

# ANTECEDENTS AND CONSEQUENCES OF EXCESSIVE ONLINE SOCIAL GAMING: ON TEENAGERS

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## Abstract

This research is going to study the antecedents and consequences of excessive online social gaming among teenagers and it will be conducted from a social learning perspective. The research will also allow colleges, universities, NGO companies, social work organizations to recognize the individuals who hold these characteristics that would eventually lead to the effects of excessive online gaming. Organizations will have a good idea to promote knowledge in society with the correct ideas, statistics, and study program. This will also be helpful in recognizing that, in this time frame, researchers would understand that individuals should be provided the particular setting in which they can apply their thought process and come up with a concrete strategy to strengthen the situation and also recognize more factors that are causing the effects of excessive online gaming. 200 participants are participated in this research by giving supporting messages to allow further understanding of the potential prospects of excessive online social gaming.

Keywords –Social Learning

## I. INTRODUCTION

This research will be about the antecedents and consequences of excessive online social gaming and it will be conducted from a social learning perspective. Online social gaming is a form of gaming that permits for social interactions to take place among users within a fantasy gaming environment and this form of gaming has started to increase in popularity for the past 10 years [1]. However, many have viewed the increasing presence of online social gaming as having its pros and cons [2]. Despite its negativity, online social gaming is observed to help advance and promote the creation and nurturing social relationships as well as helping to enhance solidarity between friends [3]. The role of social background and social climate in promoting the inappropriate use of technology by users has been largely ignored, especially in the context of online social gambling. Hence, because of its theoretical importance, the first purpose of this analysis is to investigate social antecedents of excessive online video gaming. An inquiry into the social context of excessive video gaming online provides an opportunity for study to change the current focus on socio psychological contexts to video histories on inappropriate use of technology. Compared with studies investigating antecedents of excessive use of technology, fewer studies have looked at the negative effects of excessive use of technology in the IS research community as per stated by [4] pass studies referred by [5], [6] stated that only six studies addressing this issue emphasize the role of adverse effects in the discipline of IS. Although this is an informative start, these studies do not pose a simple taxonomy of the negative effects of excess technological use. In addition, these studies concentrate mainly on identifying the adverse effects of excessive usage of cell phones and social networking sites, while completely disregarding the adverse consequences of excessive video gaming online. This research will be held in Malaysia on students, online gamers, doctors, and teachers. Past studies have been performed by most countries such as China [5],

[6],[7], South Korea, Malaysia, China and United States. The underlying purpose of this study is to identify the consequences that causes excessive online gaming and how impactful it is becoming in a negative way will be discussed in this research.

## II. Literature Review

### 2.1 Excessive online social gaming

Excessive online social gaming can be defined in terms of excessive technology use and this captures the degree to which a user would perceive the amount of time spent using a certain technology, such as online social gaming in an excessive way [8]. In essence, excessive technology use usually involves a transitioning phase between normal utilisation of technology and addiction the technology. Past studies about excessive technology utilisation makes the assumption that users have a certain degree of awareness of the excessive amount of time which they spend using the technology but much of this research does not talk about whether such users make an attempt to control its use [9].

Excessive social gaming online means users spend a considerable amount of time playing social games online. The more time people spend playing video games online, the less time they have left to take part in family life as stated by [4]. some studies such as [6] [10] stated that regardless of whether inappropriate video games should be categorized as addictive, there is now a fairly large number of studies both suggesting that excessive online gaming should lead to a wide range of negative psychosocial effects for a minority of people affected. In severe cases, which can include sacrificing work, schooling, leisure, socializing, partner / family time, and sleep; increased stress; loss of real-life relationships; decreased psychosocial well-being and loneliness; weaker social skills; decreased academic achievement; increased attention; aggressive behavior. [10].

