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APPLYING COMBINED TECHNOLOGY ACCEPTANCE MODEL AND THE THEORY OF PLANNED BEHAVIOR TO STUDY EFFECT OF INTENTIONTO PLAY CASUAL ONLINE GAME

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ABSTRACT

In year 2012, National Statistical Office reported that Thai people age between 15-24 years old has highest usage rate of internet while 65.4% of them spend time online for playing games. For marketers, it is important to understand how to design a successful game online that can satisfy the target users and retain those users. Therefore this study aims to study factors that motivate gamers to play casual game online. The results this study can make game online marketers to deeper understand their customers and can create suitable motivated marketing strategies for their markets.The results of this study confirm the perceived usefulness, flow experience, perceived enjoyment, human-computer interaction, subjective norm and attitude toward playing online games have significant relationship with behavioral intention at 0.05 level.

Keywords: Online game, behavior, combined technology acceptance model and theory of planned behavior

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Introduction

In the present time, the life style of people in the society change rapidly. Most people find the equipment or the instrument to be comfortable for them. Therefore, the technology is very important for daily life of people in the society. At the same time, most people are also like the entertainment and funny to relax together. The easiest way to relax is playing the game because the game helps the player feel good, enjoy and funny. Sometimes, they flow to play the game, they forget everything around them. It can help the players when they serious.

It's known that, most of children and adults like to use more technology, especially, the urban people. There is more high technology than the past.

In the past, we just only know the desk top or personal computer. It must set on the place. It can't move anywhere and the games are not several like a present time. However, the style of technology has a lot of developments in the present time. It can support the user more than the past, such as, mobile phone. The mobile phone in the past is just only use for communicating. But now it changes and develops to become a smart phone (http://www.pcmag.com/encyclopedia/). The smart phone can do a lot of thing in the same time and it can connect the internet 3G or 4G. As a result, most of people like to use the smart phone more than the mobile phone in the present time. Because of the people can play the game, chat, line, and etc., when they have more leisure times. Kim & Lee (2015) said that online game on smart phone is the game contents are transplanted from various platforms into a smart-phone platform and virtual images are projected as a game interface at the smartphone's output screen. It can make the life not boring.

Prior research Teetut (2012) to study the topic of applying combined technology acceptance model and the theory of planned behavior to study effect of intention to play online game in Thailand. The results of this study confirm the Perceived usefulness, Human-computer interaction, Social interaction and attitude toward playing online games in predicting behavioral intention. In this article the researcher would like to know about effect of intention to play casual online game and aim to type of game by select casual game only for study.

Litterature review and research hypotheses

Combine TAM-TPB model (C-TAM-TPB)

Theory of Reasoned Actions (TRA) proposes that intention is solely and directly influences the adoption behavior and intention which are determined by two factors: subjective norms which are defined as the person's beliefs that specific individuals or groups think he should or should not perform and motivation to comply with specific referents and attitude towards behavior, which is defined as the person's beliefs which behaviors lead to certain outcomes and the evaluation of these outcomes (Fishbein & Ajzen, 1977). However, Ajzen (1991) introduced Theory of Planned Behavior (TPB) as an extension of TRA which includes a third determinant of intention, perceived behavioral control that refers to people's perceptions of their ability to perform a given behavior. Davis (1989) proposed Technology Acceptance Model (TAM), building on the TRA, to explain and predict the adoption and use of information technology. He theorized that an individual's intention to use an innovation is determined by two beliefs: perceived usefulness, defined as the extent to which a person believes that using the system will enhance his or her job performance, and perceived ease of use, defined as the extent to which a person believes that using the system will be free of effort. Taylor and Todd (1996) combined the predictors of TPB with perceived usefulness from TAM to provide a hybrid model which is called Combined TAM and TPB. So this new model consisted of six factors; Behavior intention, attitude toward behavior, perceived behavioral control, subjective norms, perceive usefulness and perceived ease of use.

