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

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ABSTRACT

The purpose of this study was to apply combined the technology acceptance model and the theory of planned behavior (C-TAM-TPB) and to study the effect of intention to play online game in Thailand. The results of this study confirm that the perceived usefulness, human-computer interaction, social interaction and attitude toward playing online games could predict behavioral intention. The insignificance of the link flow experience, perceived enjoyment, subjective norms, and perceived behavioral control to intention indicates the need for further research in the context of online gaming. Notably, this study found that perceived usefulness was a more important factor than attitude toward playing online games in predicting behavioral intention. Perceived enjoyment was a more important factor than perceived ease of use in predicting attitude toward playing online games.

Keywords: Online game, technology acceptance model, planned behavior

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Introduction

In the age where society changes rapidly with technology of various modern facilities, there are many amusements losing from the urban society. They remain only small portion still admire to play in upcountry because of many factors, especially, the modern innovative technology, the growth of the city and no area for children to romp. The people don't gather as they did in the past. The Thai amusements seem to be outdated. At the present time children and adolescents are still in the same group of friends but they play more network games or the Internet through the online computer with a large number of interactions. (Gorriz & Medina, 2000) Talking with their friends is really like playing but it can't be tangible.

The computer game is also one type of the children digital age, which can be divided into two types of players. The first type is that one player competes against the computer and the second type is to play games on the network system. (Chris, 1984) For playing game on the network system that can be distinguished into two other types. These are Multiplayer and Massive Multiplayer. Multiplayer online game is a game to play on the Internet. Most will play in a limited number of players such as the chess game played in pair. The others can connect to the players but they are just only the viewers. The viewers can talk to other people like sitting in a circle and watching the two players play to each other. Massive Multiplayer Online Game is a game that can let a lot of players play at the same time. (Chan & Vorderer, 2006) Playing network game can separate network system into two types. The first is an online game via local area network or LAN that can play with four players, eight players or more than ten players together. Qualification of that game can support how many players to play game. The second is the online game via the Internet. This type can support a lot of players because the producer of game has a big server for supporting many players. The online game can build a dream or an imagination of the players to appear as true on the screen of the computer of the users. The game players will be able to talk to create real interactions through the drama being played like a social other one that can have a meal or talk together too. Multiplayer can make the game players have freedom from ideas and play games together. They can fight forever. There is no limit.

Today, there are many types of the online games, such as RAN ONLINE, Pangya, Audition, SF, etc. The online games are popular because of the Massive Multiplayer Online Game.(Chan & Vorderer, 2006) The players can create a society in the game. Besides, they can talk together. This online community will have a larger social fact. They may have hundreds or thousands of friends. But in real society, they may have not hundreds of friends. If a group of friends are related well, it will feel fun and emotional with the game, especially with more players. He can buy thing in game and put on showing the other players in the game to see and envy him. In the real life, he may not be good to show to others to see him. The online game has a lot of cute characters. Both male and female player can play the games. Thus, the on line game is very popular to the students and the collegians. It may come from their environment because they talk about this game for many times. As a result, they really want to know how to play the online game. They try to play game every day. After they play, it becomes habit to play when they have more free times. Today, there are fewer children's playgrounds and parents do not want the children to play outdoors. Therefore, parents usually find toys for their children to play at home or to leave them at the internet caf. The manufacturers of game companies have researched the nature of children. They know what children need and are interested. Their game producers produce many games to respond to the nature of children.

According to the above information, the purpose of this study to combine the technology acceptance model and the theory of planned behavior to study the effect of intention to play online games in Thailand.

Literature Review

This research has included various documents and summarized the concepts and theories to use as a framework for studying. Topics include the following.

Concepts and principles of psychology

1 Factors influencing intention behavior expected.

2 Theories of planned behavior and the Technology Acceptance Model.

Factors influencing intention behavior expected

1. Attitude toward the behavior

Factors occur within the individuals. Overall assessment of the behavior of the individuals is believed to be the result that follows. If believe that the positive results, the person will have positive attitude toward the behavior. In contrast, if the assessment is negative, the person will have a bad attitude toward such behavior. (Ajzen, 1991)

2. Subjective norm

The perception of the individual about the expectations or needs of individual groups in society are important to people. To show or not to show any behavior, individual is motivated to comply with the requirements of the individuals in society. Especially, groups closely people such as family members. (Ajzen, 1991)

3. Perceived behavioral control

If people perceive that they are able to act in such circumstances, and can control the outcomes desired, they are more likely to display their behavior.(Ajzen, 2002) Ajzen also believes that the individual is trying to control the various factors both internal factors such as the individual's knowledge, skills, etc., and external factors, such as. Factor in the perceived behavioral control. Their own behavior is determined by any of this. Beliefs of individuals with factors (eg, continuous) may promote or inhibit the behavior. And the recognition of such factors are affecting confidence. The individual can act or not.

