



How to cite this article:

Wan Yaacob, W. M. Y., Zakaria, N. H., & Mat Aji, Z. (2021). Identification of factors contributing to the online game addiction among adolescents. *Journal of Information and Communication Technology*, 20(4), 565-597. <https://doi.org/10.32890/jict2021.20.4.5>

Identification of Factors Contributing to Online Game Addiction among Adolescents

¹Wan Mohd Yusoff Wan Yaacob, ²Nur Haryani Zakaria &
²Zahurin Mat Aji

¹Department of Information Technology & Communication,
Politeknik Sultan Abdul Halim Mu'adzam Shah, Malaysia

²School of Computing, Universiti Utara Malaysia, Malaysia

yusoff@polimas.edu.my
haryani, zahurin @uum.edu.my

Received: 31/10/2020 Revised: 27/1/2021 Accepted: 15/3/2021 Published:27/9/2021

ABSTRACT

Nowadays, there are growing views of potentially addictive behaviors such as digital addiction, especially Online Game Addiction (OGA). This study argues that all types of addictions are related to common components, such as salience, mood modification, tolerance, withdrawal, conflict, relapse, and problems. Despite the plethora of online game consequences, there is no standard or benchmark used to classify between addicted and non-addicted users. Therefore, this study is organized to identify the factors that contribute to OGA and examine the level of OGA especially among adolescents by utilizing the Online Game Addiction Scale (OGAS). Using the same scale, the adolescents were classified into addicted and non-addicted categories. Driven by previous studies of conventional game addiction, this

study adopted all the distinct common components to measure seven underlying criteria related to OGA. The dimensional structure of the scale was analyzed based on the samples of adolescents among students of higher learning institutions (HLI) in Northern Malaysia. Data were collected from 389 participants who responded to an online survey. Based on OGAS, 35 percent of the participants were found to be addicted to online games. In addition, the findings demonstrated good concurrent validity as shown by the coherent associations between the time spent on playing games and the category of the games. This study contributes to the identification of factors that influence OGA among adolescents, which are significant in preventing the occurrence of other behavioral issues such as insecure cyber and emotional behaviors.

Keywords: Addictive behavior, digital addiction, online game addiction, online game disorder, scale, adolescent.

INTRODUCTION

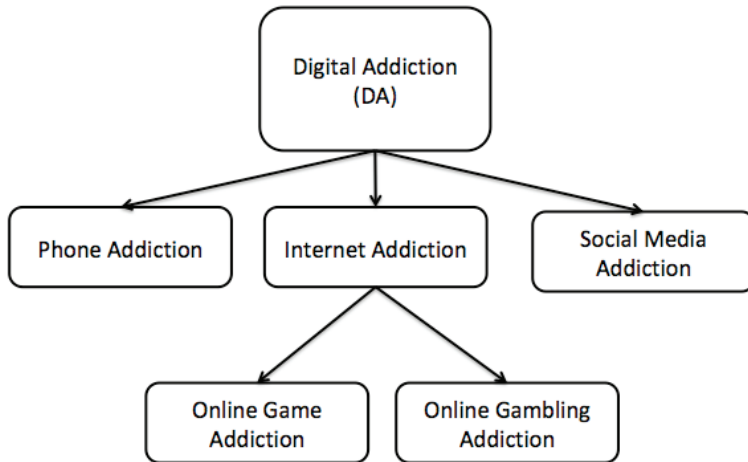
Behavioral addiction is classified as one of the psychosocial facets of playing computer and digital games that is most frequently discussed nowadays. Historically, behavioral addiction can be described as any behavior that involves the main factors of addiction (Griffiths, 2005). In the world of psychology, the weakening of common sense is referred as bravery driven by societal ideals and also induced by impulsiveness and cybercognition (Bolton et al., 2013). Three addiction levels that apply to beginner, intermediate, and advanced (Ng & Wiemer, 2005) represent the basic degree of self-control and distinct conduct. Griffiths (2009) also reported that addictive behavior would influence cognitive abilities in decision-making, which lead to the biopsychosocial paradigm of component addiction including digital addiction (DA).

