Live Streaming Contents Influencing Game Playing Behavior Among Thailand Gamers

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Abstract

This paper studies online game engagement in Thailand gaming communities. 'Planned Behavior' is the theory used in this study and it explains factors in order to determine the sustainability of the online gaming business. The theoretical research model of the paper focuses on flow experience, human-computer interaction, social interaction, and perceived enjoyment. A quantitative method has been used to measure the implications and data was collected from 800 participants' online gamer via streaming tournament. The key findings show that the conveyed player attitudes and the flow experience have a positive influence on players' continued intention to play an online game via Live-streaming. Hence Live-streaming is also an online game community connector and can be used as an indicator on the engagement of a sustainable game industry.

Keywords: Online games, social interaction, theory of planned behavior (TPB).

1 Introduction

Digital content is created and distributed widely through different distribution platforms such as movies, music, and games [1]. The online gaming market is a progressively well-known recreational and worldwide movement with the quantity of players increasing quickly [2]. In particular, online games have become salient among online communities, and are viewed as a diversion network since they permit gamers to engage in and enjoy virtual reality. In the network of online games, users are able to perform a special role, interact socially, and exchange information [3]. For example, Weustink [4], presenting an interesting report about the proportion of online gamers in Southeast Asia. Most of Southeast Asia's online gaming populace is concentrated in urban centers. The mobile stage, by a critical edge, is the most played-on stage in the area. Additionally, consoles and PCs are mainstream and most of the online populace play on them: 80% of games are on mobiles; 69% of games are on PCs; 57% of games are on consoles. Narratives of the prevailing literature may propose that the male portion of gamers in this group is outstanding. Figure 1 depicts a much more even gender divide, particularly on mobile devices.

Presently, the scholastic exploration of games has developed for supporting the gaming industries rather than media outlets such as motion pictures, TV, or music [5]. This paper aims to explore the behavior of gamers in Thailand. This exploration looks at the theory of planned behavior, flow
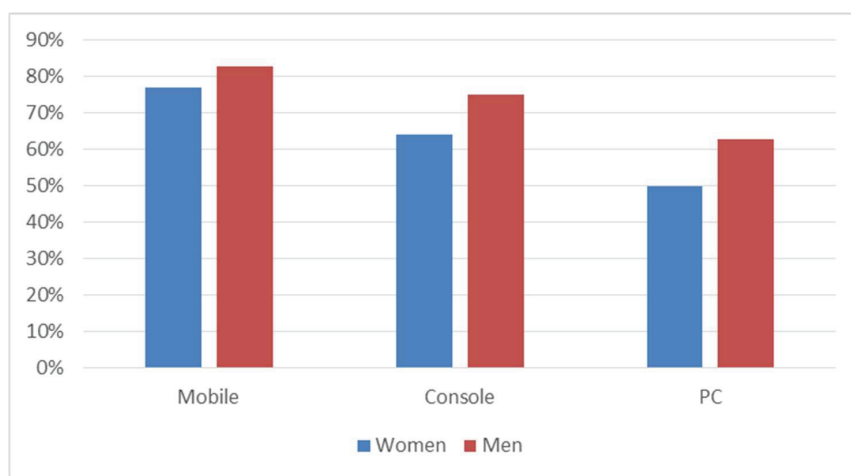

Figure 1 The sharing of gaming online in metropolitan populace in Southeast Asia.

experience, interaction, and as well as perceived enjoyment of gamers in light of use in reality by calculating the frequency of the players' playing time. In addition, by providing hypothetical establishments and observational evidence, an examination model has been developed for widening the understanding of the factors that influence people's willingness to play.

2 Related Work

There are at least four theories prominently grounding this research, i.e.: the live streaming community, online gaming culture, the theory of planned behavior (TPB), and adoption of online gaming using TPB.