4. Interactions

Interaction is the key of the computer games. Interaction means that behaviors of two objects communicate with and affect each other (Laurel, 1993). Players can interact with the talking opponents, or monsters and trade outfit to promote or prevent attacks. The impact on the popularity of the game and interaction with the content in the game the player has experience (Choi & Kim, 2004). There are two types of interaction. The first interaction is between users and computes. The second type is the interaction between users and other players. The interaction between users and the computer system is called the human interaction. Players social interaction refers to interaction between two or more (Voiskounsky, Mitina, & Avetisova, 2004). Pilke found that the flow occurs in the interaction with the data (Pilke, 2004). Kim, Oh, and Lee found that social interaction and human computer interactions were affecting the flow experience (Kim, Oh, & Lee, 2005). Therefore, we expected that human computer interactions and social interaction flow allows players to enjoy and enhances their intention to play the online games.

Theories of planned behavior and the Technology Acceptance Model

There are several theories about the expected behaviors. The theories of behavior planning include The Theory of Reasoned Action (TRA), The Technology Acceptance Model (TAM), and The Theory of Planned Behavior (TPB) and The combined TAM-TPB. All the theories explain the style of action or the expression of people. The researcher has studied the concepts and has several reasons from the theories to support the information of this research below.

1. The Theory of Reasoned Action or TRA

Theory of Reasoned Action or TRA (Fishbein & Ajzen) is a widely accepted theory in social psychology. It explains that behavior of individuals (Behavior) come from the intent of the behavior (Behavioral intention) caused by factors between (1) Attitude toward a behavior caused by the belief that in Former (salient belief) and the consequences of that belief, and (2) Subjective norm from the belief that a model (Normative belief) that supports motivation. There are the articles that support the relationship of the TRA theory.(Jimming & Liu, 2007)

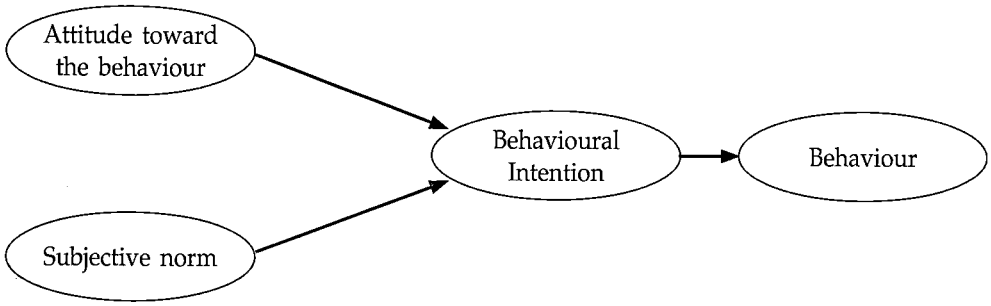

Figure 1: Theory of Reasoned Action

2. The Technology Acceptance Model or TAM

Technology Acceptance Model, or TAM and the basic theory TRA are a theory that is popular today to describe the behavior of individual recognition. In technology or technologies used, there are the articles that support the relationship of the TAM theory. (Davis & Usefulness, 1989; Fetscherin & Lattemann, 2008; Hua & Haughton, 2009; Lee, 2009; Taylor & Todd, 1996)

TAM shows that behavioral intention or intended use of technology are based on attitudes, beliefs arising from (1) Perceived usefulness and (2) Perceived ease of use by past research that has led to the application of theory, TAM, and concluded that the perception that affects such behaviors. Goals must be placed in use about Information systems and technology to create a great experience for users (Adams, Nelson, & Todd, 1992; Sun & Zhang, 2006).

Davis used TAM in the application of theory to the new information system and focused on the behavior and beliefs (Davis & Usefulness, 1989). The two parts are perceived benefits and perceived ease of use. It also said that the social value has no influence on behavior when deploying new technology. However, new research says social norm have influenced in the first actual usage (Keil, Beranek, & Konsynski, 1995).

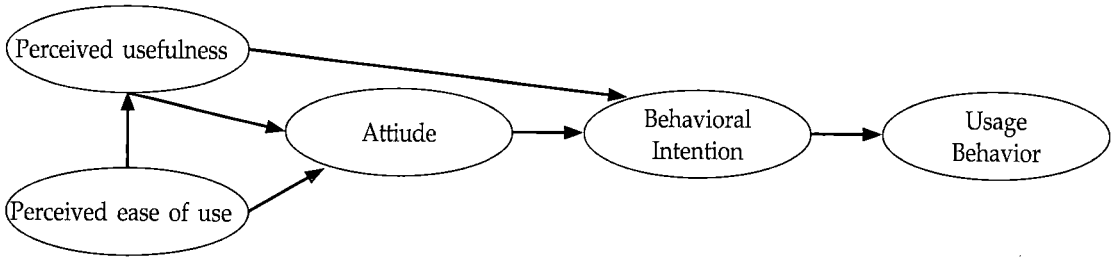

Figure 2: Technology Acceptance Model

3. The Theory of Planned Behavior or TPB

The Theory of Planned Behavior or TPB presented by Ajzen, has been developed since 1985 and in 2006 social psychology developed the theory of Reasoned Action (TRA) by adding the fundamental use of efficacy. Perceived behavioral control controls the sense that is conceptual intangible. One is tangible to obtain a desirable goal (Ajzen; AJZEN) with the following basic structure theories.