### 2.2 Literature Review of the Variables

#### 2.2.1 Relationship between social frequency and excessive online social gaming

The social learning theory states that the deviant behaviour of a particular user is capable of being affected by various observational learning mechanisms and this is through essentially making an observation of the actions of others, such as irrational observational learning, or even looking for the opinions of others, which in this case would be rational observational learning [11]. In this empirical study, social frequency is operationalised as observing the actions of others in this case, it makes reference to the gaming frequency of referrals that are labelled as socially important [12]. Observation of the actions of others as a social frequency referring to the gaming frequency of socially important referents These reference groups comprise one's friends, family, colleagues and other members of the gaming community [13]. A high degree of social interaction in online video game communities means users are exposed to people who also spend a considerable amount of time playing competitive games online. Under these conditions, users are likely to follow these significant social guidelines and spend a large amount of time playing online the cycle of self-regulation and eventually the transformation into excessive online social gaming as stated by [14]. Researchers like Kwon et al., [15] have made the observation that very heavy online social gaming would slowly and steadily start to have the effect of distorting the self-regulation process of the uses and this would then result in the ultimate transformation into excessive online social gaming by the user. The studies identified in this discussion concerning the variable of social frequency and its relation to excessive online social gaming shows that many of these studies find a positive association between these variables. However, the studies were not carried out in the Malaysian context which means that the research gap is very apparent here and which the researcher will want this gap be filled by testing the relationship between social frequency and excessive online social gaming in the Malaysian context. From the analysis of literature here, the researcher will create the following hypothesis for this study.

### **2.2.2 Relationship between social norm and excessive online social gaming**

According to past studies in this area such as those carried out by Lowry et al., [12], the seeking of the opinions of others in the context of this research will be operationalised as social norms and this makes reference to the social compliance expectation from socially essential referents when it comes to the playing of online social games. When it comes to making a selection, a user would be able to learn not by merely making an observation of the action of others but also to look for the opinions of others as well. In essence, the opinions that come about from social influence are very influential and can provide these users with a great amount of information support and approval when they are displaying a certain behaviour. A high degree of social norm in online social gaming communities means that users are subjected to a social environment in which the majority of people perceive social gaming as advantageous and beneficial. If users are individualized in a social environment that encourages social gaming, they prefer to control their social gaming frequency based on social norms rather than internal expectations and values. Excessive online social gaming, which the general public finds unethical or deviant, may also be justified as 'acceptable' on the basis of societal norms and standards [4]. This kind of a de-individuation effect would have the outcome of diminishing the ability of a user to self-regulate themselves in order to adjust the social gaming frequencies and this would then have the ultimate outcome of resulting in excesses in online social gaming. Studies that were discussed here show that the variable of social norm does have a positive association with excessive online social gaming. Once again, there is a very evident research gap in this literature that was discussed here and this is the fact that no studies were done about the relationship between these variables from a Malaysian context. Therefore, the researcher aims to provide a new empirical contribution to this body of literature by providing new insights about the relationship between social norms and excessive online social gaming from a Malaysian perspective.

### **2.2.3 Relationship between perceived enjoyment and excessive online social gaming**

According to the social learning theory, it is proposed that the deviant behaviour of users who take part in online social games is reinforced and enhanced through the learning process via the acquisition of rewards. This is labelled as positive reinforcement learning. It is also enhanced by the eradication of punishment and this is termed as the negative reinforcement learning [16]. For the purposes of this study, the provision of rewards will be operationalised in terms of perceived enjoyment. The variable of perceived enjoyment makes reference to the degree that a person playing online social games is capable of enjoying a sense of pleasure fulfilment for the own selves [12]. There are a number of past studies such as those done by researchers like Jin et al., [17] and Kim et al., [18] who pointed out that online social gaming is capable of providing those who play these games with intrinsic rewards in the form of satisfaction, pleasure and even arousal and it is understood that it is these intrinsic rewards that spurs the interests of users and make them become very highly focused on these video games and literally absorb them into playing online social games at a greater level. This finding was observed in the research done by Tan, [19]. In order to acquire such favourable rewards and feel a sense of pleasure over and over again, the user will most likely spend even more time when it comes to playing online social video games and this will be repeated over and over again in the future (Liu et al., [20]). In consequence of this, many researchers have come to the conclusion that the positive reinforcement learning when it comes to perceived enjoyment would have the effect of increasing the chances of a user indulging in excessive online social gaming. Social online games can offer users intrinsic benefits, such as enjoyment, fun and excitement. These intrinsic incentives make users who play online video games highly oriented and consumed. Users are likely to spend a significant amount of time playing online multiplayer games in the future in order to get such attractive rewards again. Positive reinforcement of awareness processing enjoyment will increase the probability of unhealthy social gaming online.

