. The first theoretical framework is how avatar attractiveness and customization impact online gamers' flow and loyalty. Liao et al. (2019) studied how avatar attractiveness and customization can affect the flow of online game users and loyalty. The result was that Avatar attractiveness and customization are positively linked to the game users' flow and loyalty. Moreover, the avatar identification and flow are critical to the process variables in the linkage.

The second theoretical framework is how avatars create identification and loyalty among online gamers. Teng (2019) studied finding the key concepts of how avatar identification and online gamer loyalty are linked. The result of the study was that irreplaceability in the team and avatar customization is related positively to unique avatar images. Avatar customization is positively correlated to positive avatar images. Furthermore, the avatar's physical attractiveness, along with the avatar's ability to achieve, is linked entirely to a positive avatar image. An avatar's unique and positive appearance is related positively to avatar identification and online gamer loyalty.

The third theoretical is a framework that does flow not enhance online gamer loyalty. Pham et al. (2021) studied some players who felt the flow did not show strong loyalty, so the researchers researched which players the flow does not increase online gamer loyalty and how gaming experience and intensity regulate the impact of flow on online gamer loyalty. The result of the study was that flow and gaming experience affect gamer loyalty positively. Gaming experience decreases the positive linkage between flow and gamer loyalty, but gaming intensity does not diminish the positive connection.

This study indicates the impact of independent variables such as gaming intensity, gaming experience, avatar identification, and flow on the dependent variable loyalty in online streaming games in Thailand. The conceptual framework is shown in Figure 1

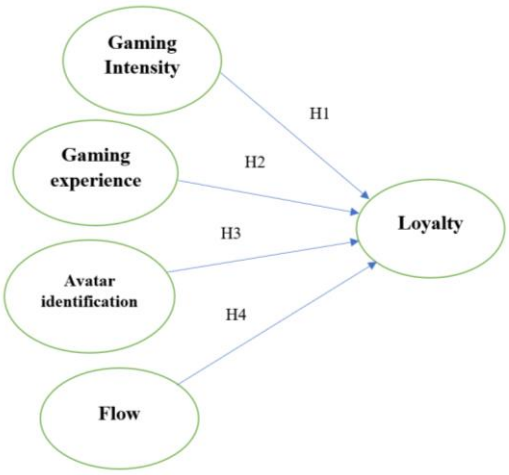

Figure 1. The conceptual framework

Based on the proposed conceptual framework, the researchers composted four hypotheses to determine players' loyalty to online streaming games in Thailand. The hypotheses are as follows:

Hypothesis 1 (H1o): Gaming intensity does not significantly impact players' loyalty to online streaming games in Thailand.

Hypothesis 1 (H1a): Gaming intensity significantly impacts players' loyalty to online streaming games in Thailand.

Hypothesis 2 (H2o): Gaming experience does not significantly impact players' loyalty to online streaming games in Thailand.

Hypothesis 2 (H2a): Gaming experience significantly impacts players' loyalty to online streaming games in Thailand.

Hypothesis 3 (H3o): Avatar identification does not significantly impact players' loyalty to online streaming games in Thailand.

Hypothesis 3 (H3a): Avatar identification significantly impacts players' loyalty to online streaming games in Thailand.

Hypothesis 4 (H4o): Flow does not significantly impact players' loyalty to online streaming games in Thailand.

Hypothesis 4 (H4a): Flow significantly impacts players' loyalty to online streaming games in Thailand.

3. Research Methodology

3.1 Research Design

This study aims to determine the impact of the independent variables of gaming intensity, gaming experience, avatar identification, and flow toward the loyalty of players in online streaming games in Thailand. This is for the gaming companies' game developers, marketing, and management to further increase their gamer's loyalty toward their games. This study is quantitative research and uses multiple types of analysis, such as Cronbach's Alpha, Multiple Linear Regression, and Descriptive research.

The questionnaires consist of three parts, a total of 30 items that relate to five variables of the research model, two items related to screening questions, twenty-one items that relate to the measuring variables, and seven items that are related to demographic information.

Firstly, Cronbach's Alpha (pilot test) was used to test the questionnaire and whether there was any uncertainty or confusion on the measurement items in the questionnaires. A group of 30 samples was used to conduct a pilot test to confirm the reliability of the questionnaires and to check if there was any confusion on the measurement items in the questionnaires. The researchers in this study used a five-point Likert scale to appraise the respondent's attitudes and agreement level with each variable. The number 1 on the Likert scale represents "Strongly Disagree," to 5 means "Strongly Agree" on a statistical level. Then the validity testing was done on the questionnaire using Cronbach's Alpha for 390 respondents.