2.1 Live Streaming Contents

Live streaming video platforms, such as Twitch or Mixer, allow for the user to screen-share or broadcast a video of the game-play to the viewer [6]. Most of the shared content is either a video of the online game being played, such as a sports game, or a talent show [7]. Presently, due to the sharing of content in this way, playing games is no longer a form of individual entertainment. Live streaming video platforms offer users a place for them to upload their performances, and offer viewers various types of channels for recreation. In contrast to past spilling administrations, for example, television and YouTube, live streaming platforms offer real time continuous human interaction between streamers and viewers, encouraging a higher capacity to interact with one another digitally [8]. Live-streaming and video marketing are getting complete consideration regarding the promotion of this type of business as a rising pattern in digital strategy, especially among associations with millennial customers and spending on video publicizing. By 2019, video advertising is expected to be worth more than $14 billion a year [9]. There are many factors that encourage live streaming of the most popular videos-creating an ecosystem within the online gaming community [10]. Regarding this ecosystem, contemporarily, the number of people using a live streaming video platform is rapidly increasing.

2.2 Online Games Culture: A Case Study in Thailand

A statistical digital report showed that Thailand had 52 million internet users in January, 2020. Moreover, the number of Thailand's internet users surged by 1 million (+2%) between 2019 and 2020 [11]. Thereby, many more people have started using the internet for leisure purposes such as

Table 1   Thailand's top 10 online games

Name	Genre	Developer	eSport Tournament
Free Fire	Action	Garena Online	Yes
Speed drifters	Racing	Tencent	Yes
Realm of Valor	Action	Tencent	Yes
PUBG MOBILE	Action	Tencent	Yes
Subway Surfers	Action	Sybo	–
Paper.io 2	Arcade	Voodoo	–
Tiles Hop : EDM Rush	Arcade	Amanotes	–
Stack Ball	Arcade	Azur Interactive Games	–
Mobile Legends: Bang Bang	Action	Moonton	Yes
Color Bump 3D	Aracde	Good Job Games	–

Source: https://sensortower.com/ios/rankings/top/iphone/thailand/games.

watching videos and playing games. Guilherme determined which markets in the area of Southeast Asia (SEA) contributed most to incomes of more than 1,200 distinctive online game distributors – a mix of partner information from Priori and his organization's income. In light of this study, Singapore is the most objective marketplace for 31% of the businesses, with Thailand coming in second at 27%. The least interesting countries were Vietnam and the Philippines – netting just 7% of the 1,200 organizations in the breakdown. The top ten distributor rankings in Singapore and Thailand are vastly different (by all out incomes of game). Across all rankings, just two organizations are available: IGG and Net marble. The rating of Indonesia is very similar to that of Thailand, with six distributors showing up in the two rankings. This reflects how unique and varied each market's aspects are. This makes focusing on applicable markets inside Southeast Asia imperative for any firm aiming to expand their presence in the region [12]. The top 10 online games in Thailand according to the website "sensortower.com" are depicted in Table 1.

2.3 Theory of Planned Behavior

Many theories focus on the significance of relational impact on an individual's selection of a product. Ajzen [13] proposed the idea of planned behavior, while Katz [14] and Lazarsfeld et al. [15] proposed the two-step flow theory. In this scenario, the study's model utilizes the TPB as its foundation. The TPB is often considered to be an augmentation of the theory of reasoned action (TRA), which was established to address various TRA limitations [16]. According to the idea of planned behavior, the anticipation of goal is dependent on three distinct procedures: (1) attitude (ATT), (2) subjective norm

(SN), and (3) perceived behavior control (PCB). Attitude (ATT) represents how people understand and accept things, and is linked to their aspirations for behavior. While subjective norm (SN) associates with the help given or not given by a person's family member, friends or noteworthy people are also seen as impacting the individual's conduct. Perceived behavior control (PCB) alludes to a person's sentiments about the capacity to execute designed behavior. In general, the theory of planned behavior (TPB) clarifies that When a person considers a behavior to be fun and beneficial, he or she welcomes encouragement and motivation from those who are already doing it. Thus, the individual makes an assumption about his or her own competence to do the assignment. There is a more solid expectation to carry out that work at that point, which motivates real execution of that task [17].