#### **2.2.4 Relationship between perceived escapism and excessive online social gaming**

A lot of prior research has analysed the role of perceived escapism and the way that is correlated with excessive online social gaming. The eradication of punishments for the purposes of this research can be conceptualised as perceived escapism and this makes reference to the requirement to escape from, and to cope with various problems that a person faces in their lives and this is true playing online social games. This sort of view and conceptualisation is also supported by researchers like Lee et al., [21]. Those indulging in online social gaming are observed to experience all kinds of real-life problems and these range from being stressed, being dissatisfied with their lives, being lonely, being dissatisfied with their work or even inability to cope with their studies. Researchers like Sun, Zhao, Jia and Jeng, [22] also point out such a factor in the studies they have carried out. Usually, by playing online social games, an individual is able to have temporary relief and escape their problems which they face in their lives. Usually, they would stop having to worry about these problems when they indulge in a fantasy world of gaming. Many past studies have found that the concept of perceived escapism will have a role in developing psychological dependence of a user towards adopting online games at higher frequency and this can generate a tendency of such a user to indulge in excessive online gaming. Research by Xu et al., [5] observed that the requirement for escapism is capable of generating very excessive online gaming that can reach the point of obsession. Researchers such as Lee et al., [23] had observed that escaping of negative emotions would result in an individual indulging in an excessive amount of online gaming. It is also expected that the presence of negative reinforcement learning of perceived escapism would have a role in facilitating a very high amount of online social gaming on part of an individual. Perceived escapism can grow the psychological dependency of users on online games, and eventually promote excessive online gaming. The desire for escapism is promoting repetitive and addictive online gaming by users. Escape from negative feelings leads to excessive online gaming by the consumers. Drażkowski, [24] also recognize that negative reinforcement of perceived escapism would make excessive online video gaming easier for users.

### **III. METHODOLOGY**

#### **3.1 Research instrument/measurement**

This research will be discussing the antecedents and consequences of excessive online social gaming on teenagers. So, the research instrument is a survey made on teenagers. Exactly it's an online survey that register E-mail to see the veracity of the respondents, The Survey will regroup 5 questions of the five norms and each question will go from strongly disagree to strongly agree questions. There will be 200 respondents who live in the Malaysia.

#### **3.2 Research Hypotheses**

Based on the rule of thumb, hypothesis is rejected when an independent variable that has a P-value higher than alpha value of 0.1/10% and vice versa. In this research, four hypotheses were being formulated after the preliminary analysis on the collection of survey questionnaires from the participants.

**H1:** There is a significant relationship between Social frequency and Excessive online social gaming.

**H2:** There is a significant relationship between Social Norm and Excessive online social gaming.

**H3:** There is a significant relationship between Perceived Enjoyment and Excessive online social gaming.

**H4:** There is a significant relationship between Perceived Escapism and Excessive online social gaming.

### **IV. DATA ANALYSIS**

#### **4.1 Descriptive Analysis**

Descriptive analysis of the respondents is going to be provided in this part of study. Analysis will include: age of respondents, gender, ethnicity, educational level, marital status.