1. Behavioral Beliefs: an individual's belief about consequences of particular behavior. The concept is based on the subjective probability that the behavior will produce a given outcome.
2. Normative Beliefs: an individual's perception of social normative pressures, or relevant others' beliefs that he or she should or should not perform such behavior.
3. Control Beliefs an individual's beliefs about the presence of factors that may facilitate or impede performance of the behavior.

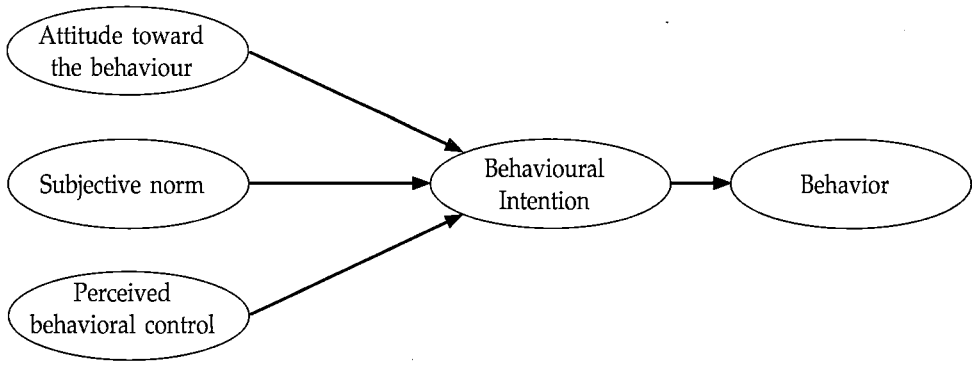

Figure 3: The Theory of Planned Behavior

4. Hybrid Models for Technology Acceptance

Theory of Reasoned Actions (TRA) proposes that intention is solely and directly influences the adoption of behavior and intention which are determined by two factors: the first factor is 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 the second factor is attitude towards behavior, which is defined as the person's beliefs which behaviors lead to certain outcomes and the evaluation of these outcomes (Fishbein and Ajzen).

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 (Davis and Usefulness 1989) proposed Technology Acceptance Model, 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 and perceived ease of use, perceived usefulness is 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 is 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 four factors; attitude, perceived behavioral control, subjective norms and perceived ease of use.

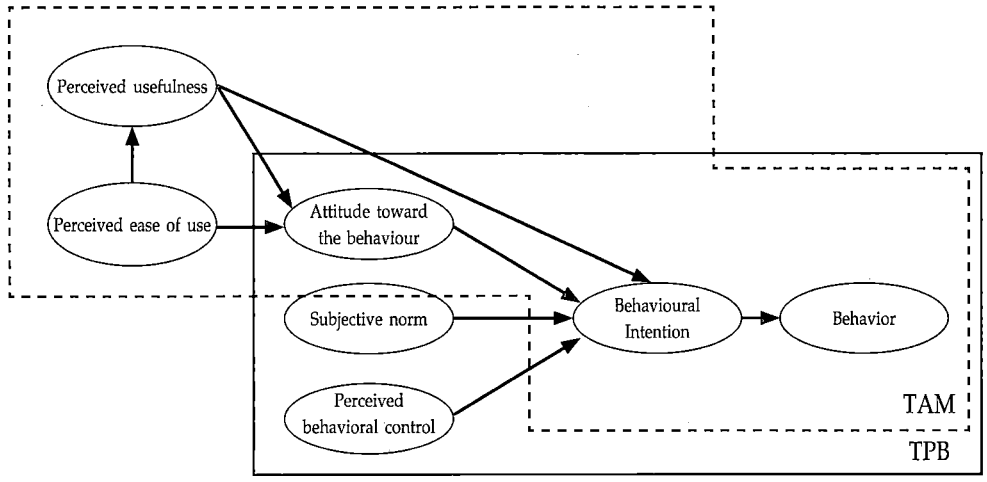

Figure 4: Combined TAM-TPB

So if you want a user to like playing the online games, we should study variables or factors affecting the intention to program which include attitude toward the behavior, subjective norm and perceived behavioral control.

Through the extensive review of past research, we hypothesized that there are effects of intention to play online game in Thailand.