According to the literature, many attempts have been carried out to categorize DA based on several classes or types. For example, as shown in Figure 1, the researchers (Idubor, 2015; Alrobai, 2016; Cover, 2016; Park & Lim, 2018) classified DA into three types; (i) Phone Addiction; (ii) Internet Addiction; and (iii) Social Media Addiction. By focusing on Internet Addiction, Hadlington and

Parsons (2017) together with Novrialdy and Atyarizal (2019) then divided it into two categories: (i) Online Game Addiction; and (ii) Online Gambling Addiction. The present study concentrates on the extent and categorization of addiction level among adolescents that are linked to Online Game Addiction (OGA).

Figure 1

Types of Digital Addiction



Based on Xu et al. (2012), online game addiction refers to the gaming disorder related to the problematic, repetitive, and compulsive use of online game platforms, which contributes to a severe inability over a prolonged period of time to work in various realms. This term becomes the topic of research and discussion among experts in different disciplines within the medical, scientific, and gaming communities. According to Balakrishnan and Griffiths (2018), this addiction could be triggered based on individual involvement in online gaming activities with fulfilling higher obligation or other desires regardless of the negative effects.

According to the statistic report produced by Spil Games (2019), 1.2 billion people played games worldwide including 700 million of them who were associated with online gaming. This is equivalent to 17 percent of the world population, in which every category of players are included. The research also revealed that the demographic

group of 15–24 years old is the highest age range with approximately 45 percent of the figures referring to adolescents. The escalation of this online gaming habit in people's daily routine has contributed to OGA among adolescents (Kuss & Griffiths, 2012). In placing more emphasis on this topic, the same issues were also highlighted by Bekir and Çelik (2019), whereby adolescents represent the most individuals in a community who have been reported to be online game addicts on a daily basis. The addiction occurred because online games are usually filled and supported with special features and elements, such as understanding of flow, unique simulation, versatility, competition, and interesting plot or storyline (Meschtscherjakov et al., 2016). Regarding this issue, there is a need to identify the factors that contribute to OGA and recognize the group of adolescents involved in OGA. The aim of this study is to identify the factors that contribute to OGA and examine the level of OGA among adolescents. The adolescents are classified into addicted and non-addicted groups. Thus, it is hypothesized that the factors in OGA are in line with the result from Lemmens et al. (2009), which indicated that salience is the dominant factor followed by tolerance, mood modification, withdrawal, relapse, conflict, and problems. This paper starts by reviewing previous related studies, followed by presenting the methodology, results, and findings. Then, it is extended to the discussion section before concluding with potential future research.

RELATED STUDIES

OGA among Adolescents

The World Health Organization (WHO) has defined adolescent as a person aged between 10 to 19 years old (Bekir & Çelik, 2019). Having a similar view on the adolescent's age range, Alrobai et al. (2014) developed a convincing instrument to mitigate OGA with the use of online peer groups as one of the remedies to alleviate these issues by putting more focus on students' success and outcomes. Moreover, Kesici and Fidan (2018) reiterated on the academic performance among university students by stating that the OGA epidemic is becoming a critical problem that can cause detrimental implications for the next generation. The effects of OGA among college students discovered by Baturay and Toker (2019) were found to be compatible

to the findings of addictive online games recorded by Lemmens and Hendriks (2016) that concentrated on the relationship between genres and gaming disorder. Through their research to explore the variables of OGA among teenagers, Bekir and Çelik (2019) claimed that they had the greater propensity to pursue incentives and take risks to engage in OGA. The results were derived from a survey conducted among high school students and data gathered on these three scales: video game addiction rate, sensational quest, and specific psychological needs. This study also explored on the constructive and necessary interaction between simple psychological requirements toward online games. With regard to this problem, Dilci (2019) came up with a diagnostic scale for OGA but only focused on the effect of digital dependence and the research on the efficacy and reliability of the scale by using impulsivity of scarcity and mitigating results, social isolation, and low self-perception. Despite the plethora of gaming scale and measurement, there is no specified standard to classify between addicted and non-addicted users among adolescents toward OGA. This is very important to identify the focus group in executing a mitigation plan regarding this issue.