**Table 4.1: Age of Respondents**

<b>Age of the Respondents</b>			
	Frequency	Percent	Valid Percent
13 – 14 years old	10	5	5
15 – 16 years old	29	14	14
17 – 18 years old	93	47	47
18 years old and above	68	34	34
Total	200	100	100

The age of respondents identified in the table 4.1. The majority of respondents 93 (47%) were in the age of 17 to 18 years old; 68 (34%) of respondents in the age 18 years old and above; 29 (14%) in the age 15 – 16 years old; hence, the minority (10: 5%) were in the age of 13 – 14 years old.

**Table 4.2: Gender of the Respondents**

<b>Gender of the Respondents</b>			
	Frequency	Percent	Valid Percent
Male	143	72	72
Female	57	28	28
Total	200	100	100

The Table 4.2 represented gender of the questionnaire respondents, where the majority (143; 72%) were male respondents and 57 (28%) were female.

**Table 4.3: Ethnicity of the Respondents**

<b>Ethnicity of the Respondents</b>			
	Frequency	Percent	Valid Percent
Malay	35	18	18
Chinese	28	14	14
Indian	7	3	3
Others	131	65	65
Total	200	100	100

According to the findings of the above Table 4.3, majority of respondents (131; 65%) identified themselves as people of other nationalities; hence, 35 (18%) of respondents were representatives of Malay group, 28 (14%) were Chinese and only 7 (3%) were Indian.

## 4.2 Reliability Analysis

**Table 4.4: Reliability Analysis Results**

Variables	Cronbach's Alpha	No of Items
Excessive Online Social Gaming	0, 882	5
Social Frequency	0, 843	5
Social Norm	0, 867	5
Perceived Enjoyment	0, 897	5
Perceived Escapism	0, 895	5
Total	0, 976	25

Reliability analysis results are respresented in the table 4.4 above, the analysis was conducted based on every ariable individually, hence overall as well. The data considered to be reliable and valid for further studies when the value of Cronbach's Alpha is within the range of 0.7 to 1. Consequently, the results of this study can be considered as reliable. The Cronbach's alpha value of excessive online social gaming identified to be 0,882; social frequency equal to 0,843; social norm 0,867; perceived enjoyment identified to be 0,897; and perceived escapism equal to 0,895. The total results of all 25 items equal to 0,976.

**Table 4.5: Descriptive Statistics**

Descriptive Statistics				Statistic	Std Error
EOSG	Mean			4, 6430	0, 03112
	95% Confidence Interval for Mean				
		Lower Bound		4, 5816	
		Upper Bound		4, 7044	
	5% Trimmed Mean			4, 6756	
	Median			4, 8000	
	Variance			0, 194	
	Std.Deviation			0, 44014	
	Minimum			3, 20	
	Maximum			5, 00	
	Range			1, 80	
	Interquartile Range			0, 80	
	Skewness			-0, 977	0, 472
	Kurtosis			0, 003	0, 342

Z – Score calculation is going to be conducted in this part of study. Skewness values from Table 4.5 are going to be implemented for following formula:

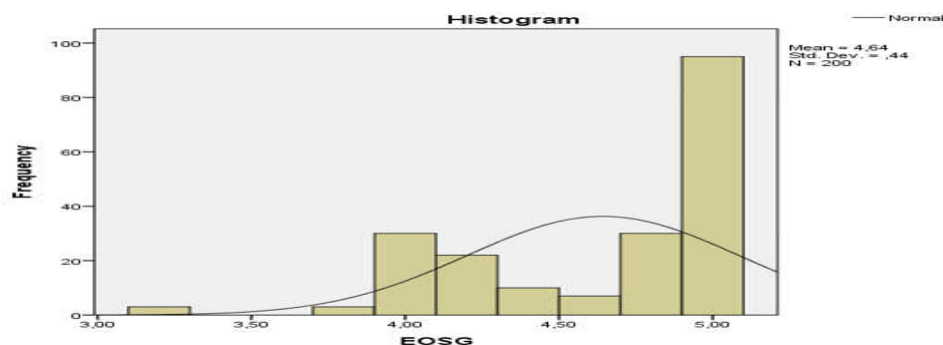
**Z-Score =**

**Statistics % Standard Error =**

**-0, 977 % 0, 472 = -2, 069**

The results of Z – Score calculation required to be within the range of  $-3.29 < Z < 3.29$  for the number of respondents of 150 and above. Therefore, the results of this study equal to -2.069, what is within required range. Consequently, the data can be analysed as normally distributed. In addition, Histogram analysis will be conducted.