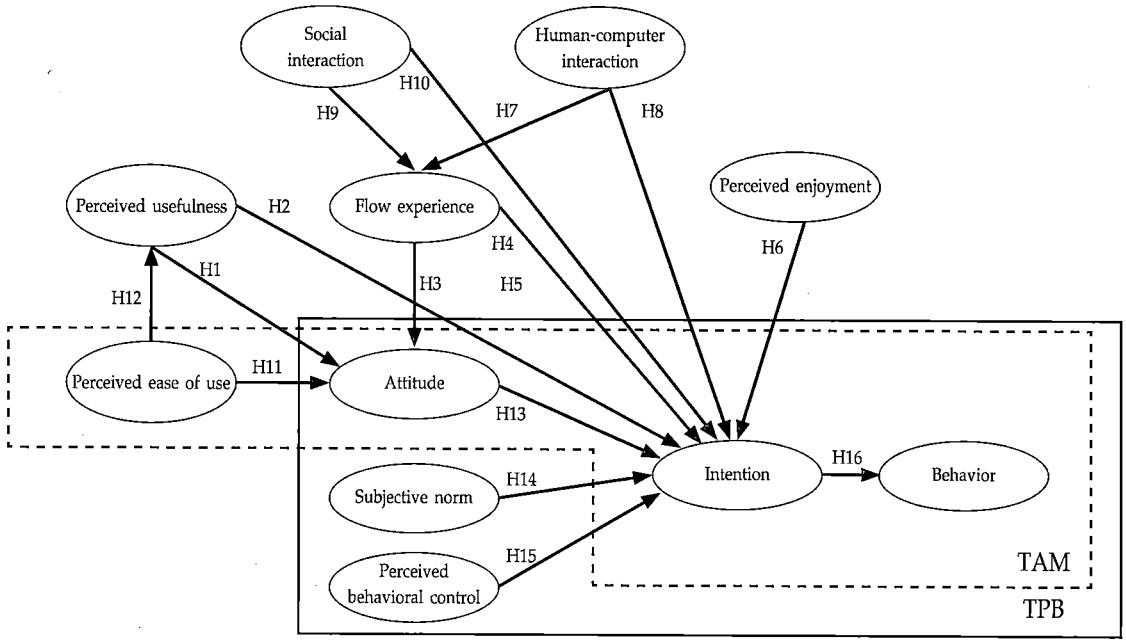

Figure 5: The research model

Hypotheses

H1: There are positive relationship between Perceived usefulness and attitude toward playing online games.

H2: There are positive relationship between Perceived usefulness and intention to play online games.

H3: There are positive relationship between Flow experience and attitude toward playing online games.

H4: There are positive relationship between Flow experience and intention to play online games.

H5: There are positive relationship between Perceived enjoyment and attitude to playing online games.

H6: There are positive relationship between Perceived enjoyment and intention to play online games.

H7: There are positive relationship between Human-computer interaction and flow experience of online game players.

H8: There are positive relationship between Human-computer interaction and intention to play online games.

H9: There are positive relationship between Social interaction and flow experience of online game players.

H10: There are positive relationship between Social interaction and intention to play online games.

H11: There are positive relationship between PEOU and attitudes to playing online games.

H12: There are positive relationship between PEOU and Perceived usefulness to play online games.

H13: There are positive relationship between Attitude and intention to play online games.

H14: There are positive relationship between Subjective norm and intention to play online games.

H15: There are positive relationship between Perceived behavioral control and behavioral intention to play online games.

H16: There are positive relationships between behavioral intention to play online games and actual behavior.

Methodology

This research used a structural equation modeling (SEM) tool, WarpPLS (Kock), to measure the reliability and validity of data and to test the research model. Unlike covariance-based SEM tools such as LISREL, PLS has the flexibility to represent both formative and reflective latent constructs, and places minimal demands on measurement scales, sample size, and distribution assumptions (Chin, 1998). This is because the component-based PLS uses a least-square estimation procedure to obtain parameter estimates while LISREL uses a maximum likelihood function to do so (Chin, 2001)

This research summarizes characteristics of the respondents in Table 1. Overall, about 34.2% of the respondents are female and 65.8% are male.

Table 1: Characteristics of Respondent Students

Measure	Item	Percent
Gender	Male	65.8
	Female	34.2
Age (Years)	<9	1.9
	10-12	7
	13-15	15.2
	16-18	21.5
	19-21	18.4
	>22	36.1
Status	Single	97.5
	Married	2.5
Education	Not study	0
	Primary school	6.3
	Secondary school	45.6
	Vocational/Diploma	6.3
	Bachelor degree	41.8
Occupations	No work/housewife	0.6
	Agriculturist	0.6
	General contractor	0.6
	Work at private company	5.1
	Do business	0.6
	government official	1.9
	Student	90.5
Income (Baht)	0	77.8
	<10,000	17.1
	10,001-20,000	3.2
	20,001-30,000	1.3
	30,001-40,000	0.6
	>40,000	-

Table 1: Characteristics of Respondent Students

Measure	Item	Percent
Year of Internet	<1	2.5
experience	1-5	37.3
	>5	60.1
Objective for using	Communication	11.4
the internet	Buy/Sale	0.6
	Search data	49.4
	Community	-
	Entertainment	27.2
	Other	11.4
Place of playing	Home	45.6
online game	School	16.5
	Internet café	26.6
	Other	11.4

This research employed convergent and discriminant validity and internal consistency reliability (ICR) to evaluate the psychometric properties of the measures for the eleven latent constructs. The convergent and discriminant validity of latent constructs with reflective indicators can be assessed by using the following criteria.

