FACTORS AFFECTING USE OF GAMIFICATION BY UNDERGRADUATE STUDENT

Wasin Liampreecha[1*], Maneerut Chatrangsan[2] and Charles Allen[3]
[1*, 2, 3] Faculty of Business, Economics and Communications, Naresuan University, Phitsanulok, Thailand
Email: wasinl@nu.ac.th[1*]

ABSTRACT

Gamification uses techniques in the form of games without using the game itself. To be something that helps to motivate and motivate learners. Engage learners in learning in a fun way. Simple to use game mechanics as operators. Gamification attracts the learners to develop behavioral checks, improve and find solutions to problems. The objectives of this research were 1) to study the factors that influenced the use of business simulation game by the undergraduate students in Business Computer 2) to study the relationship between perceived usefulness, perceived ease of use, and perceived enjoyment towards attitude to use business simulation game, and 3) to study the attitude to use towards the behavioral intention to use business simulation game strongest determinants that influenced the students' attitude to use business simulation game. Fifty-eight NU undergraduate business computer students enroll the course 231461 Enterprise Systems in Term 1 in 2019 to answer 58 questionnaires. Data analysis used percentage, mean and standard deviation to test the hypothesis with Pearson Product Moment Correlation Coefficients and multiple regression.

This study showed that the acceptance factors of using computer game simulating business situations affecting 4th- year undergraduate students' attitude in business computer—faculty of Business Administration Economics and Communication Naresuan University at a high level. Perceptions and attitudes in using business simulation computer games significantly related at the level 0.01 level and attitudes towards use influenced behavioral intention in using simulation computer games. Business with a significant level of 0.01

KEYWORDS: 1) TECHNOLOGY ACCEPTANCE MODEL 2) GAMIFICATION 3) UNDERGRADUATE STUDENT

[1] Assistant Professor of Business Administration Department, Faculty of Business, Economics and Communications, Naresuan University

[2 , 3] Lecturer of Business Administration Department, Faculty of Business, Economics and Communications, Naresuan University

Introduction

Nowadays, computer game technology has increasingly played a role in teaching and learning. Especially business simulation games at many universities in Thailand, they have taught practical work in subjects related to business operations AEC10NEWS reported earlier in 2020 that Thailand's number one oil company has signed a cooperation agreement with Eastern Universities. In education for human resource development. The intention of bringing knowledge and expertise in doing business in conjunction with education develop an education platform for human resource development. This is the cornerstone for developing the country to be stable and sustainable. Wawer et al. (2010) concluded that the business simulation computer game is a useful learning program to manage business processes in modern organizations. Business simulation computer games have become a popular educational tool because participants can learn many useful skills, such as individual participation, teamwork, strategic thinking, and analysis, including communication.

Technology has been developed to change the lives of users for the better. Industries are continually developing new technologies to improve the efficiency of their users. It is wasteful if the end-user does not accept new technology, so the inventor or marketer of the technology needs to know the factors that motivate the user to use the technology. It affects students' use of computer games to simulate business situations. This study has adopted the Technology Acceptance Model (TAM) as a theoretical research framework.

Background of research problems

There are currently studies on factors affecting the use of computer games in business simulation as a user study tool, especially in Thailand (Sitiwong, 2017; Netsawang, 2016; Peandee & Pasawano, 2015). It is because computer games, business simulation are new in the higher education environment of Thailand. Tao et al. (2009) noted that business simulation computer games had become popular tools for informal learning. Because of this era, many technologies using in their daily lives. For example, in Thailand, e-learning has been widely accepted and used by students, so this research. It intends to fill knowledge by explaining the factors and attitudes that affect computer games' use to simulate business situations among undergraduates.