Additionally, the researchers have used one multiple linear regression (MLR) to analyze the impact of gaming intensity, gaming experience, avatar identification, and flow on players' loyalty to online streaming games in Thailand.

Moreover, the study also applied another technique called secondary data. The secondary data came from reliable sources such as articles, journals, and previous research.

3.2 Target population, Sample Size, and Sampling procedure.

In this study, the target population is people who play streaming games in Thailand. According to Supakan et al. (2021), Thailand's gamer population as of 2020 is 32 million Thai gamers. However, the researchers could not find out the exact number of the target population of people in Thailand that plays streaming games. Therefore, the target population of the research will be used as unknown. Therefore, the researchers used the Cochran (1977) formula to calculate the sampling size of respondents because the procedure is used to calculate the sample size when the target population is unknown. To ascertain the required sample size of a novel population with a 95% confidence level, 50% standard deviation, and a 5% margin of error. The formula resulted in 385 respondents required. As for the sampling procedure, the researchers have used a non-probability sampling method to select the non-random selection based on the convenience and ease of collecting data. In the non-probability sampling method, the researchers have chosen two techniques which are convenience and snowball sampling. This method is suitable since the researchers can gather data much more easily based on the researchers' convenience. Additionally, the screening questions will screen the respondents based on the research objective.

4. Results of a pilot test, validity testing, descriptive analysis, and Hypotheses testing

4.1 Pilot test result

Table 1 shows Cronbach's Alpha with the statistic program. The result showed that the factors that impact the loyalty of players in the online streaming game in Thailand consists of 5 items ($\alpha = 0.820$). The result showed that the Cronbach's alpha for the loyalty of 4 items is 0.768, the four items of gaming intensity are 0.778, the four items of the gaming experience are 0.811, and the five items of avatar identification are 0.781. The four items of flow are 0.787. Sekaran and Bougie (2016) mention that the least required value to be accepted in Cronbach's Alpha is 0.6, and below that is poor. Furthermore, 0.60 to 0.70 is acceptable, and those above

0.80 are good. The level of Cronbach's Alpha test result for this study is shown in the table below.

Table 1. A result from Pilot Test – Cronbach's Alpha

n = 30

Variables	Cronbach's Alpha	Number of Items	Strength of Association
Loyalty	0.768	4	Acceptable
Gaming Intensity	0.778	4	Acceptable
Gaming Experience	0.811	4	Good
Avatar Identification	0.781	5	Acceptable
Flow	0.787	4	Acceptable

4.2 Validity Testing

The researchers decided to test the validity of the questionnaire using Cronbach's Alpha test of validity for 390 respondents. To ensure that there are any inconsistencies or errors of variables. Table 2 shows Cronbach's Alpha test that the researchers used to measure the extent of reliability and to find out how closely related the set of items was as a group using the SPSS program. The results demonstrate that the variables that impact players' loyalty in online streaming games in Thailand include five items (α=0.931). The results indicated that all the variables are reliable since they scored above 0.6, which is the least required to be reliable. The highest reliability is the variable that is the flow, which consists of four items at 0.942, followed by the variable avatar identification of five items at 0.915, the loyalty of four items at 0.907, the gaming experience of four items at 0.905 and lastly the gaming intensity of four items at 0.902.

Table 2 Cronbach's Alpha of overall measurement items

n = 390

Variables	Cronbach's Alpha	Number of Items	Strength of Association
Loyalty	0.907	4	Good
Gaming Intensity	0.902	4	Good
Gaming Experience	0.905	4	Good
Avatar Identification	0.915	5	Good
Flow	0.942	4	Good

4.3 Descriptive Analysis of Demographic Data

The researchers used the statistic program to do a descriptive analysis of the demographic information of the 390 respondents in Thailand who play streaming games. The demographic information includes gender, age, marital status, highest degree or level of education, current occupation, income per month, and lastly, currently playing streaming games. This information may explain the characteristics of the respondents by using descriptive analysis.