1. The standardized item loadings (similar to loadings in principal components) should be no less than .707.
2. The items should load more strongly on their respective constructs than on other constructs.
3. The square root of average variance extracted (AVE) by a construct from its indicators should be no less than .707 (i.e., AVE should be no less than .50).
4. The square root of AVE should be larger than the correlations between that construct and all other constructs (Chin & Frye, 1998)

ICR, also known as composite reliability, is similar to Cronbach's alpha because both are used to measure reliability (Yi & Davis, 2003). ICR is computed from the normal PLS output using the formula: ICR = $(\Sigma\lambda i)2/[(\Sigma\lambda i)2+\Sigma(1-\lambda i2)]$, where λi is the standardized component loading of an indicator on its construct [Chin 1998]. ICR will be considered adequate if its value is no less than .70 (Barclay & Thompson..., 1995). Item loadings are obtained from the normal PLS output and cross-loadings are obtained by correlating eleven construct factor scores with all standardized item scores.

All thirty seven items exhibit high loadings (>.707) on their respective constructs and load more strongly on their respective constructs than on other constructs. Table 3 shows the results.

Table 3 presents ICRs, square roots of AVEs, and correlations among latent constructs. ICRs are all higher than 0.90, exceeding the recommended minimum reliability criterion (.70). AVEs are obtained by using the normal PLS output and the formula: $AVE=\Sigma\lambda i2/[\Sigma\lambda i2+\Sigma(1-\lambda i2)]$. All square roots of AVEs (on the diagonal in bold) are larger than .707 and than the correlations between that construct and all other constructs. In summary, the results in Tables 2 and 3 provide sufficiently strong evidence of reliability and convergent and discriminant validity of the measurement instruments.

Table 2: Loadings and Cross-Loading

	Attitude	Subjective norm	Perceived behavioral control	Flow experience	Perceived enjoyment	Perceived usefulness	Perceived ease of use	Social interaction	Human-computer interaction	Intention	Behavior	P value
ATU1	1.067	-0.07	0.011	0.074	-0.043	0.13	-0.082	-0.072	0.085	-0.302	0.116	<0.001
ATU2	0.936	0.055	0.083	-0.031	-0.249	-0.09	0.235	0.098	-0.154	-0.018	0.115	<0.001
ATU3	0.764	0.014	-0.097	-0.043	0.3	-0.039	-0.159	-0.028	0.073	0.324	-0.236	<0.001
SJN1	-0.006	0.748	0.033	0.123	-0.176	-0.088	0.256	-0.231	0.17	-0.01	0.147	<0.001
SJN2	0.089	0.895	-0.154	-0.053	-0.036	0.249	-0.103	0.181	0.033	-0.158	-0.074	<0.001
SJN3	-0.088	0.942	0.13	-0.067	0.214	-0.177	-0.146	0.039	-0.204	0.177	-0.068	<0.001
PBC1	-0.382	0.108	0.942	0.057	0.239	-0.215	0.124	-0.29	0.013	0.12	0.092	<0.001
PBC2	-0.106	0.084	0.934	-0.12	0.252	0.14	-0.382	0.415	-0.225	-0.151	0.07	<0.001
PBC3	0.52	-0.205	0.599	0.069	-0.524	0.079	0.278	-0.136	0.227	0.035	-0.172	<0.001
FE1	0.011	0.034	0.25	1.03	-0.526	-0.179	-0.069	0.106	-0.005	0.098	0.105	<0.001
FE2	-0.082	-0.035	0.158	1.001	-0.273	0.126	-0.173	-0.09	0.059	0.045	0.022	<0.001
FE3	-0.059	-0.087	-0.025	1.193	-0.108	0.023	0.044	-0.106	-0.247	-0.139	0.185	<0.001
FE4	0.065	0.023	-0.383	0.509	0.684	-0.117	0.21	-0.147	-0.1	0.342	-0.307	<0.001
FE5	0.079	0.079	-0.019	0.115	0.299	0.168	-0.005	0.269	0.343	-0.385	-0.025	<0.001
PE1	0.26	-0.036	0.12	0.018	0.778	-0.052	-0.013	-0.042	0.034	-0.163	0.035	<0.001
PE2	-0.008	-0.016	-0.088	-0.093	0.978	0.197	0.067	-0.094	-0.078	0.053	0.011	<0.001
PE3	-0.257	0.052	-0.035	0.073	1.017	-0.142	-0.053	0.135	0.043	0.113	-0.047	<0.001
PU1	0.007	0.158	-0.153	-0.267	0.589	0.563	-0.059	0.303	-0.172	0.001	0.017	<0.001
PU2	-0.029	-0.053	-0.098	0.127	-0.025	0.841	-0.063	-0.333	0.169	0.274	0.07	<0.001
PU3	0.122	-0.064	0.011	0.045	-0.16	1.107	-0.164	-0.077	0.047	0.102	-0.232	<0.001
PU4	-0.103	-0.026	0.239	0.068	-0.362	0.906	0.295	0.153	-0.068	-0.402	0.15	<0.001
PEU1	0.06	-0.056	-0.132	0.078	0.065	0.232	0.783	-0.024	-0.06	0.033	-0.046	<0.001
PEU2	0.037	0.054	0.059	-0.207	0.084	0.049	0.983	-0.013	-0.059	-0.06	-0.008	<0.001
PEU3	-0.098	0.002	0.072	0.135	-0.152	-0.285	0.967	0.038	0.121	0.028	0.055	<0.001
SI1	-0.136	-0.069	0.139	0.078	-0.106	-0.139	0.111	1.011	-0.152	-0.027	0.17	<0.001
SI2	0.106	-0.011	0.033	-0.117	-0.06	-0.063	0.198	0.859	0.01	0.03	-0.102	<0.001
SI3	0.034	0.064	-0.191	0.053	0.135	0.189	-0.343	0.889	0.105	0.151	-0.113	<0.001
SI4	-0.007	0.016	0.017	-0.01	0.031	0.014	0.027	0.945	0.036	-0.149	0.046	<0.001
HMI1	0.225	-0.01	-0.03	0.032	-0.1	-0.027	-0.003	0.031	0.883	-0.16	0.127	<0.001
HMI2	0.24	-0.028	0.083	-0.095	-0.063	0.093	-0.092	0.277	0.787	-0.212	-0.049	<0.001
HMI3	-0.239	0.027	0.036	-0.053	0.14	-0.005	0.076	-0.053	1.02	-0.131	0.124	<0.001
HMI4	-0.236	0.012	-0.093	0.121	0.025	-0.063	0.02	-0.266	0.998	0.525	-0.213	<0.001
INT1	-0.026	0.055	-0.237	0.062	0.181	-0.01	-0.055	-0.182	0.183	1.223	-0.362	<0.001
INT2	0.031	-0.084	0.059	-0.037	-0.095	-0.077	0.198	-0.008	-0.139	0.668	0.358	<0.001
INT3	-0.004	0.027	0.175	-0.025	-0.086	0.084	-0.137	0.186	-0.045	0.788	0.01	<0.001
BEH1	-0.013	0.014	-0.067	0.059	0.029	0.003	-0.063	-0.1	0.02	0.141	0.903	<0.001
BEH2	0.013	-0.014	0.067	-0.059	-0.029	-0.003	0.063	0.1	-0.02	-0.141	0.986	<0.001