To make the research more complete, the researcher then applied the Technology Acceptance Model (TAM) framework has applied in various research areas such as web-based content management systems (Ngai et al., 2007), hands-on trading. Hold (Wu & Wang, 2005), online banking (Pikkarainen et al., 2004), web-based teaching (Al-Adwan et al., 2013; Roca et al., 2006). Besides, the TAM concept was applied to the measure of attitudes towards business simulation games, although the business simulation games are limited (Tao et al., 2011). Monsoonsim's business simulation computer game was the program of choice in this research. Because it is a simulation game-planning the use of enterprise resources (Enterprise Resources Planning: ERP), this program can simulate a business's structure. For students to study, plan, connect by creating a model company and operate the business of production and distribution choosing to produce fruit juice boxes of three flavours, three sizes, and retail and wholesale. This program Includes the following business modules: Production, Marketing and Sales modules, human resource management module and accounting and finance modules. Therefore, this research aims to study the factors of adopting business simulation game technology that directly affects business computer simulation usage.

Research objectives

This research aimed to 1) study the factors of adopting computer games simulating business situations affecting the fourth-year undergraduate students' attitude in business computing. Faculty of Business Administration Economics and Communication Naresuan University 2) to study the relationship between perception and attitude in using computer games to simulate business situations. To study attitudes toward behavioral intentions in computer games for business simulation and 3) to study the acceptance of new business simulation computer games. Through the Technology Acceptance Model: TAM)

Literature review

A literature review for this research. Based on the concepts and theories of the Davis et al. (1986) Technology Acceptance Model as a conceptual framework for research, it comprises of the perceived benefit factor. Intuitive perception of enjoyment Attitude towards use behavioral intentions and computer games simulating business situations. The researcher has reviewed the relevant literature.

Technology acceptance model

Davis et al. developed the Technology Acceptance Model, or TAM, in 1986. The model was built based on the theoretical model of human behavior (Fishbein, 1967; Fishbein & Ajzen, 1975) or the Theory of Reasoned Action.: TRA). TAM theory has been cited more than 700 times (Tao et al., 2009) and is widely used in various fields of study, such as the web content management system (Ngai et al., 2007), operates. Mobile business (Wu and Wang, 2005), online banking (Pikkarainen et al., 2004), web-based teaching (Roca et al., 2006), and many others. This model can help technology innovators understand. Factors Affecting User Technology Acceptance of Newly Developed Technologies. The TAM model is comprised of four factors, including perceived benefits and perceptions of ease of use. These two factors influence the attitude of use. Moreover, the attitude towards use also affects the behavioral intentions of use.

Perception of benefit

Perception of benefit is the extent to which individuals are confident in using a specific system that increases people's productivity (Davis et al., 1989). Despite the development of new technologies, consumers are skeptical and use it. Especially technology is not well established. In many studies, the perception of benefit was a key factor in user attitudes (Ngai et al., 2007; Park, 2009). Therefore, the relationship between perceived benefits and attitudes towards use was studied. Beyond that, Davis et al. (1989) believed that feelings, whether negative or positive, arising during the intention to use the system would motivate people to continue using the system. If the system optimizes their work, this research will examine the relationship between perceived benefit and intention of behavior to be used.

Intuitive perception

The perception of ease of use is the extent to which an individual thinks and believes that less physical and mental effort is needed to use a specific system (Davis et al., 1989). Its use profoundly affects user acceptance of the technology (Al-Adwan et al., 2013; Ngai et al., 2007). People will be more optimistic, so this study aims to lead the findings by defining the effect of intuitive perceptions on user attitudes in computer games. Business

Perception of enjoyment

Lee et al. (2005) are perceived enjoyment addresses the factors involved in the processes of human and social transformation integrated into TAM. This helps to explain better about factors of adaptation in information technology. True motivation means activities are interesting and satisfying in some way, so it is associated with a perceived

enjoyment, the idea of which is an activity that is enjoyable (Lee et al., 2005). This factor is included in Cheng's et al. study (2003) and Tao et al. (2009), where enjoyment and attention are some elements that should be evaluated. In addition to their studies, Wawer et al. (2010) noted that computer games simulate business situations. It is regarded as one of the most interesting forms of education. And it is proof in research that Almost half of the respondents identified computer games as a form of enjoyment. The perception of enjoyment is one factor that affects the attitude of users. Another relationship is the relationship between the perception of enjoyment and the behavioral intention to use. According to Davis et al. (1992), the perception of enjoyment provides another perspective that significantly affects the intention to use. Therefore, without considering the perceived benefits, this study aimed to study the relationship between perception of enjoyment and behavioral intention to use.