Table 3 demonstrates the frequency and percentage distribution in a sample size of 390 respondents as follows. **Gender:** Among all 390 respondents, the highest gender percentage is Male at 66.4%, numbering 259 respondents. Female then follows at 33.6%, numbering at 131 respondents. **Age:** Among all 390 respondents, the highest percentage of respondents are 16 – 20 years old at 34.4% numbering at 134 respondents which is followed by 26 – 30 years old at

30.0% numbering at 117 respondents, 21-25 years old at 25.9 % numbering at 101 respondents, 31- 35 years old at 6.7% numbering at 26 respondents, 36 - 40 years old at 2.6% numbering at 10 respondents and lastly over 40 years old at 0.5% numbering at 2 respondents. **Marital status:** Among all 390 respondents, most of the respondents are single at 77.2% numbering at 301 respondents which is followed by Married respondents at 19.2% numbering at 76 respondents, Complicated at 1.8% numbering at 7 respondents, and lastly Divorced respondents at 1.5% numbering at 6 respondents. **Highest degree or level of education:** Among all 390 respondents, most of the respondents have completed High school education at 49.2% which numbered at 192 respondents, which is followed by 47.4% respondents who have completed Bachelor's degree numbering at 185 respondents, 3.1% completed Master's degree numbering at 12 respondents and lastly 0.3% finished lower than high school numbering at 1 respondent. **Current occupation:** Among all 390 respondents, most of the respondents worked as an employee at 43.8% numbering at 171 respondents, which is followed by students at 37.7% numbering at 147 respondents, Freelance at 12.6% numbering at 49 respondents, Business owners at 5.1% numbering at 20 respondents and lastly public servants at 0.8% numbering at 3 respondents. **The income per month:** Out of all 390 respondents, most respondents earn 10,001 – 20,000 Baht at 56.9%, numbering 222 respondents, followed by 21.8 % of respondents who earn less than 10,000 Baht numbering 85 respondents, 15.6% earn 20,0001 – 30,000 Baht numbering at 61 respondents, two groups of income which both have the same percent and frequency each at 2.6% numbering at ten respondents which are 30,001 to 40,000 Baht and 40,001- 50,000 Baht. Lastly, 0.5% earn over 50,000 Baht, numbering two respondents. **Currently playing streaming game:** Out of all 390 respondents, most of the respondents are currently playing Player Unknown's Battle grounds at 34.9% numbering at 136 respondents, followed by 29.5% who play ROV numbering at 115 respondents, 15.9% who plays League of Legends numbering at 62 respondents, 12.1% who play Heroes of Newerth numbering at 47 respondents, 3.1% who plays Defense of the Ancients 2 numbering at 12 respondents, 0.8% who play Minecraft numbering at 3 respondents, 5 groups of streaming games who have the same percentage and frequency at 0.5% numbering at 2 respondents each which are Valorant, Fortnite, Genshin Impact, Counter strike Global offensive, Among Us, lastly 5 more groups which have the same percentage and frequency at 0.3% numbering at 1 respondent each which are Hades, Rise of Kingdoms, Fall Guys, Garena Free Fire and Overwatch.

Table 3 The analysis of demographic factors using the frequency and percentage

n=390

Demographic factors	Frequency	Percentage
Gender		
Male	259	66.4
Female	131	33.6
Total	**390**	**100**
Age		
16 -20 years old	134	34.3
21 – 25 years old	101	25.9
26 – 30 years old	117	30
31 – 35 years old	26	6.7

36 – 40 years old	10	2.6
Over 40 years old	2	0.5
Total	**390**	**100**
Marital Status		
Single	301	77.2
Married	76	19.5
Divorced	6	1.5
Complicated	7	1.8
Total	**390**	**100**
Highest degree or level of education		
Lower than high school	1	0.3
High school	192	49.2
Bachelor's Degree	185	47.4
Master's Degree	12	3.1
Total	**390**	**100**
Current Occupation		
Student	147	37.7
Employee	171	43.8
Business owner	20	5.1
Freelance	49	12.6
Public servant	3	0.8
Total	**390**	**100**
Income per month		
Less than 10,000 Baht	85	21.8
10,001 – 20,000 Baht	222	56.9
20,001 – 30,000 Baht	61	15.6
30,001 – 40,000 Baht	10	2.6
40,001 – 50,000 Baht	10	2.6
Over 50,000 Baht	2	0.5
Total	**390**	**100**
Current playing streaming game		
Defense of the Ancients 2	12	3.1
Player Unknown's Battlegrounds	136	34.8
Valorant	2	0.5
Hades	1	0.3
League of Legends	62	15.9
Rise of Kingdoms	1	0.3
Fortnite	2	0.5
Genshin Impact	2	0.5
Minecraft	3	0.8
Counter Strike Global Offensive	2	0.5
Fall Guys	1	0.3
ROV	115	29.4
Among Us	2	0.5
Heroes of Newerth	47	12
Garena Free Fire	1	0.3
Overwatch	1	0.3
Total	**390**	**100**