Table 3: ICRs, AVE Square Roots, and Correlation among Latent Constructs

Latent Construct	ICR	AVE Square Roots (on-diagonal) and Correlation (off-diagonal)										
		Attitude	Subjective norm	Perceived behavioral control	Flow experience	Perceived enjoyment	Perceived usefulness	Perceived ease of use	Social interaction	Human-computer interaction	Intention	Behavior
Attitude	0.913	0.852										
Subjective norm	0.827	0.462	0.743									
Perceived behavioral control	0.773	0.711	0.4	0.688								
Flow experience	0.85	0.602	0.328	0.643	0.626							
Perceived enjoyment	0.913	0.79	0.329	0.782	0.69	0.852						
Perceived usefulness	0.881	0.503	0.492	0.552	0.628	0.581	0.739					
Perceived ease of use	0.898	0.753	0.367	0.709	0.65	0.834	0.646	0.831				
Social interaction	0.944	0.659	0.268	0.623	0.585	0.748	0.549	0.795	0.857			
Human-computer interaction	0.94	0.777	0.293	0.701	0.67	0.822	0.527	0.791	0.794	0.848		
Intention	0.874	0.726	0.415	0.678	0.59	0.733	0.709	0.773	0.733	0.752	0.798	
Behavior	0.879	0.622	0.344	0.574	0.479	0.628	0.594	0.645	0.526	0.556	0.741	0.892