Attitude towards use

Attitude towards use is Judgment: Evaluation of the target behavior in terms of certain dimensions, for example, good versus bad, harmful versus favorable versus unpleasant, etc. (Holden & Karsh, 2010). Recognition of both of this ease of use. Is a factor that determines attitude towards use, which affects the intention of the behavior to use, so this study would like to review the relationship between attitude towards use and behavioral intention in use.

Behavioral intentions

Behavioral intent is the driving force or willingness of an individual to achieve a target behavior (Holden & Karsh, 2010). This can be translated into the level of acceptance of the technology by the end-user. In this study, many of the questionnaire questions assess whether the user intends to use the technology.

Business simulation computer game

Business simulation computer games or gamifications are computer games that educate or are intended for training players to manage business activities effectively and decision-making processes within the business environment simulation, as concluded by Wawer et al. (2010). It is noted that business simulation computer games are one of the most effective ways to improve business process management knowledge in the most modern organizations of the time. There are two types of business simulation computer game users: Business users and students (Faria, 1998; Tao et al., 2009; Wawer et al., 2010), according to Faria (1998), Companies that use business simulation computer games as a training tool are large corporations. Other users who have been reviewed widely and comprehensively. Most of them are students. This is because students can develop a wide range of skills, such as individual participation. Teamwork Includes strategic thinking and analysis In this research, and the user is a fourth-year undergraduate student applying for a computer game. Business simulation is one of the methods of contemporary education. And it is because students have been passed on their knowledge in business practice before Students can also imitate more real-world situations. When it comes to computer games

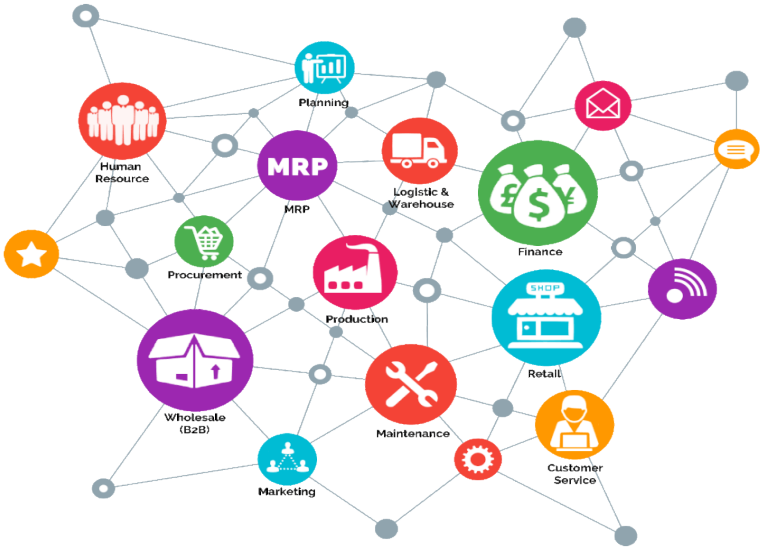
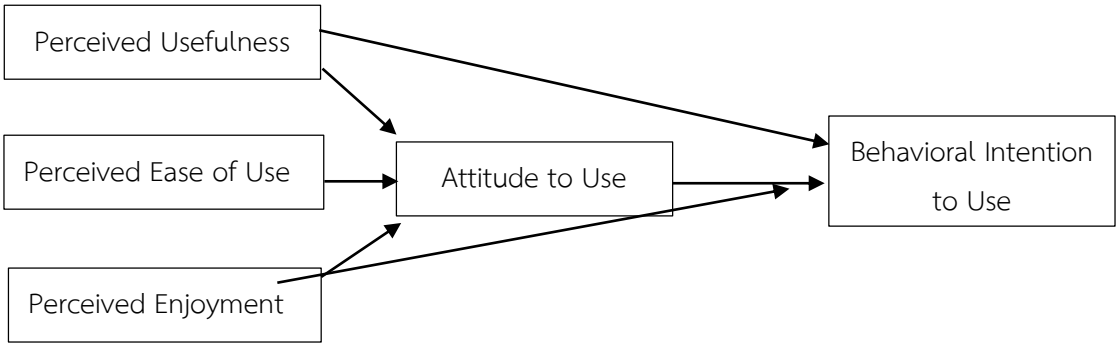