4.4 Descriptive Analysis with Mean and Standard Deviation

In this section, the Mean and Standard Deviation of variables, loyalty, gaming intensity, gaming experience, avatar identification, and flow, is summarized and analyzed accordingly.

Table 4 Loyalty (L) demonstrates the highest mean for the variable loyalty was "I am most likely to continue playing the streaming games in the future," which resulted in 3.91, while the lowest mean was "Streaming games are my first choice when considering what to play," which resulted in 3.69. As for the standard deviation, the highest was "I am most likely to continue playing the streaming games in the future," Which resulted in 0.934, while the lowest standard deviation was "When I speak about streaming games to anyone, I will speak positively about them" Which resulted in 0.862.

The Gaming Intensity (GI) from Table 4 demonstrated the highest mean for the variable Gaming Intensity was ": I play the streaming games frequently," which resulted in 3.81, while the lowest mean was "I feel content after playing the streaming game for 3 hours a day" which resulted in 3.32. As for the standard deviation, the highest was "I play the streaming games frequently," which resulted in 1.01. In contrast, the lowest standard deviation was "My frequency in playing streaming games has increased over time," which resulted in 0.895.

Under the Gaming Experience (GE) from Table 4 demonstrated the highest mean for the variable Gaming Experience was "I have played streaming games for more than two years," which resulted in 3.89, while the lowest mean was "I feel that I know everything there is to know about the streaming games that I play" which resulted in 3.61. As for the standard deviation, the highest was "I have played streaming games for more than two years," which resulted in 1.112, while the lowest standard deviation was "I have built a long relationship with the streaming game that I play," which resulted in 0.906.

Avatar Identification (AI) demonstrated the highest mean for the variable Avatar Identification was "When my avatar accomplishes something, I feel that I also accomplish the same thing with them," which resulted in 3.87, while the lowest mean was "I am willing to spend money for my avatar items" which resulted in 3.4. As for the standard deviation, the highest was "I am willing to spend money for my avatar items," which resulted in 1.104. In contrast, the lowest standard deviation was "The avatar that I play with represents a part of myself when I play the streaming game," which resulted in 0.856.

About Flow (F) demonstrated the highest mean for the variable flow was "Whenever I play streaming games, I often enjoy playing it," which resulted in 4.17, while the lowest mean was "When playing streaming games, I often lose the sense of time," which resulted in 3.03. As for the standard deviation, the highest was "When playing streaming games, I often lose the sense of time," which resulted in 1.194, while the lowest standard deviation was "Whenever I play streaming games, I often enjoy playing it," which resulted in 0.801.

Table 4 The result of the Mean and Standard Deviation of each variable

	N	Minimum	Maximum	Mean	Standard Deviation
Loyalty (L)					
L1: I am most likely to continue playing streaming games in the future.	390	1	5	3.91	0.934

L2: I am willing to recommend the streaming games to any of my interested friends.	390	1	5	3.77	0.867
L3: Streaming games are my first choice when considering what to play.	390	1	5	3.69	0.919
L4: When I speak about streaming games to anyone, I will speak positively about them.	390	2	5	3.76	0.862
Gaming Intensity (GI)					
GI1: I feel content after playing the streaming game for 3 hours a day.	390	1	5	3.32	0.999
GI2: I play streaming games frequently.	390	1	5	3.81	1.01
GI3: My frequency of playing streaming games has increased over time.	390	1	5	3.6	0.895
GI4: I feel that I am up to date on the information related to the streaming game due to playing it frequently.	390	1	5	3.68	0.914
Gaming Experience (GE)					
GE1: I have played streaming games for more than 2 years.	390	1	5	3.89	1.112
GE2: I have built a long relationship with the streaming game I play.	390	1	5	3.68	0.906
GE3: I feel that I know everything there is to know about the streaming games that I play.	390	1	5	3.61	0.916
GE4: I have become skillful in the game due to long playtime with the game.	390	1	5	3.71	0.93
Avatar Identification (AI)					
AI1: I feel I own the avatar I play in the steaming game.	390	1	5	3.69	0.917
AI2: The avatar I play with is exceedingly important to me.	390	1	5	3.62	0.926
AI3: I am willing to spend money on my avatar items.	390	1	5	3.4	1.104
AI4: The avatar I play with represents a part of myself when I play the streaming game.	390	1	5	3.74	0.856
AI5: When my avatar accomplishes something, I achieve the same thing with them.	390	2	5	3.87	0.903
Flow (F)					
F1: When playing streaming games, I often lose the sense of time.	390	1	5	3.03	1.194
F2: When playing a streaming game, I feel I am also in the game's environment.	390	1	5	3.81	0.864
F3: Whenever I play streaming games, I often enjoy playing them.	390	1	5	4.17	0.801
F4: I come back often to play the streaming game to feel the enjoyment I previously had in my last session.	390	1	5	3.86	0.923