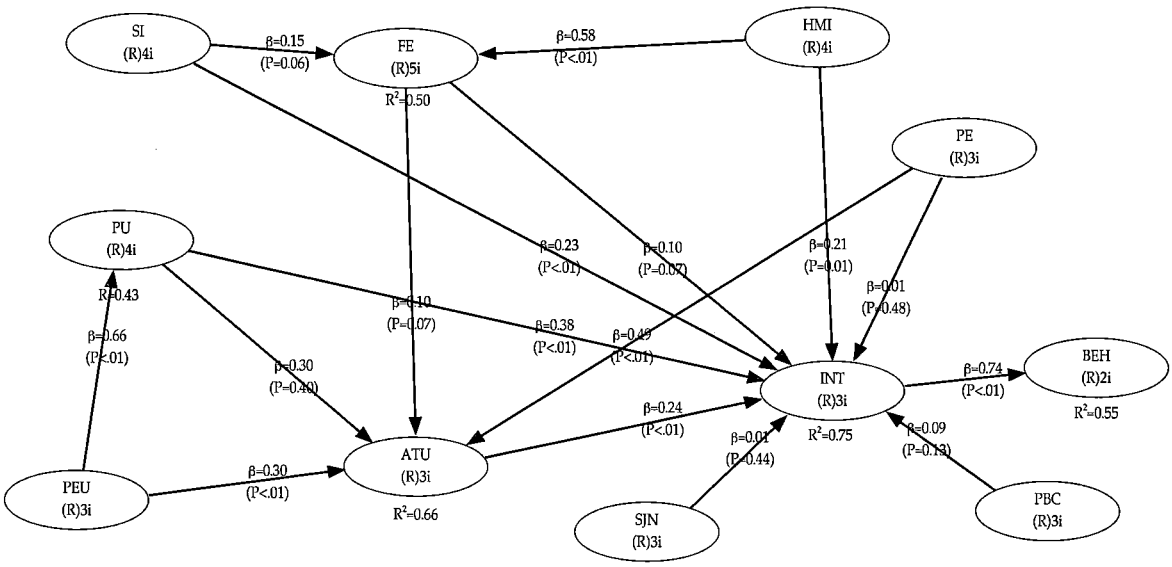

Figure 6: PLS Results

Table 4: Summary of Hypothesis Test Results

Hypothesis	β	P-Value	Support
H1. Perceived usefulness ® attitude	-0.031	0.401	No
H2. Perceived usefulness ® intention	0.381	<0.001	Yes
H3. Flow experience ® attitude	0.101	0.071	No
H4. Flow experience ® intention	-0.105	0.067	No
H5. Perceived enjoyment ® attitude	0.485	<0.001	Yes
H6. Perceived enjoyment ® intention	-0.009	0.479	No
H7. Human-computer interaction ® ow experience	0.581	<0.001	Yes
H8. Human-computer interaction ® intention	0.209	0.014	Yes
H9. Social interaction ® ow experience	0.154	0.06	No
H10. Social interaction ® intention	0.225	0.008	Yes
H11. Perceived ease of use ® attitudes	0.301	0.004	Yes
H12. Perceived ease of use ® Perceived usefulness	0.658	<0.001	Yes
H13. Attitude ® intention	0.239	0.005	Yes
H14. Subjective norm ® intention	-0.008	0.437	No
H15. Perceived behavioral control ® intention	0.086	0.127	No
H16. Behavioral intention ® actual behavior.	0.742	<0.001	Yes

The hypotheses are tested by examining path coefficients (similar to standardized beta weights in a regression analysis) and their significance levels in the PLS structural model. To examine the statistical significance of path coefficients, bootstrapping with 999 resample is performed to obtain estimates of t-statistic values (Kock).

Figure 6 shows path coefficients and significance levels for each hypothesis as well as the variances for the two dependent constructs: attitude toward playing and intention to play online games. Attitude toward playing online games, Perceive enjoyment, subjective norms, Perceived behavioral control, Flow experience, Human-computer interaction, Social interaction, and Perceived usefulness together explain 75% of the variance in intention to play the online game. Perceived usefulness, Perceived ease of use, Flow experience, and perceived enjoyment together explain 66% of the variance in the Attitude toward playing online games. Human-computer interaction and Social interaction together explain 50% of the variance in the flow experience. Intentions to play the online game explain 55% of the variance in the behavior intention to play the online game. Nine of the sixteen hypotheses are supported (see Table 5 for a summary of the results). Consistent with the predictions, perceived usefulness has a significant effect on intention to play as well as on human-computer interaction, social interaction, attitude toward playing online games, thus supporting Hypotheses 2, 8, 10 and 13. Perceived enjoyment and Perceived ease of use have a significant effect on attitude toward playing online game, supporting Hypothesis 5 and 11. Consistent with Hypothesis 7, Human-computer interaction has a significant effect on flow experience. Perceived ease of use has a significant effect on Perceived usefulness, supporting Hypothesis 12. Consistent with Hypothesis 16, intention to play online game has a significant effect on actual behavior to play online game. Inconsistent with Hypothesis 1 and 3, Perceived usefulness and flow experience does not affect attitude toward playing online games. Inconsistent with the predictions, Flow experience does not a affect intention to play as well as perceived enjoyment, subjective norm and perceived behavioral control, thus supporting Hypotheses 4, 6, 14 and 15. Finally, social interaction does not affect flow experience, thus supporting Hypotheses 9.

Discussion

Summary of Results

The current study shows that Perceived usefulness, Human-computer interaction, Social interaction and attitude toward playing online games have an impact on intention to play online games. Attitude toward playing online games is the strongest predictor of intention to play. Both perceive enjoyment and perceived ease of use greatly affect attitude toward playing online games.

Contribution and Key Insights

Online game developers need to investigate that Perceived usefulness, Human-computer interaction, Social interaction and attitude toward playing online games build strategies that might assist in engaging players. This research suggests that game developers should consider more on establishing Perceived usefulness, Human-computer interaction, Social interaction and attitude toward playing online games and exert important influences in players' intentions to play online games in their marketing strategies. This research highlights the factors influencing intention behavior expected and Hybrid Models for Technology Acceptance.

This study contributes additionally to the literature on hybrid Models for Technology Acceptance by confirming that interaction, as one of the most important aspect related to flow experience with computer games(Lewinski, 1999).

Limitations

As with other survey research, interpretation of this result is subject to certain limitations. First, Almost participants use the internet for search data some one don't like playing the online game. Second, Almost participants playing the online game at home then the influence of subjective norm is insignificance.