Figure 1: Business simulation game business module
Source: www.monsoonsimthailand.com

Research framework



Research Methodology

Methods for conducting this research use quantitative methods. Use questionnaires to collect data because questionnaires are suitable for a quantitative survey. This study was a cross-sectional study because the data were collected only once. Finally, the data is analyzed in detail in a deduction.

Samples and Collection

This research performed at the Faculty of Business Administration Economics and Communication Naresuan University a total of 58 subjects were students in the 4th year in Business Computer. Enrolled in courses 231461 Organization Management with content about organizational resource planning in the first semester of the academic year 2019, choosing this class of students is because he is a business computer student who has experience in using computer games in business simulation.

Data analysis

The descriptive data analysis from questionnaires was designed as a rating scale with a scale of 1-5 weights, separately measured and then analyzed the static by using mean and standard deviation, all items.

The researcher also used inferential analysis to test the hypothesis. Using two types of inferential analysis statistics: Pearson correlation and multilevel linear regression according to Kumar et al. (2013). Pearson correlation was used to measure the degree of linear association between two variables. On the other hand, multiple linear regression analyses the relationship between a single dependent variable with more than one independent variable.

Research instruments

A questionnaire developed from previous research by Venkatesh and Davis (2000), Ngai et al. (2007) and Liaw (2008), contained questions on the technology acceptance of Davis et al. (1989), consisting of a perceived benefit variable. The perception that it is easy to use perception of enjoyment, attitudes towards use and the intended use of 17 questions and 58 questionnaires were used to collect the data.

Three experts performed the analysis of the validity of these 58 questionnaires to consider and verify the Index of Item Objective Congruence: IOC to obtain an IOC value of 0.60 which is considered valid (Surapong Kongsat and Teerachat Thammawong, 2008). Next the researcher then used all the questionnaires to determine the confidence value by analyzing it with Cronbach's Alpha value was concluded as follows. The perception factor achieved a confidence factor of 0.799, followed by the attitude towards use. A confidence factor of 0.774 was obtained for the behavioral intention factor. Obtained a confidence factor of 0.770 and a perceived confidence value of 0.754, a perceived confidence factor as easy to use of 0.711, which tested the reliability of 17 questions. of all questionnaires, Cronbach's alpha value was not less than 0.70 (Nunnally, 1978). All the questions in the questionnaire had an acceptable level of confidence.

Results

Study results on factors affecting the use of business simulation computer games for undergraduate students in Business Computing objective are to study the factors affecting the use of computer games in business simulation affecting the attitude of use through the technology acceptance model found that the sample of 58 respondents, more than half of them were female students, 51.7 percent followed by male students' 48.3 percent.

Table 1 summarizes the mean and standard deviation of the technology acceptance.

Items	$\bar{x}$	S.D.	Level
Perceived Usefulness	4.19	.488	Highly
Perceived Ease of Use	3.37	.589	Average
Perceived Enjoyment	4.04	.609	Highly
Attitude to Use	3.92	.635	Highly
Behavioral Intention to Use	3.87	.599	Highly
Total	3.88	0.584	Highly

Table 1 showed that students' opinions on the overall technology acceptance were at a high level ($\bar{X}$ = 3.88, SD = 0.584), separated by the side, in descending order as follows. The perceived benefit was at a high level (($\bar{X}$ = 4.19, SD = 0.488). Students had a high level of perceived enjoyment (($\bar{X}$ = 4.04, SD = 0.609) Students had a high level of attitude towards use (($\bar{X}$ = 3.92, SD = 0.635). High level (($\bar{X}$ = 3.87, SD = 0.599) and students commented that the perceived ease of use was moderate (($\bar{X}$ = 3.37, SD = 0.589).