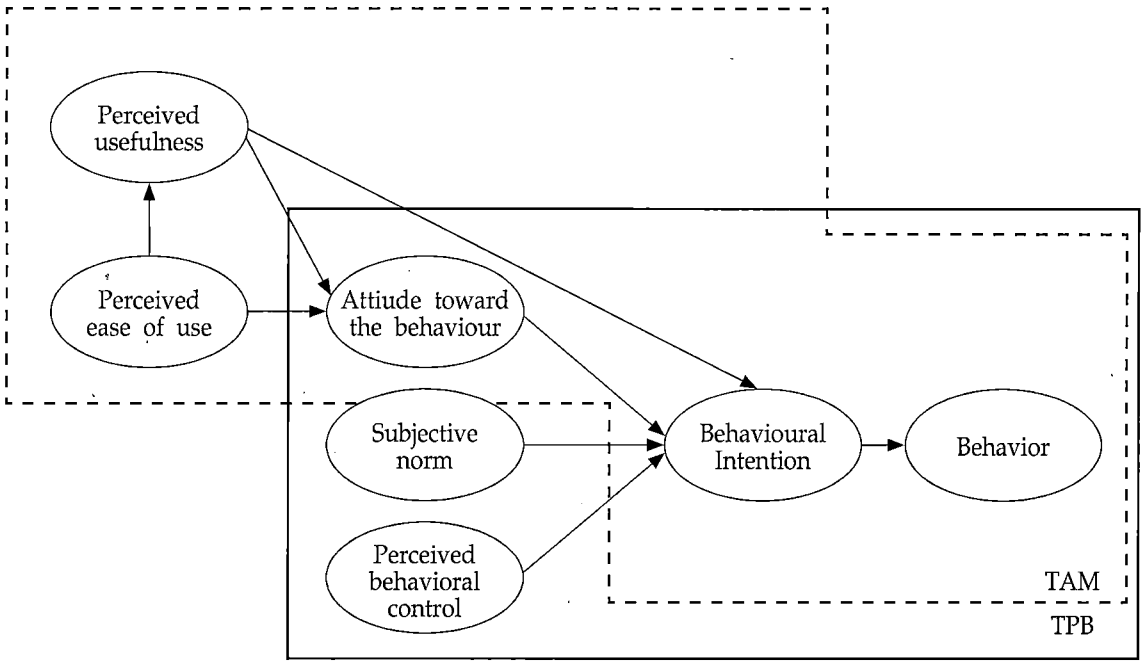

Figure 1. Combined TAM-TPB

The factors influencing intention behavior expected

Csikszentmihalyi and LeFevre (1989) introduced the original concept of flow. He defined it as the holistic experience that people feel when they act with total involvement. This definition suggests that flow consists of four components-control, attention, curiosity, and intrinsic interest. When in the flow state, people become absorbed in their activity: their awareness is narrowed to the activity itself; they lose self-consciousness, and they feel in control of their environment. Such a concept has been extensively applied in studies of a broad range of contexts, such as sports, shopping, rock climbing, dancing, gaming and others.

In online gaming settings, players tend to be motivated mostly by intrinsic interests (Huang & Cappel, 2005), so this paper focuses on intrinsic motivation. According to previous research, when individuals' behaviors are prompted by intrinsic motivation such as interest and enjoyment, they are more willing to persist in such behaviors in the future (Deci, Koestner, & Ryan, 1999). As the conceptualization of intrinsic motivation, enjoyment has received considerable research attention in recent years (Koufaris, 2003; Li, Chau, & Lou, 2005; Venkatesh, 2000). Enjoyment can be defined as the degree to which performing an activity is perceived as providing pleasure and joy in its own right, aside from performance consequences (Davis, Bagozzi & Warshaw, 2012).

Interaction is the key related to the computer games or smart phone. Interaction means that behavior of two objects to communicate with and affect each other (Laurel, 1993) as players can interact with the talk opponents' monsters or trading outfit to promote or prevent attacks. The impact on the popularity of the game and interaction with the content in the game the player experience (Choi & Kim, 2004). There are two types of interaction is the first interaction between the user and system the second type is the interaction between users with other players. Between users and computer system or smart phone called the human computer interaction and Social interaction is the process by which we act and react to those around us. In a nutshell, social interaction includes those acts people perform toward each other and the responses they give in return. Having a quick conversation with a friend seems relatively trivial.