2.4 Online Games' Adoption using TPB

Albeit numerous pieces of research allude to the rare occurrence of TPB in various IS adoptions, not many specialists really utilize the TPB in the adoption of online games. By including interaction, flow experience, and reported enjoyment into his study approach, Lee [18] explains players' behavioral intentions using a quantitative assessment paradigm. He noticed a fluctuation of 75% in the expectancy of playing online games. In addition, his findings revealed a strong, important link between flow experience with gaming attitude and intention. Aside from this, he endeavored to coordinate the innovation acknowledgement model of Davis [19, 20] in order to gauge the intention of the gamer to continue playing online games. In addition, Lee and Tsai found strong positive impacts among relationships on continuation intention, with R2 = 0.700, based on the data of 678 respondents. Furthermore, Hong et al. [21] added parenting style and self-worth to the TPB model. An important relationship was found in this study between parenting style, self-worth, and players' intention of playing online games. Some researchers such as Kartas and Goode [22] adapted the TPB to look into the role of programming robbery in the choice to adopt computer game comfort. They discovered no significant association between fear of obsolescence and perceived deterrent on behaviour control among their hypotheses. They also examined the behavior intention to play video games as part of their study. As the literature mentioned that the majority of research that has used TPB and online games have focused on the deliberate behavior of playing games. In this paper, the researcher examines the real behavior of online game play in its participants. As Brown et al. [23] clarified: with commanded innovation,

whether they require it or not, users must use the framework. They should utilize it in conjunction with deliberate technology, such as in online games. "Real use" is an essential achievement component as well [24].

3 Methodology

3.1 Sampling Plan and Data Collection

This study adopted an online survey to ensure respondents' anonymity and overcome time and location restrictions. The online questionnaire was created via Google from. The link to the poll was sent across online game groups in Thailand to gather a pool of respondents that was as representative of the broader population of online gamers as feasible. All structured questionnaires were derived from the literature. An online questionnaire was made by online form on Google documents to online gamer communities in Thailand. The main survey had 40 responses. The questionnaire was organized into nine sections to precisely address the study's seven hypotheses. The first sections comprise four items on 'human computer interaction'; four items on the 'social interaction'; four items on 'subjective norm'; three items on 'perceived behavior control'; four items on 'Perceived enjoyment; ten items on 'Attitude'; four items on 'Flow experience' and four items on 'Perceived fee'. To access all relevant dimensions of the concept, all questions were evaluated using a five-point Likert scale ranging from 1 for strongly disagree to 5 for strongly agree. There were 56 respondents who clearly were not thinking about their replies (i.e., providing the same rating for all questions), therefore they were deleted, leaving 800 questionnaires for study. AMOS 22.0 was used to perform SEM analysis to prove the proposed hypothetical model and model fit.

3.2 Variables Description

This study employs eight variables. Flow experience (FE) clarifies the flow as the boost that draws the players in with complete association with the game, intrigue and fixation, alongside an enjoyable experience [3]. Perceived enjoyment (PE) is explained as the extent to which the movement of employing a certain system is perceived to be joyful in and of itself, independent of any performance results that occur as a result of the system's usage [25]. Human computer interaction (HCI) was defined as the point of contact between the application (systems, applications, and games), and the end user, which allows the user and the PC to participate with one

another [26]. Social interaction (SI) related with past studies that on the off-chance that the online gaming platform is regarded as a social gathering place, at that point it aids players in making social bonds [21]. Actual use (AU) signifies the intention to put into practice and accept the technology that has been created [20]. The subjective norm is defined as a social influence that encourages others to engage in a specific conduct. Subjective norms play an important role in promoting users' purposefulness in online communities; subjective norms can really stimulate other persons to contribute in communities [3]. Perceived behavior control (PBC) describes a person's control conviction centered on activity. Wang's past discoveries [27] clarified the intervening part of advancement trial ability and deliberate to play online recreations. According to Ajzen, an individual's attitude (ATT) should be the major focus of an individual's consideration for assessing any conduct, while subjective norm (SN) and perceived behavior control (PBC) should be the foundation of any individual's aim [13, 16]. From the variables created in the literature review, this research holds three endogenous variables (FE, ATT, and AU), while the other five are exogenous. This study posits the following hypothesis:

Hypothesis 1: SI is positively related to FE.
Hypothesis 2: HCI is positively related to FE.
Hypothesis 3: FE is positively related to ATT.
Hypothesis 4: PE is positively related to ATT.
Hypothesis 5: ATT is positively related to AU.
Hypothesis 6: SN is positively related to AU.
Hypothesis 7: PBC is positively related to AU.