Table 2 Pearson correlation analysis

The relationship between variables	Pearson Correlation	Sig.2-tailed)
Perception of enjoyment with an attitude towards the use	.617	.000**
Perceptions that there are benefits to attitudes towards use	.341	.009**
A perception that it is easy to use with an attitude towards use	.780	.000**
Perceptions are useful for behavioral intentions	.548	.000**
A perception is easy to operate with behavioral intentions	.401	.002**
Perception of enjoyment with behavioral intention	.644	.000**

The relationship between perceived benefits and attitudes towards the use of computer games in business simulation.

From Table 2, the perception of benefit was positively correlated with the attitude of using computer games in business simulation because the r value was 0.617; the strength of this relationship was moderate. The correlation is significant because the p-value is less than 0.01.

Relationship between perceived benefit and behavioral intent in the use of business simulation computer games.

From Table 2, the perception of benefit was positively correlated with the behavioral attitude of the use. Moreover, this is significant because the p-value is less than 0.01; this relationship's strength is moderate since the R-value is 0.548.

The relationship between perception of ease of use and attitude towards the use of business simulation computer games.

Table 2 illustrates that the perception of ease of use was positively correlated with the attitude of using computer games in business simulation. This relationship's strength is small since the R-value is 0.341, but the correlation is significant because the p-value is less than 0.01.

The relationship between perception of enjoyment and attitudes in using computer games in business simulation.

Table 2 also shows that the perception of enjoyment was positively correlated with the attitudes of using computer games in simulating business situations. The relation is significant because the p-value is less than 0.01, the R-value is 0.780, therefore the correlation is high.

The relationship between Perception, Enjoyment and Behavioral Intention in Using Computer Games for Business Simulation

From Table 2, the perception of enjoyment was positively correlated with the behavioral intention of using computer games to simulate business situations. The correlation is significant because the p-value is less than 0.01, the R-value is 0.644, so it is a moderate correlation.

The relationship between usage attitudes and behavioral intentions in the use of business simulation computer games.

Table 2 shows that the attitudes in using computer games simulate business situations. There was a positive correlation with behavioral intent in the use of business simulation computer games. This relationship is significant because the p-value is less than 0.01. The strength of this relationship is moderate since the R-value is 0.646. The

relationship of perceived benefit Perception of ease-of-use perceptions of enjoyment and attitudes in computer games in business simulation.

This analysis is performed to assess in more detail the relationships between independent variables. (Perception of benefit Ease of use, variable based on (attitude towards the use of computer games, business simulation, in addition to identifying the elements of the technology acceptance model that most affect students' attitudes in the use of computer games business simulations.

The relationship of perceived benefit Intuitive perception and the perception of enjoyment and behavioral intention

This analysis is performed to assess in more detail the relationships between independent variables. (Perception of benefit, perception of ease of use and perception of enjoyment) According to (intention Behavior in using computer games to simulate business situations. In addition to identifying the technology acceptance model elements, it has the greatest effect on student attitudes in using computer games in business simulation.

Table 3 The results of the multilevel linear regression equations.

Model	R	R Square (R^2)	Adjusted R Square	Std. Error of the estimate
1	.815	.664	.645	.36255

Table 3 shows the R-value of the relationship mentioned, 0.815, which means 81.5% of the user's intelligence using the business simulation computer game. This can be expected from the perceived benefits. The perception that it is easy to use and the perceived enjoyment with R2 of 0.664 means 66.4% of the change in user attitudes toward running a business simulation game. Is affected by independent variables.