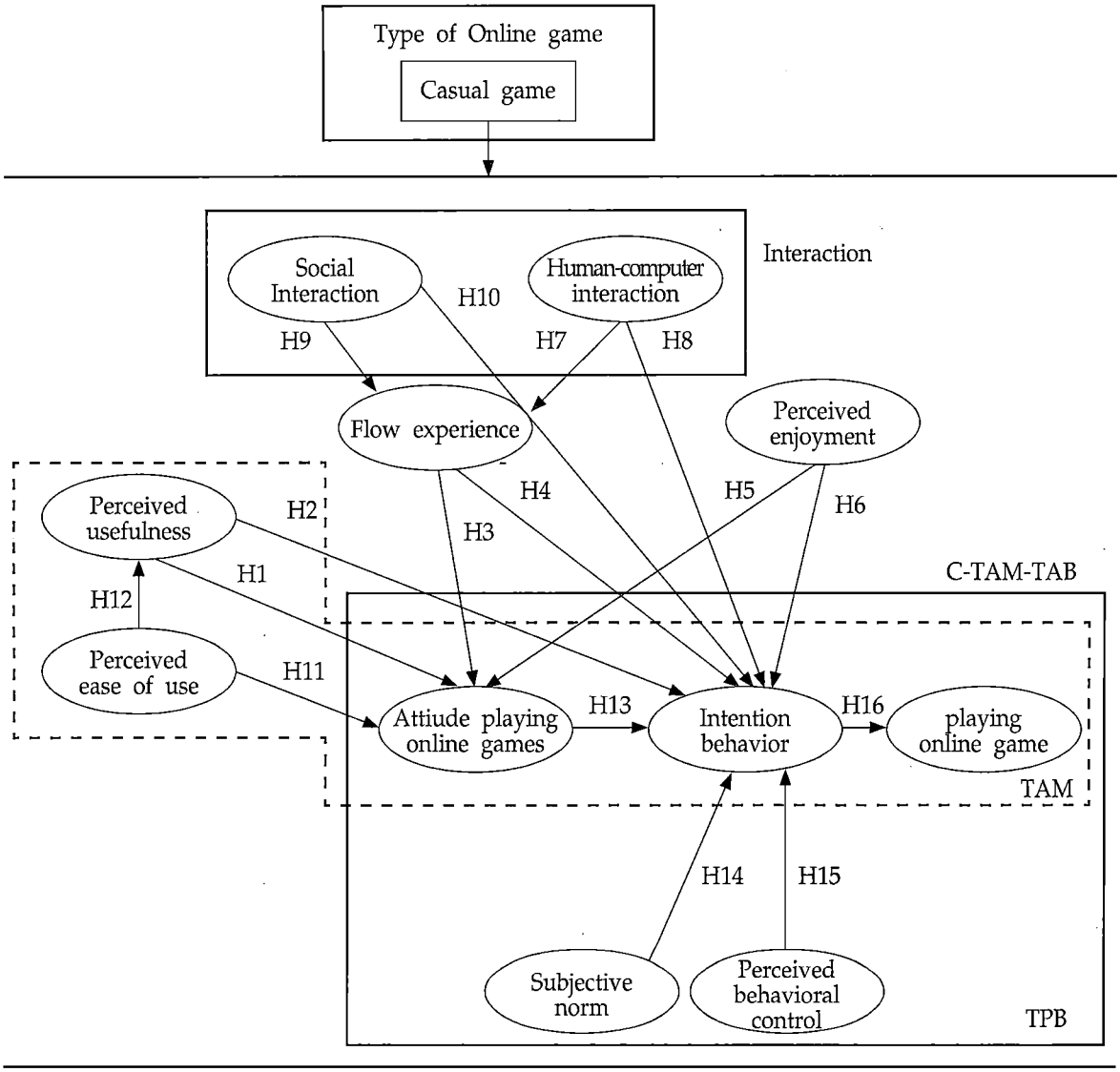

Figure 2. conceptual framework

Methodology

Sampling procedures

Sampling method choose purposive sampling by discretion of the researcher to choose only the heavy users of online game player in Chonburi province. The questionnaires were distributed to participants at internet game shops in Chonburi and also collecting data from students in universities (Sripatum university Chonburi campus, Burapha University), primary school and high schools (Chonradsador-numrung school, Preecha nusas school, Chonburi sukkhabot).The participants were asked about how much time they spent with the computer on an average day and free spaces for the hours and minutes were provided. Participants played with PC/ Macs more than 63.58 minutes or with video game consoles more than 9.65 minutes or with mobile phones more than 6.95 minutes were selected as heavy users. This research collects data 380 sets and chooses completely 360 sets of the questionnaire, as 94.7 % of the questionnaire. The researcher used a structural equation modeling (SEM) tool, WarpPLS program (Kock, 2013).

Measures

Instrument for collect data take developed from document and relate research about the online game.

Questionnaire for collect data is Thai. The questionnaire was divided into two main sections. The first section consisted of items measuring behavior, variables are attitude toward the behavior, subjective norm, perceived behavioral control, flow experience, perceived enjoyment, perceived usefulness, perceived ease of use, social interaction, Human computer interaction, behavioral intention, usage behavior and self concept. Respondents were asked to rate their perceptions on a 5-point Likert scale. The second section of the questionnaire was designed to collect information on general Information consisted of Gender, Age, Status, Level of study, Occupation, Income, Experience for using internet, Place for playing the online game, Type of the online game, and time spend with computer games..

Results

Sample's Characteristic

Measure	Item	Frequency	Percentage
Gender	Male	66	34.4
	Female	126	65.6
Age(year)	Less than 10 year	0	0.0
	10-12 year	2	1.0
	13-15 year	33	17.2