3.3 Data Analysis

Data analysis is performed to examine and support the research model using Amos v.20.0 which could be split into two parts, i.e., testing reliability and validity. Both items of the questionnaire and the constructs of the research model using a measurement model and assessing the importance of constructs and path coefficient.

3.4 Measurement Model

The assessment of the convergent validity as per proposals of Hair et al. [28] are assessed by looking at the loadings, average variance extracted (AVE), and composite reliability (CR). He suggested that the loadings should be

>0.70, CR should be >0.7, and AVE should be >0.5. The evaluated discriminant validity is compared with AVE's square root with the correlations [29].

4 Results

4.1 Demographic Data

Online gaming players were the target group, and 800 surveys were returned. Table 2 provides the demographic characteristics of the respondents, showing that 14 % of them were female and 86 % were male. Most of the respondents were aged between 16 and 29 years (82%). Most of the income of the respondents was reported as '18,001 – 50,000 baht per month' (41%), followed by 'not more than 18,000 baht per month' (31%). Regarding education, most

Table 2   Profile of respondents

		Frequency	Percent
Sex	Male	687	86%
	Female	113	14%
	Total	800	100%
Age	13 – 15 year	67	8%
	16 – 18 year	173	22%
	18 – 24 year	368	46%
	25 – 29 year	117	15%
	30 – 35 year	47	6%
	36 – 40 year	23	3%
	>40 year	5	1%
Income	<18,000 bath	250	31%
	18,001 – 50,000 bath	324	41%
	50,001 – 85,000 bath	120	15%
	>85,000 bath	106	13%
Education	Primary School	118	15%
	Secondary School	287	36%
	High Vocational	64	8%
	Bachelor	305	38%
Job/Occupation	Student	508	64%
	Office employee	141	18%
	Jobless	70	9%
	Owner business	49	6%
	official	24	3%
	state enterprise	8	1%
	Student	508	64%

Table 3 Summary of descriptive analysis

Variable	Minimum	Maximum	Mean	Std. Deviation
ATT	5.41	6.23	5.77	1.20
FE	4.19	5.41	4.98	1.31
HCI	5.35	5.71	5.58	1.26
PBC	4.89	5.67	5.16	1.36
PE	5.44	6.12	5.84	1.13
SI	4.42	5.39	4.86	1.43
SN	3.49	5.53	4.45	1.57
AU	4.73	5.40	5.03	1.50

of them reported having earned a bachelor's degree (38%), or a secondary school certificate (36%). Regarding employment, 64% reported themselves as students, and 18% reported themselves as office employees.

4.2 Descriptive Analysis

Descriptive analysis of this study shows that the average ATT of Thailand's online gaming players is approximately 5.77, with the highest score of 6.23. The lowest score is 5.41, with a value of standard deviation at 1.20. This also translates that the average ATT is about 5.77%, with the highest ATT at 6.23%. In contrast, the SI has a maximum score of 5.39, and a minimum score of 4.42, with a value of standard deviation at 1.43. The following results show the complete details in Table 3.

4.3 The Measurement Model

All constructs tested a relationship by Pearson's correlation coefficient that measures the statistical. ATT is closely related to two variables: FE (0.48) and HCI (0.71). This analysis demonstrates that SN and FE are unrelated (0.12), PE (0.13), or HCI (0.10). However, SN significantly correlates with SI (0.26) and ATT (0.21). PBC has a significant correlation with PE (0.34) and ATT (0.39), yet AU and SN do not correlate with PBC. Furthermore, if the values were greater than 0.50 [30] at 0.50–0.95, the convergent validity derived from the average variance extracted (AVE) was acceptable. Estimating discriminant validity revealed the model's constructs, which could then be used to determine the particular composite validity using the AVE value. Table 4 shows that the square root of the average variance extracted (AVE) was greater than the correlations. This proves that multicollinearity and discriminant validity do not exist when testing the whole construct.