4.5 Hypotheses Testing Results

4.4.1 Summary of Multiple Linear Regression

To test the hypotheses of the factors impacting loyalty, the researchers have used multiple linear regression as a statistical analysis tool. Furthermore, to find out if there are unnecessary variables that should be removed, multicollinearity should be computed alongside the multiple linear regression, in which the Variance Inflation Factor (VIF) should be less than or equal to 5 to remove any overlapping variables, as suggested by Akinwande et al. (2015). Additionally, with the R-square (R^2) value, we can understand the part of the variation in the dependent variable established on the independent variable.

The researchers used a multiple linear regression statistical analysis tool to determine the level of influence between gaming intensity, gaming experience, avatar identification, and flow toward loyalty towards online streaming games in Thailand.

Table 5 shows that a multiple linear regression was used to determine whether gaming intensity, gaming experience, avatar identification, and flow significantly predicted loyalty. The results show that from hypotheses 1, 2, 3, and 4, all independent variables that dictate loyalty had less than 5 in VIF. This VIF indicates that there is no overlapping and no problems or multicollinearity. The result is as follows gaming intensity is 4.182, the gaming experience is 4.353, avatar identification is 3.032, and flow is 1.819. Furthermore, the R-Square was 0.759 at a 95% of confidence level. This means that the independent variables (gaming intensity, gaming experience, avatar identification, and flow) can explain the dependent variable(loyalty) by approximately 75.9%. The results also show that $F(4,385) = 302.598$ and $p < 0.05$ are the 2 predictors that can be accounted for 75.9% of the variance in loyalty. Looking more into the individual contributions of each predictor, the results show gaming intensity as $\beta = 0.46$, $p<0.05$, gaming experience as $\beta = 0.242$, $p<0.05$, avatar identification as $\beta=0.166$, $p<0.05$, flow as $\beta=0.078$, $p<0.05$ and are positively significant to loyalty.

Statistical Hypothesis 1

H1o: Gaming intensity does not significantly impact players' loyalty to online streaming games in Thailand.

H1a: Gaming intensity significantly impacts players' loyalty to online streaming games in Thailand.

Table 5 shows that the significant level was at <0.001, less than 0.05. That means that the null hypothesis was rejected, and as a result, it can be summarized that loyalty was impacted by gaming intensity. Additionally, gaming intensity has a standard coefficient of 0.46, which can be interpreted as if gaming intensity increases by 1%, loyalty can be raised by 46%.

Statistical Hypothesis 2

H2o: Gaming experience does not significantly impact players' loyalty to online streaming games in Thailand.

H2a: Gaming experience significantly impacts players' loyalty to online streaming games in Thailand.

Table 5 shows that the significant level was at <0.001, less than 0.05. That means the null hypothesis was rejected, and as a result, it can be summarized that the gaming experience significantly impacted loyalty. Additionally, the gaming experience has a standard coefficient of 0.242, which can be interpreted as if the gaming experience increases by 1%, the loyalty can be raised by 24.2%.

Statistical Hypothesis 3

H3o: Avatar identification does not significantly impact players' loyalty to online streaming games in Thailand.

H3a: Avatar identification significantly impacts players' loyalty to online streaming games in Thailand.

Table 5 shows that the significant level was at <0.001, less than 0.05. That means that the null hypothesis was rejected, and as a result, it can be summarized that loyalty was impacted by avatar identification. Additionally, avatar identification has a standard coefficient of 0.166, which can be interpreted as if avatar identification increases by 1%, loyalty can be raised by 16.6%.