	16-18 year	57	29.7
	19-21 year	100	52.1
	More than 21 year	0	0.0
status	Single	192	100.0
	Married	0	0.0
Education	Below bachelor degree	112	58.3
	Bachelor's degree	80	41.7
Income	Not income	192	100.0
	Below or equal 10,000 Baht	0	0.0
Experience for using internet	Lower 1 year	9	4.6
	1-5 year	70	36.5
	Than 5 years	113	58.9
Place for playing the online game	Home	148	77.1
	School/ Office	0	0.0
	Game shop	44	22.9
	Other/ Please specify	0	0.0

Among the 192 respondents, 126 respondents (65.8%) were female and 66 respondents (34.4%) were male. The majority of the respondents were 19-21year (52.1%), Almost single status (100%). Education levels were below bechelor degree, with 58.3% and having bachelor's degree (41.7%). Respondents not have income (100%), Year of internet experience of respondent, about 58.9% of the respondents have experience for using internet more than 5 years, Place of playing online game, about 77.1% of the respondents playing the online game at home.

Statistics and Data Analysis

The reliability, convergent validity, discriminant validity, collinearity, and predictive validity of the latent variables are shown in Table 1. The composite reliability for all the latent variables are above the 0.707 threshold for reliable constructs (Fornell & Larcker, 1981). Composite reliability is

recommended for structural equation modeling over Cohen's alpha which assumes equal reliability for all indicators (Bagozzi & Yi, 1988). The average variance extracted (AVE) are close to or above 0.5 for convergent validity (Fornell & Larcker, 1981). The full collinearity variance inflation factor (VIF) is calculated for all the latent variables in the model and are below the 3.3 threshold for multicollinearity (Cenfetelli & Bassellier, 2014; Petter, Straub, & Rai, 2007). The Stone-Geisser Q^2 coefficients for all the latent variables are positive, confirming the predictive validity for each latent variable block in the model (Tenenhaus et al., 2005). As shown in Table 2, the square root of the AVE for each construct is greater than the correlations with all other constructs, confirming the discriminant validity of all the constructs used in the model.