**Figure 4.1: Histogram of Normality**

Bell – Shaped residuals of Histogram Figure 4.1, prove that the data was normally distributed. Therefore, applicable for further studies.

### 4.3 Multiple Regression Analysis

**Table 4.6: Analysis of Variance**

ANOVA						
Model		Sum of Square	Df	Mean Square	F	Sig.
1	Regression	38, 157	4	9, 539	4733, 793	0, 000
	Residual	0, 393	195	0, 002		
	Total	38, 550	199			
a. Dependent Variable: EOSG						
b. Predictors: (Constant), PEs, SN, SF, PE						

The ANOVA significance results represented in the table 4.6 will identify if the results of this study and data collected is proper fit for this research. The significance value of table 4.12 is required to be within the range of  $\leq 0.05$ . Therefore, the value of Significance in the table is equal to 0.000, what justified to be perfect fit of the data.

**Table 4.7: Model Summary of Multiple Regression Analysis**

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Durbin - Watson
1	0, 995	0, 990	0, 990	0, 04489	1, 705
a. Predictors: (Constant), Pes, SN, SF, PE					
b. Dependent Variable: EOSG					

The value R of table 4.7 is an effective measure of the prediction quality of the Effective Online Social Gaming (DV). The result of 0.995 display valuable level of prediction. The value R Square identify the degree level of variance in the dependent variable which is explained by independent variables. The value 0.990 of independent variables (social frequency, social norm, perceived enjoyment, perceived escapism) explain 99% of dependent variable.

## V. DISCUSSION AND CONCLUSION

The data of this study was collected from the number of 200 respondents. The demographic data analysis was conducted at the beginning of the previous chapter. It was identified that majority of the respondents were males (143; 72%) in the age of 17 – 18 years old (93; 47%); hence, the majority of people identified themselves as internationals (147; 74%) of various ethnicities (131; 65%). The education level of majority group was identified to be degree level (88; 44%).

**Table 4.8: Descriptive Statistics**

Correlation Analysis	Pearson Correlation of Excessive Online Social Gaming
	Social Frequency: 0.930
	Social Norm: 0.920
	Perceived Enjoyment: 0.991
	Perceived Escapism: 0.940
Multiple Regression Analysis	R Square: 0.990
	ANOVA (Sig. value): 0.000
	P-value of Social Frequency: 0.000
	P-value of Social Norm: 0.003
	P-value of Perceived Enjoyment: 0.000
	P-value of Perceived Escapism: 0.000

The Table 4.8 display analysis received from SPSS software, which was used to study primary data results. The values of the above table include correlation analysis and multiple regression analysis. The Pearson Correlation between Excessive Online Social Gaming and independent variables is as following: social frequency (0.930), which is very strongly correlated with DV; social norm (0.920), which also identified to be very strongly correlated with study DV; perceived enjoyment value is equal to 0.991 (very strongly correlated); and perceived escapism is equal to 0.940 (very strongly correlated) as well.

The R value of the multiple regression analysis is equal to 0.990, what display that 99% of excessive online social gaming can be explained by independent variables (social frequency, social norm, perceived enjoyment and perceived escapism). ANOVA significance value equal to 0.000, which fits within required range of  $N < 0.05$ . Therefore, all of the data is correlated and significant for the current work.

### 5.1 Social Frequency Findings

According to the findings represented in chapter four, there is direct and positive connection between social frequency and dependent variable (excessive online social gaming). The results displayed that there is very strong correlation between the DV and social frequency, what also is positive and significant. In addition, the work of Lee [13] justified that social frequency is initial part of excessive online gaming, what also support the findings of this study.