Statistical Hypothesis 4

H4o: Flow does not significantly impact players' loyalty to online streaming games in Thailand.

H4a: Flow significantly impacts players' loyalty to online streaming games in Thailand.

Table 5 shows that the significant level was at <0.022, less than 0.05. That means the null hypothesis was rejected, and as a result, it can be summarized that flow impacted loyalty. Additionally, the flow has a standard coefficient of 0.078, which can be interpreted that if flow increases by 1%, loyalty can be raised by 7.8%.

Table 5 Summary of Multiple Linear Regression Analysis for Hypotheses 1,2,3 and 4

Variables	B	SE B	β	t	Sig.	VIF
(Constant)	0.362	0.134		2.709	0.007	
Gaming intensity	0.445	0.05	0.46	8.985	<.001	4.182
Gaming experience	0.22	0.047	0.242	4.631	<.001	4.353
Avatar identification	0.162	0.043	0.166	3.799	<.001	3.032
Flow	0.11	0.048	0.078	2.297	0.022	1.819
R Square	0.759					
Adjusted R Square	0.756					
F	302.598					

Note: *p<0.05. Dependent variable = Loyalty

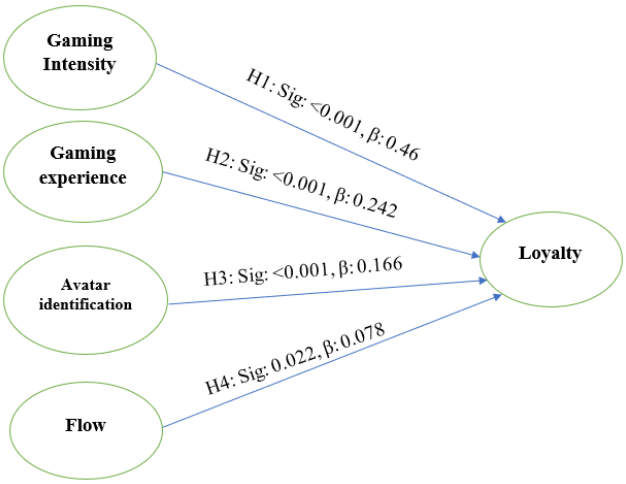

Figure 2. The results of the structural model

5. Conclusion and Recommendation

5.1 Summary of the study

The study is based on the research objectives to determine the impact of the variables, gaming intensity, gaming experience, avatar identification, and flow, on loyalty in streaming games.

The hypotheses testing result showed that all 4 independent variables had their null hypothesis rejected, and all four were statistically significant. The gaming intensity is the most important that impacts loyalty. The result of the hypotheses ranking is summarized in table 6 below.

Table 6 Summary results of the hypotheses testing

Hypotheses	Significant value	Standardized coefficient	Result
H1o: Gaming intensity does not significantly impact players' loyalty to online streaming games in Thailand.	<0.001	0.46	Rejected
H2o: Gaming experience does not significantly impact players' loyalty to online streaming games in Thailand.	<0.001	0.242	Rejected
H3o: Avatar identification does not significantly impact players' loyalty to online streaming games in Thailand.	<0.001	0.166	Rejected
H4o: Flow does not significantly impact players' loyalty to online streaming games in Thailand.	0.022	0.078	Rejected

Note: P-value <0.05

Table 7 shows the ranking of the independent variables that impact loyalty from most significant to least significant. The independent variable and dependent variable impact are measured using the beta. The results show that gaming intensity at 0.46 has the strongest impact on loyalty which can be interpreted that if 1 unit of gaming intensity increases, loyalty will be increased by 0.46. This is followed by gaming intensity, in which if 1 unit of gaming experience increases, then loyalty will also increase by 0.242. Thirdly by avatar identification in which, if 1 unit of avatar identification increases, then loyalty will also increase by 0.166, and the least factor that impacts loyalty at fourth place is flow, in which if 1 unit of flow increases, then loyalty will also increase by 0.078.

Table 7 Strengths of factors that impact the variable loyalty

Rank	Independent Variable	Beta
1st	Gaming intensity	0.46
2nd	Gaming experience	0.242
3rd	Avatar identification	0.166
4th	Flow	0.078

5.2 Discussion and conclusion

The testing of the hypotheses shows that there is a total of four factors that impacts loyalty significantly.