Table 4   Correlations and square root of average variance extracted (AVE)

Variable	ATT	FE	HCI	PBC	PE	SI	SN	AU
ATT	(0.67)							
FE	0.48	(0.76)						
HCI	0.61	0.37	(0.64)					
PBC	0.39	0.25	0.20	(0.75)				
PE	0.11	0.57	0.35	0.34	(0.76)			
SI	0.32	0.19	0.12	0.25	0.19	(0.82)		
SN	0.21	0.12	0.10	0.14	0.13	0.26	(0.85)	
AU	0.23	0.12	0.13	0.12	0.18	0.08	0.05	NA

Notes: Correlation is significant at the 0.01 level (two-tailed). The square root of average variances (AVE) is showed in the diagonal brackets.
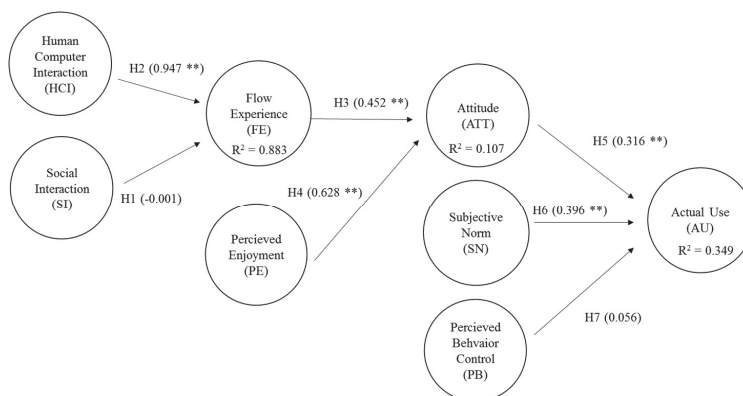

Figure 2   Hypothesis testing.

4.4 Hypothesis Testing

Stated in the literature review, this study proposes seven hypotheses – five of which (H2, H3, H4, H5, and H6) are accepted, and two of which (H1 and H7) are rejected. All hypotheses are persuaded to the extent of the beta coefficients at the level of significance. To increase our understanding, the testing model is shown in Figure 2.

Table 5 shows the relative influence of the variables and the results of the hypothesis testing. ATT is significantly affected by two variables: FE and PE with beta coefficients of 0.425 ($p < 0.001$) and 0.628 ($p < 0.001$) respectively. Additionally, AU is significantly influenced by both variables: ATT and SN in beta coefficients of 0.316 ($p < 0.001$) and 0.396 ($p < 0.001$) successively. In contrast, SI does not affect FE with an estimated coefficient

Table 5   Summary of the structural model

Hypothesis	Variable	Estimate	p-value	Remark
H_1	FE ← SI	−0.001	0.983	Rejected
H_2	FE ← HCI	0.947	***	Accepted
H_3	ATT ← FE	0.452	***	Accepted
H_4	ATT ← PE	0.628	***	Accepted
H_5	AU ← ATT	0.316	***	Accepted
H_6	AU ← SN	0.396	***	Accepted
H_7	AU ← PBC	0.056	0.553	Rejected

Note: *** significant at the 0.001 level.

Table 6   Goodness of fit

Index	Cut-off	Result	Remark
CMIN	–	354.59	Fit
CMIN/d.f.	<3.0	2.333	Fit
GFI	>0.9	0.956	Fit
AGFI	>0.9	0.940	Fit
NFI	>0.9	0.932	Fit
CFI	>0.9	0.958	Fit
RMSEA	<0.05	0.041	Fit

of 0.001 (p = 0.983). PBC does not affect AU with an estimated coefficient of 0.056 (p = 0.553) as well.