### 5.2 Social Norm

Social Norm is another independent variable with very strong correlation, positive and significant (0.003) level of impact on excessive online social gaming. Whereas, Song [25] identified that social norms of various cultures significantly impact the behaviour of online social gaming, which is vary from country to country.

### 5.3 Perceived Enjoyment

Another significant independent variable with very strong level of correlation with dependent variable is perceived enjoyment. The variable was also identified as positive. Therefore, perceived enjoyment is an important variable of this study. The level of perceived enjoyment and the variables that significantly affect it were studied by Gong [4].



### 5.4 Perceived Escapism

Independent variable of perceived escapism has direct impact and connection with excessive online social gaming. Outcomes from previous chapter displayed that there is very strong correlation between the variables. The significance value of perceived escapism was also in the range of below 0.05 and equal to 0.000. In addition, Calleja [26] supported the statement of relation between perceived escapism and excessive online social gaming.

### REFERENCES

- [1] Liu, D., Li, X. and Santhanam, R. (2013), "Digital games and beyond: what happens when players compete", *MIS Quarterly*, Vol. 37 No. 1, pp. 111-124
- [2] Kwon, H.E., So, H., Han, S.P. and Oh, W. (2016), "Excessive dependence on mobile social apps: a rational addiction perspective", *Information Systems Research*, Vol. 27 No. 4, pp. 919-939
- [3] Chen, A., Lu, Y. and Wang, B. (2016), "Enhancing perceived enjoyment in social games through social and gaming factors", *Information Technology & People*, Vol. 29 No. 1, pp. 99-119
- [4] Gong, X. (2019, sept 16). Antecedents and consequences of excessive online social gaming: a social learning perspective. Retrieved from <https://www.emerald.com/insight/content/doi/10.1108/ITP-03-2018-0138/full/html?>
- [5] Xu, Z. (2010, april 10). Online game addiction among adolescents: motivation and prevention factors. Retrieved from <https://www.tandfonline.com/doi/abs/10.1057/ejis.2011.56?Scroll=top&needAccess=true&journalCode=tjis20>
- [6] Liu, M. (2019). Cognitive and psychological predictors of the negative outcomes associated with playing MMOGs (massively multiplayer online games). Retrieved from <https://msu.edu/~pengwei/Cognitive%20and%20psychological%20predictors%20of%20the%20negative%20outcomes%20associated%20with%20playing%20MMOGs.pdf>
- [7] Cheung, C. M. (2019). College-aged users behavioral strategies to reduce envy on social networking sites: A cross-cultural investigation. Retrieved from <https://www.sciencedirect.com/article/pii/S0747563219300858?via%3Dihub>
- [8] Lee, Z.W.Y., Cheung, C.M.K. and Chan, T.K.H. (2014b), "Explaining the development of the excessive use of massively multiplayer online games: a positive-negative reinforcement perspective", paper presented at the 47th Hawaii International Conference on System Sciences, IEEE, HI
- [9] Zheng, X. and Lee, M.K.O. (2016), "Excessive use of mobile social networking sites: negative consequences on individuals", *Computers in Human Behavior*, Vol. 65, pp. 65-76
- [10] Gong, X. (2019, sept 16). Antecedents and consequences of excessive online social gaming: a social learning perspective. Retrieved from <https://www.emerald.com/insight/content/doi/10.1108/ITP-03-2018-0138/full/html?>
- [11] Griffiths, M. D. (2015). Online Games, Addiction and Overuse of. Retrieved from <https://onlinelibrary.wiley.com/doi/full/10.1002/9781118767771>
- [12] Cheung, C.M., Lee, Z.W. and Lee, M.K. (2013), "Understanding compulsive use of Facebook through the reinforcement processes", paper presented at the 21th European Conference on Information Systems, Utrecht
- [13] Lowry, P.B., Zhang, J., Wang, C. and Siponen, M. (2016), "Why do adults engage in cyberbullying on social media? An integration of online disinhibition and deindividuation effects with the social structure and social learning model", *Information Systems Research*, Vol. 27 No. 4, pp. 962-986
- [14] Lee, K. (2020). The Social Media Frequency Guide: How Often to Post to Facebook.. Retrieved from <https://buffer.com/library/social-media-frequency-guide> Lee, Z.W.Y., Cheung, C.M.K. and Chan, T.K.H. (2014b), "Explaining the development of the excessive use of massively multiplayer online games: a positive-negative reinforcement perspective", paper presented at the 47th Hawaii International Conference on System Sciences, IEEE, HI
- [15] Trepte, S. (2018). The social side of gaming: How playing online computer games creates online and offline social support. Retrieved from [https://www.researchgate.net/publication/3233489327\\_The\\_social\\_side\\_of\\_gaming\\_How\\_playing\\_online\\_computer\\_games\\_creates\\_online\\_and\\_offline\\_social\\_support](https://www.researchgate.net/publication/3233489327_The_social_side_of_gaming_How_playing_online_computer_games_creates_online_and_offline_social_support)
- [16] Kwon, H.E., So, H., Han, S.P. and Oh, W. (2016), "Excessive dependence on mobile social apps: a rational addiction perspective", *Information Systems Research*, Vol. 27 No. 4, pp. 919-939
- [17] Cheung, C.M., Lee, Z.W. and Lee, M.K. (2015), "Understanding compulsive use of Facebook through the reinforcement processes", paper presented at the 21th European Conference on Information Systems, Utrecht