Gaming intensity and loyalty

This research finding illustrated the positive significant impact of gaming intensity on loyalty. The value of such significance between gaming intensity and loyalty is <0.001. This

indicates that the gaming companies should consider on gaming intensity aspect in trying to get the loyalty of players in online streaming games in Thailand. This agrees with Homburg and Giering (2000), Huang et al. (2017), and Talukder et al. (2019). They stated that frequent playing of a game creates a routine or gaming intensity which can increase the playing of the game and motivate others to do the same in this case, it can be described as loyalty.

Using the descriptive analysis of the four questions related to gaming intensity from the questionnaire the researchers had collected, the statistical data results show that the mean of gaming intensity is 3.60. In such questions, the lowest mean is 3.32, and the question is "I feel content after playing the streaming game for 3 hours a day". The results indicate that the gamers are quite close to neutral, and some agree, meaning they are only somewhat content with 3 hours of game time per day. So, game companies should focus on letting players feel content after 3 hours of gameplay time each day. For example, the way can be making the game rewarding to play daily, like giving the players who come to play daily for 3 hours game items, game currency, game skins, etc.

Gaming experience and loyalty

The research finding illustrated the significant positive impact of gaming experience on loyalty at a value of <0.001. This finding shows that gaming companies need to monitor the gaming experience and get players' loyalty in online streaming games in Thailand. This agrees with Sciutti et al. (2018) and Goode (2018), these authors stated that the total duration of the time the gamers play a specific game makes it so that the gamer knows the game in and out. Such a deep understanding of the game caused by the long duration of playing the game creates a supporter of constant usage of the game, also known as loyalty.

Using the descriptive analysis of the four questions related to the gaming experience that came from the questionnaire that the researchers had collected, the statistical data result shows that the mean of the gaming experience is 3.72. In these questions, the lowest mean score at 3.61 is "I feel that I know everything there is to know about the streaming games that I play." The result indicates that the gamers are close to agreeing and are a bit neutral, meaning that they don't know as much as gameplayers would like to know in the streaming game they play. So, gaming companies need to focus on letting gamers learn more about the streaming games they play for the duration of their overall playtime. For example, Game companies can release more information on the game mechanics or give detailed tutorials for players who want to learn more.

Avatar identification and loyalty

The research finding illustrated the positive significant impact of avatar identification on loyalty at a value of <0.001. This shows that the gaming companies need to focus on the avatar they create that can identify with the players to get players' loyalty in online streaming games in Thailand. This agrees with Teng (2017a), Soutter and Hitchens (2016), and Teng (2017b), who stated that gamers who want to engage with their avatars or extended self could only be done by playing the game, so this further increases the play intention also known as loyalty. Moreover, Moon et al. (2013), Li et al. (2013), Banks and Bowman (2016), Sioni et al. (2017), and Looy et al. (2012) also agree with this statement that avatar identification for gamers that avatar is extra parts of the gamer, which sucks in the gamers and drive the gamers to play the game.

Using the descriptive analysis of the five questions related to avatar identification from the questionnaire the researchers had collected, the statistical data result shows that the mean of avatar identification is 3.66. In these questions, the lowest mean score at 3.40 is "I am willing to spend money for my avatar items." The result indicates that the gamers are close to neutral and are a bit towards agreeing which means that the gamers are willing to spend some money on the avatar items. So, gaming companies need to focus on increasing the rate the player is more inclined to spend on avatar items. For example, game companies can make extremely nice avatar items that fit nicely with the avatar characteristics. Players see an extended part of their selves equipped with a nice design and fit to the features they may want to buy as if they are shopping the clothes or items for themselves.

Flow and Loyalty

The research finding illustrated the significant positive impact of flow on loyalty at a value of 0.022. This finding shows that the gaming companies cannot neglect the aspect of the flow in their games to get players' loyalty in online streaming games in Thailand. This result also aligns with the study by Skinner (1969), Mirvis (1991), and Teng and Chen (2014) illustrated that the flow theory of flow gives great enjoyment to gamers. Moreover, the flow makes gamers repeatedly return to feel the flow is supported by the positive reinforcement theory and the pattern of the continuous plan to play, and the flow represents loyalty. Besides, Liao and Teng (2017), Choi and Kim (2004), and Teng et al. (2012) also stated that loyalty or wanting to play the game repeatedly has a predictor in relevant studies, which says that flow is one of them.