Table 1 Latent Variable Reliability and Validity

Latents	R^2	CR	Cronbach's alpha	AVE	VIFs	Q^2
ATU	0.555	0.942	0.907	0.844	2.898	0.555
SJN		0.915	0.861	0.783	2.244	
PBC		0.868	0.696	0.767	1.704	
FE	0.500	0.901	0.862	0.645	3.260	0.496
PE		0.948	0.917	0.858	3.099	
PU	0.334	0.933	0.903	0.777	2.536	0.332
PEU		0.923	0.874	0.799	2.848	
SI		0.956	0.938	0.845	2.788	
HCI		0.907	0.846	0.765	2.353	
INT	0.553	0.896	0.826	0.743	1.492	0.378
BEH	0.185	0.925	0.839	0.861	1.787	0.188

Table 2 Discriminant Validity

	ATU	SJN	PBC	FE	PE	PU	PEU	SI	HCI	INT	BEH
ATU	(0.919)	0.589	0.570	0.605	0.704	0.501	0.610	0.614	0.530	0.364	0.484
SJN	0.589	(0.885)	0.366	0.529	0.509	0.670	0.475	0.500	0.403	0.225	0.419
PBC	0.570	0.366	(0.876)	0.494	0.574	0.434	0.480	0.473	0.424	0.221	0.416
FE	0.605	0.529	0.494	(0.803)	0.734	0.559	0.722	0.571	0.662	0.382	0.528
PE	0.704	0.509	0.574	0.734	(0.926)	0.544	0.659	0.555	0.587	0.304	0.478
PU	0.501	0.670	0.434	0.559	0.544	(0.881)	0.573	0.632	0.518	0.258	0.462
PEU	0.610	0.475	0.480	0.722	0.659	0.573	(0.894)	0.631	0.589	0.462	0.522
SI	0.614	0.500	0.473	0.571	0.555	0.632	0.631	(0.919)	0.636	0.288	0.570
HCI	0.530	0.403	0.424	0.662	0.587	0.518	0.589	0.636	(0.875)	0.408	0.520
INT	0.364	0.225	0.221	0.382	0.304	0.258	0.462	0.288	0.408	(0.862)	0.408
BEH	0.484	0.419	0.416	0.528	0.478	0.462	0.522	0.570	0.520	0.408	(0.928)

Note: Square roots of average variance s extracted (AVE's) shown on diagonal.

Testing of Hypotheses

Hypotheses: All variable have relationship for casual game.

Table 3 Summary of Hypothesis Test Results

Hypothesis	β	P-Value
Perceived usefulness → attitude	0.080	0.089
Perceived usefulness → intention	0.240*	<0.001
Flow experience → attitude	0.068	0.127
Flow experience → intention	0.210*	<0.001
Perceived enjoyment → attitude	0.470*	<0.001
Perceived enjoyment → intention	0.254*	<0.001
Human-computer interaction → flow experience	0.479*	<0.001
Human-computer interaction → intention	0.248*	<0.001
Social interaction → flow experience	0.303*	<0.001
Social interaction → intention	-0.063	0.144
Perceived ease of use → attitudes	0.219*	<0.001
Perceived ease of use → Perceived usefulness	0.578*	<0.001
Attitude → intention	0.229*	<0.001
Subjective norm → intention	0.099*	0.049
Perceived behavioral control → intention	0.014	0.407
Behavioral intention → actual behavior.	0.430*	<0.001

* at significant level 0.05

From Table 3 the hypotheses are tested by examining path coefficients (similar to standardized beta weights in a regression analysis) and their significance levels in the PLS regression structural model. To examine the statistical significance of path coefficients, I performed stable resample to obtain estimates of t-statistic values (Kock, 2013).

Attitude toward playing online games, Perceive enjoyment, subjective norms, Perceived behavioral control, Flow experience, Human-computer interaction, Social interaction and Perceived usefulness together explain 55.3% of the variance in intention to play the online game.

Perceived usefulness, Perceived ease of use, Flow experience, and perceived enjoyment together explain 55.5% of the variance in the attitude toward playing online games.

Human-computer interaction and Social interaction together explain 50.0% of the variance in the flow experience.

Perceived ease of use explains 33.4% of the variance in the perceived usefulness.

ntentions to play the online game explain 18.5% of the variance in the behavior intention to play the online game.

Thirteen of the sixteen hypotheses are supported (see Table 3 for a summary of the results). Consistent with the predictions, perceived usefulness has a significant effect on intention to play as well as on attitude toward playing online games, human-computer

interaction, flow experience, perceived enjoyment, and subjective norm at significant level 0.05.