Conclusion

In conclusion, this study was conducted to examine factors influencing behavioral intention in playing online games. The research model and hypotheses are based

on combined TPB and TAM. The survey was conducted with the youth at an educational institution and was found to support nine of the sixteen hypotheses. The results of this study confirm the important roles of Perceived usefulness, Human-computer interaction, Social interaction and attitude toward playing online games in predicting behavioral intention. The insignificance of the link from flow experience, perceived enjoyment, subjective norms, and perceived behavioral control to intention indicates the need for further research in the context of online gaming.

References

Adams, D. A., Nelson, R. R., & Todd, P. A. . (1992). Perceived usefulness, ease of use, and usage of information technology: a replication. *MIS Quarterly, 16*(2), 227–247.

Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior.* New York: Springer Verlag.

_____. (1991). The Theory of Planned Behaviour. Organisational Behaviour and Human Decision Processes, *50,* 179-211.

_____. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of Planned Behavior. *Journal of Applied Social Psychology, 32*(4), 665–683.

Barclay, D., Higgins, C., & Thompson R.(1995). The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration. *Technology studies, 2*(2), 285-309.

Chan, E., & Vorderer, P. (2006) Massively multiplayer online games. In P. Vorderer & J. Bryant (Eds.), *Playing video games: Motives, responses, and consequences* (pp. 77-90). Mahwah: Lawrence Erlbaum Associates.

Chin, W. W. (1998) The partial least squares approach for structural equation modeling. In G. A. Macoulides (Ed). *Modern methods for business research* (pp. 295-336). Lawrence Erlbaum Associates: Mahwah, NJ.

Chin, W. W. (2001). *PLS-Graph User's Guide Version 3.0.* Houston, TX: C.T. Bauer College of Business, University of Houston.

Chin, W., & Frye, T. (1998). *PLS-Graph (Version 2.91. 03.04)*[Computer software]. Calgary, Alberta, Canada: University of Calgary.

Choi, D., & Kim, J. (2004), "Why people continue to play online games: in search of critical design factors to increase customer loyalty to online contents". *Cyberpsychology & Behavior, 7*(1), 11-24.

Chris, C. (1984). The Art of Computer Game Design. Osborne: McGraw-Hill.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly, 13,* 319–340.

Fetscherin, M., & Lattemann, C. (2008). User acceptance of virtual worlds. *Journal of Electronic Commerce Research. 9*(3), 231-242.

Fishbein, M., & Ajzen, I. (1975). Beliefs, Attitude, Intention and Behaviour: An Introduction to Theory and Research.

Gorriz, C., & Medina, C. (2000). Engaging girls with computers through software games. *Communications of the ACM. 43*(1), 42-49.

Hua, G., & Haughton, D. (2009). Virtual worlds adoption: a research framework and empirical study. *Online Information Review. 33*(5), 889-900.

Huang, M. H. (2003). Designing website attributes to induce experiential encounters. *Computers in Human Behavior, 19*(4), 425–442.

Jimming, W., & Liu, D. (2007). The Effect of Trust and Enjoyment on Intention to Play Online Games. *Journal of Electronic Commerce Research. 8,* 128–140.

Keil, M., Beranek, P., & Konsynski, B. (1995). Usefulness and ease of use: field study evidence regarding task considerations. *Journal Decision Support Systems - Special issue on user interfaces archive, 13*(1), 75-91.

Kim, y.-y., Oh, S., & Heejin, L. (2005). What make people experience flow? Social characteristics of online games. *International Journal of Advanced Media and Communication, 1*(1), 76–92.

Kock, N. WarpPLS 1.0 User Manual. Retrieved from http://www.scriptwarp.com/warppls/UserManual_WarpPLS_V3_Redirect.pdf

Laurel, B. (1993). ComputersasTheater. NewYork: Addison-Wesley.

Lee, M. (2009). Understanding the behavioural intention to play online games. *Online Information Review, 33*(5), 849 - 872.

Lewinski, J. S. (1999). *Developer's guide to computer game design.* Wordware Publishing Inc.

Lu, Y., Zhou, T., & Wang, B. (2009). Exploring Chinese users' acceptance of instant messaging using the theory of planned behavior, the technology acceptance model, and the flow theory. *Computers in Human Behavior, 25*(1), 29–39.

Pilke, E. M. (2004). Flow experiences in information technology use. *International Journal of Human-Computer Studies, 61*(3), 347-57.

Sun, H., & Zhang, P. (2006). The role of moderating factors in user technology acceptance. *International Journal of Human-Computer Studies, 64*(2), 53-78.

Taylor, S., & Todd, P. A. (1996). Understanding information technology usage: a test of competing models. *Information Systems Research, 6*(2), 144–176.

Voiskounsky, A. E., Mitina, O. V., & Avetisova, A. A. (2004). Playing online games: Flow experience. *PsychNology, 2*(3), 259–281.

Yi, M., & Davis, F. (2003). Developing and validating an observational learning model of computer software training and skill acquisition. *Information systems research, 14*(2), 146-169.