- [18] Jin, W., Sun, Y., Wang, N. and Zhang, X. (2017), "Why users purchase virtual products in MMORPG? An integrative perspective of social presence and user engagement", *Internet Research*, Vol. 27 No. 2, pp. 408-427
- [19] Kim, H., Lee, D. and Hwang, J.-S. (2018), "Dividing network externality into the number of peers and users", *Information Technology & People*, Vol. 31 No. 2, pp. 388-404
- [20] Tan, W.K. (2018), "Gamification in aquarium context: intention to play game that impacts knowledge and promotes marine animal conservation", *Information Technology & People*, Vol. 31 No. 6, pp. 1070-1090
- [21] Liu, D., Li, X. and Santhanam, R. (2013), "Digital games and beyond: what happens when players compete", *MIS Quarterly*, Vol. 37 No. 1, pp. 111-124
- [22] Sun, Y., Zhao, Y., Jia, S. and Zheng, D. (2015), "Understanding the antecedents of mobile game addiction: the roles of perceived visibility, perceived enjoyment and flow", paper presented at the 19th Pacific Asia Conference on Information Systems, Singapore
- [23] Lee, Z.W., Cheung, C. and Chan, T.K. (2014a), "Understanding the development of problematic use of massively multiplayer online game", paper presented at the 35th International Conference on Information Systems, Auckland
- [24] Drażkowski, D. (2014). escapism predicts decreased Well-being: examination of gaming time. Retrieved from: [https://www.academia.edu/8006957/MMORPG\\_escapism\\_predicts\\_decreased\\_Well-being\\_examination\\_of\\_gaming\\_time\\_game\\_realism\\_beliefs\\_and\\_online\\_social\\_support\\_for\\_offline\\_problems](https://www.academia.edu/8006957/MMORPG_escapism_predicts_decreased_Well-being_examination_of_gaming_time_game_realism_beliefs_and_online_social_support_for_offline_problems)
- [25] Song, H., Schuldt, I. P., McLeod, P. I., Crain, R. I. & Dickinson, I. I. (2018). Group norm violations in an online environmental social network: Effects on impression formation and intergroup judgments. *Group Processes & Intergroup Relations*, 21(3), 422-437.
- [26] Calleja, G. (2017). Digital Games and Escapism. Retrieved from [https://www.researchgate.net/publication/240286002\\_Digital\\_Games\\_and\\_Escapism](https://www.researchgate.net/publication/240286002_Digital_Games_and_Escapism)