4.5 Goodness of Fit Test

This study examines the goodness of fit through the application of seven indices, i.e.: CMIN, CMIN/d.f., GFI, AGFI, NFI, CFI, and RMESEA [31]. The results of the analysis convey that all the lists show satisfying coefficients. As it stands, the model created for this inquiry meets the fit criteria. Table 6 illustrates further data on all indices of goodness of fit.

5 Discussion and Findings

From the study of behavioral theory and according to the plan of explaining the views of live streaming in online platforms, it is found that the occurrence of user behavior should create a positive attitude towards watching live streaming. As mentioned above, the variables of FE ($\beta = 0.452$, p < 0.01) and PE ($\beta = 0.628$, p < 0.01), both variables are indirectly affected in live stream viewing. Chen [32] said that live streaming takes center stage in

worry and wariness issues, which affects non-gamers' passion for playing. The intensity and linearity of the game's understanding are also shown by game change. Chang et al. [33] identified that in online games, flow experience will emphatically strengthen the association between utilitarian and decadent duration estimations. FE is also described as 0.88% by both variables in HCI and SI. HCI and SI are considered to have a positive effect on FE (H1, H2). This study found that H3 and H4 were significant suggesting that ATT influenced both FE and PE. Similar evidence was obtained from our result that H2 was strongly statistically significant by HCI to FE. These results conclude that social games broaden the system presentation of any individual, implement perkiness, and encourage acknowledgement in any gaming society [34]. Additionally, according to Li [35], social participation and correspondence with other players or PCs causes gamers to have a physical and mental connection to the games in a social network. A significant relationship was shown between ATT and AU (H7). Also, SN and PBC were positively related to AU following H6 and H7. Likewise, SN, ATT, and PBC variables were all able to describe 35% of live streaming in this study. In previous studies on subjective norms (SN), Lee recommends that gamers' recurrence of game-playing will correspond with their friends over time [35]. While Manty [36] provided an explanation in an online virtual environment, PBC also mentions self-efficacy and perceived system ease of use. On the other hand, FE and PE can refer to ATT in 0.10 only. SI does not relate to FE, so this hypothesis has been rejected in H1. The H7 showed a no significant relationship between PBC and AU in the experiment as well.

6 Limitation and Findings

Research Limitations: Limitations found during the research include a lack of thought about the importance of gamer participation in individual online gaming communities. This study only measured factors related to the online gaming community in Thailand. There are not many companies in Thailand that produce online games. Therefore, online game experts will not need to evaluate models to discuss an outcome in online game business. The sample group is limited. And no similar research has been done in Thai gaming companies before. Future research should continue on this. By separating the context of the study according to the type of equipment the players use. Due to the variety of devices such as mobile phones or laptops affecting the feeling of use in terms of convenience and accessibility to watch live broadcasts related to gaming, behavioral science models marketing strategies

should be applied and activities should be designed to encourage gamers to watch live streams. The behavior of the players should be studied qualitatively as the definitions of FE and PE variables involve different personal attitudes and norms. These factors can explain the behavior of individual players. Therefore, marketers can design strategies that are suitable for their target customers.

7 Conclusions

By assessing actual usage, this research adds to the current literature on online gaming and the notion of planned behavior. The goal was to create an enhanced TPB model that could predict and explain a Thai online gamer's behavioral intention to play online games. In conclusion, three discoveries are revealed as a result of the investigation: Firstly, the findings can be concluded as such that the planned behavior (TPB) theory can explain the players' attitude; however, the variable Perceived Behavioral Control (PBC) may not be able to explain the behavior of online game players. Secondly, most gamers do not feel they have difficulty controlling the use of various online platforms; therefore, a strategic plan for creating a positive attitude (ATT) towards live streaming for online games should be carried out with a focus on psychological factors - such as creating Flow experience (FE) and allowing people to enjoy online game playing via watching live streaming. Lastly, the social interaction variable (SI) which influences those around them, or the opinions of leaders, namely the caster, should be used in order to promote the behavior of online gamers with live streaming in the future. It demonstrates that social influence and enjoyment are major determinants of real online game play. To improve real usage, game development businesses should conduct suitable assessments on pleasure factors and put games on social networks and live streaming channels.

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