Using the descriptive analysis of the four questions related to the flow from the questionnaire the researchers had collected, the statistical data result shows that the mean flow is 3.72. In these questions, the lowest mean at 3.03 is "When playing streaming games, I often lose the sense of time" the result indicates that the gamers are close to neutral, meaning that gamers may or may not lose the sense of time when playing streaming games. So, the gaming companies need to focus on making the players enjoy the game and feel the flow so strongly that they lose time playing streaming games. For example, the game can have events or content that engage the users and requires a bit of focus. That is why the players engage in the game, have a state of flow, and lose time while playing such events or content.

5.3 Recommendation

Based on the conclusion, the results of this research reveal that loyalty is affected by the variables from the conceptual framework, gaming intensity, gaming experience, avatar identification, and flow. The gaming intensity is the strongest significant impact on loyalty, followed by gaming experience, avatar identification, and least considerable being flow, respectively.

Hence, game companies should focus on encouraging gaming intensity as it has the highest impact on loyalty. The game developers may create games that allow frequent playing and are rewarding to play frequently. For example, the game may provide players who log in daily with rewards such as game items or currencies. After a continuous login for a week, you get legendary items, a large sum of game currency, and so on for a month. Or the game may have a weekly random boss that comes once a week and needs preparation to fight that boss, so the players may log in more to fight the boss, get good rewards, and improve their skills.

The marketing of game companies may also participate by promoting and informing the player base and potential players about the tips that players get for frequently playing the game which may invite new players to try the game and existing players to be more loyal. The management of the game companies can also make informed decisions and emphasize game projects that allow gaming intensity to be achieved in the player base.

The gaming experience should be considered as it is second in the significant rank. The game developers of the game companies can provide content that can only be achieved when playing the game for a long time. For example, the game may have the last boss with a rich story that requires a lot of equipment and skill to defeat to get enormous rewards, or the game may have a ranking system in terms of players vs. players' content to reach a higher level of skills in gaming. This type of content can only be achieved by long overall playtime and the skills developed in those playtimes, enabling loyalty. The marketing in the game companies may advertise the game as extremely cool and having a story-rich last boss that needs to be achieved, so players may want to play the game too long to reach that state or spark the competitiveness in players vs. players by advertising top players that play competitively. The management can also plan to provide support in deciding how to enrich those gaming experiences by weighing which contents are nicer and preparing for competitions that require a lot of skills.

Avatar identification should be in consideration as it is the third in the significant rank towards loyalty. Game developers of game companies can develop avatars that adhere to most of the player's personalities and characteristics. Marketing can also help by doing market analysis on the gamers that play their games and what they value the most in avatars or the characters and features of the players and telling it to the developers. The developers can develop similar avatars to the description, which can increase loyalty in the game because players want to interact with the avatars that the players like. The management can support these operations by making the process smoother and quicker and making informed decisions faster because they know that avatar identification is a significant factor in loyalty and is important too.

Lastly, flow is also significant but is the fourth in the substantial rank, so it should be addressed. Game developers of game companies can make game contents that need engagement from the players so that they feel that they are enjoying the game and feeling the flow. For example, the game may have a story that the player needs to follow, but they make their own decisions, and these decisions will affect the outcome of the game. So that means you cannot mindlessly play the game and require some engagement from the players. Even in players vs. players, some stories can bring attention to playing the game. For example, the map where you fight with players has some level in the game and the result of which players win changes the outcome. The marketing of gaming companies can advertise such aspects of the story to make the players feel enjoyment in the game as the players know that they are part of the story. For example: making a short film about the game with nice visuals can increase the enjoyment of playing the game. The management can help plan the deadlines and think about the ways to achieve such objectives of flow feeling in a game. With the information, they can also create more realistic goals for the company.

5.4 Further study

The research only focuses on four variables, gaming intensity, gaming experience, avatar identification, and flow, which impact the loyalty of players in online streaming games in Thailand due to the limitation of time and the COVID-19 pandemic. The research on gaming is a new context. For further study, to understand more deeply about the loyalty of players in online streaming games in Thailand. Further study could also expand on the factors that may impact the independent variables to enrich the understanding players' loyalty in online streaming games in Thailand. Further study could also be conducted in different countries or focus on a specific city such as Bangkok. This may lead to better research and other outcomes.

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