Table 4 Analysis of multiple regression equations

Model	Unstandardized Coefficients		standardized Coefficients Beta		
	B	St. Error	β	t	Sig.
1 (constant)	.416	.437	-	.952	.345
The perception of useful	.341	.119	.723	2.853	.006**
The perception of easy to use	-.108	.095	-.104	-1.129	.264
The Perception of enjoyment	.653	.100	.681	6.554	.000***

Discussion

From research on factors affecting the use of business simulation computer games for undergraduate students in business computing can debate whether the adaptation factor for business simulation computer game use had a significant effect on usage attitudes of 0.01, consistent with research by Ngai et al. (2007) Park (2009) and Yatim (2018) that students perceive. That business simulation computer games are one of the learning tools useful if they can be used to improve their learning. However, this study found results that differ from a study by Al-Adwan et al. (2013) because Students are happy to use computer games and business simulations. Nevertheless, the benefits must be considered. Therefore,

after using a computer game in a business simulation Students will recognize that it is a good learning system because it can improve their learning efficiency.

The relationship between perception and attitudes in using computer games in the business simulation was significantly correlated at a significant level of 0.01 to study attitudes towards behavioral intentions in computer games simulating business situations. This is consistent with the findings of Davis et al. (1989) Lee et al. (2005) Amoako-Gyampah, (2007) and Ngai et al. (2007), but also conflicts with the Park (2009) study that said. It is because university students have recognized the system's benefits since, they learned them in high school. Hence, the perceived benefit has no significant correlation with the behavioral intentions of running a business simulation computer game. and

The perceptions of enjoyment and attitudes in the use of computer games in the business simulation were correlated at a significant level of 0.05, the results of this relationship consistent with previous research (Dickinger et al., 2008; Van der Heijden, 2003) That can be concluded that the cognitive effect influences the attitude of use and is consistent with the benefits that are received. Besides, the study's portal has enjoyable functionality, so perception is considered an integral component. Important Portals are like business simulation computer games. Where enjoyment has a great impact on user attitudes for use, students view business simulation computer games as a fun learning system.

The adaptation of a new business simulation game Through the Technology Acceptance Model (TAM) showed a significant correlation of 0.01. This correlation is consistent with research by Al-Adwan 2013), Ngai et al. (2007) and Park (2009). The perception of ease of use had a profound effect on using computer games in business simulation. However, the study found that Have a little relationship. This is in line with Hwang & Cruthirds (2017) research, which says that some students feel that the ERP system used in business simulation computer games is complex, so this phenomenon affects students' attitudes to using computer simulation business situation as well.

The relationship between cognition and behavioral intent in the use of business simulation computer games was significantly established at a 0.05 level, consistent with previous studies (Dickinger et al., (2008) and Lee and The Faculty (2005), who says that any technology that is meant for young people should have fun and enjoyable functions to encourage users to use it with recommendations related to computer games business simulation. As the target market is made up of universities or tertiary institutions, it also includes an enjoyment function due to many respondents in this stud agree that using this system is so much fun that time flies. It is also consistent with Chang et al. (2003), where students commented that business simulation computer games are interesting. Moreover, proven to have other essential elements (In addition to perceived benefits and use attitudes) affecting intentions and behaviors to use the computer game system to simulate business situations.

Recommendation

This research points out that computer game developer business simulation. The factors that motivate users to use this technology must be considered in consideration of its benefits. Perception of ease of use the perception of enjoyment and attitude to use These factors are included in the consumer perspective, which is one of the external factors' developers should consider during the development of new technologies. Doing so to increase user intentions of business simulation computer games. Besides that, this education has implications for higher education. Computer games simulating business situations used as educational tools can be advantageous if there are various factors, such as perceiving benefits Intuitive perception and perception of enjoyment. Moreover, perceived enjoyment is the most important factor of attitudes to use. The research results

can help this institution. Realize the importance of perceived enjoyment in a new learning system. However, the system may be difficult to learn or understand by first time users. Nevertheless, students are welcome to use them if they perceive enjoyment. For example, the perceived factor of enjoyment can be in the form of using a computer. The younger generation is more likely to use computers to learn. Therefore, computer games simulate business situations. Therefore, there is a high level of enjoyment due to the use of computers in teaching.

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