Perceived enjoyment, and perceived ease of use have a significant effect on attitude toward playing online game at significant level 0.05.

Human-computer interaction and Social interaction has a significant effect on flow experience at significant level 0.05.

Perceived ease of use has a significant effect on Perceived usefulness at significant level 0.05.

Intention to play online game has a significant effect on actual behavior to play online game at significant level 0.05.

Inconsistent with the predictions social interaction and perceived behavioral control do not effect on intention to play the online game at significant level 0.05.

Discussion

Found that the predictions, perceived usefulness has a significant effect on intention to play support by the study of Suki (2011) found that perceived usefulness as a key factor influences subscribers' intention to use 3G mobile services as well as on flow experience, perceived enjoyment, human-computer interaction, attitude toward playing online games support by the study of Lee (2009), found that flow experience, perceived enjoyment, human-computer interaction, attitude toward playing online games have a significant effect on intention to play online game and self concept .

Perceived enjoyment and Perceived ease of use have a significant effect on attitude toward playing online game the results support by the study of Choi and Kim (2004), found that people continue to play online games if they have optimal experiences while playing the games. Hsu and Lu (2004) found that the easy-to-use interface of an on-line game also played a critical role in determining perceptions of usefulness and in forming flow experience.

Human-computer interaction and Social interaction has a significant effect on flow experience results support by the study of Lee (2009), found that flow experience is a more important factor in influencing customer acceptance of online games.

Perceived ease of use has a significant effect on Perceived usefulness and intention to play online game has a significant effect on actual behavior to play online game. The results support by the study of Davis (1989), found perceived usefulness was significantly correlated with both self reported current usage and self-predicted future usage. Perceived ease of use was also significantly correlated with current usage and future usage.

Intention to play online game has a significant effect on actual behavior to play online game, the results support by the study of Ajzen (1991), found that behavioral intention to use such as social attitude and personality trait have played an important role in these attempts to predict and explain actual system use.

Whereas, the social interaction and perceived behavioral control also do not effect on intention to play because players who observe or hear about others who are important to them playing online games with negative results are encouraged to participate in the games themselves. Therefore negative word-of-mouth is important in promoting any online game. Thus, contrary to the findings by Lee (2009).

Limitation

To evaluate this research model, this study has conducted survey using the heavy users of online game player in Thailand. The questionnaires were distributed specifically to students who were game online heavy users in Universities (Sripatum university chonburi campus, Burapha university) and High Schools (Chonradsadornumrung school, Preecha nusas school, Chonburi sukkhabot) in Chonburi province only. It did not cover overall cities in Thailand.

Recommendations

From the result, perceived usefulness has a significant effect on intention to play as well as on flow experience, perceived enjoyment, human-computer interaction, attitude toward playing online games and self concept. Therefore researcher suggests the game producers as:

1. The producers should emphasis on increasing perceived usefulness of users by enable users to

accomplish their tasks more quickly, make online game easier for there to carry out my tasks and make me earn money from the virtual goods sale.

2. The producers should emphasis on increasing human-computer interaction of users by provide good multimedia user interfaces, such as audio, graphics and animation, provide good navigation structures and aids, such as media controls, basic controls, media selection and online help and provide easy-to-control input device interfaces, such as mouse and keyboard.

3. The producers should emphasis on increasing social interaction of users by make new friends when playing online games, create communication interaction and cooperate between user and friends while playing online games.

4. The producers should emphasis on increasing attitude toward playing online games of users by create feel good when user playing online games and leisure activity.

Recommendations for further study

1. A greater specificity is required for each of the conceptual demographic groups. The participants of this study only with an age range of 10-20 years old which is not focused enough to fully appreciate the diverse and contrasting personal, social, and developmental needs, aims and motivations of these populations. Therefore, the further research should more focus on variety of age more than 20 years old.

2. Recommend for longitudinal studies which take greater account of the environmental factors both the physical and temporal frameworks. Moreover, familial, cultural, and socioeconomic contexts including opportunity, and cost remain unexplored.

3. Recommend for quantitative studies might examine the requirement and careers of adolescents who play games. The results could provide guidance concerning particular themes or factors which benefit for game companies to create advertising or promotion campaign for specific groups of customers.

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