OGA and Academic Performance

In particular view of OGA and the relationship with academic performance, Durak (2019) reported that OGA could give negative effects among high school students. The related study based on the performance of OGA affecting students and adolescents also confirmed the problems of academic achievement caused by DA (Baturay & Toker, 2019). Jameel et al. (2019) underlined six addiction domains (i.e., salience, mood modification, tolerance, withdrawal, conflict, and relapse) as previously mentioned that influenced the performance of students on the addiction model vector. Bekir and Çelik (2019) verified this finding and also determined the factors that contributed toward OGA among adolescents. An analysis by Alrobai et al. (2016) recommended an online peer assessment as a compelling means for minimizing OGA among adolescents. At the same time, there are also several prominent authors in the field of OGA that focused on academic performance among students. For instance, Altun and Atasoy (2018) conducted a meta-analysis and preliminary analysis to study the effect of video game reliance on primary school students. In the meantime, Jia et al. (2017) published a related research that indicated

an appropriate approach for shifting video game addiction among graduate students into the interest of school learning, while Lemmens and Hendriks (2016) noticed in their research the association between OGA and gaming disorder in relation to OGA, which was supported by Anderson et al. (2017) and Karademir et al. (2019). From these results, it can be concluded that OGA has significantly become a problem in academic achievement among adolescents and plays an important role in changing an individual's behavior.

OGA in Cybersecurity Perspective

Cybersecurity behavior refers to the human behavior while performing various activities in the cyber world. The three human characteristics that influence the cybersecurity behavior of addicted gamers include cybercognition, impulsivity, and awareness (Hadlington, 2017). Cybercognition refers to a method to describe cognitive response and activities of humans that are conducted in cyberspace (Internet) through digital platforms, such as smartphones, computers or tablet devices (Blackwell et al., 2017; Aivazpour & Srinivasan, 2018). Impulsivity is the tendency of an individual in reflecting unconscious or spontaneous actions and consequences (Aivazpour & Srinivasan, 2018; Hadlington, 2018). On the other hand, having awareness through a formal training or education process on related matters can produce significant results to the cybersecurity behavior (Arachchilage et al., 2016; de Bruijn & Janssen, 2017). The findings from Durak (2019) and Hadlington (2017) have also acknowledged several relationships between human factor variables and the viewpoint of cybersecurity. According to Arachchilage and Love (2013), online games nowadays are vulnerable to security risks like phishing and social engineering and the situation becomes worse when the games stimulate and are linked to OGA.

METHODOLOGY

This study implemented the quantitative research approach by conducting an online survey using OGAS as its main instrument (Başol & Kaya, 2018). A further subsection below addresses the specifics of OGAS. In general, this research began with the preparation of OGAS, which was then circulated through Google Form to participants during

a scheduled session on an online forum. The gathering of details was carried out in around one and a half months, involving randomly invited adolescents through email and poster announcements. Until the compilation of details was completed, the answers collected were reviewed accordingly. According to the detail of methodology-related components regarding this study, the online survey was performed successfully, which was conducted in January 2020, involving 389 students from five separate higher learning institutions situated in the northern area of Malaysia covering states like Kedah, Perlis, Penang, and Perak. The participants were randomly chosen from the Department of Information and Communication Technology. By focusing on stratified sampling, probability sampling technique was chosen to collect the data and enrich the outcome. The community was split into more than one category and subsamples were randomly collected from each stratum. In this way, the survey became more accurate as it was represented by subgroups. This online survey was conducted in a planned session to the participants during academic hours. If no Internet link was available during the survey session, an alternate paper-and-pencil survey was also planned. In order to improve the privacy aspect with regard to their given responses, participants were informed that their statements would remain confidential and would only be reviewed by researchers for research purposes. If the participants had not played computer games at all, they were exempted from this survey. Almost 94 percent of participants in the first sample had familiarity of computer games. The overall total of participants who took part in this online survey was 396 participants.

OGAS

OGAS was adopted from Lemmens et al. (2009), which was used to measure and determine the level of OGA. This adopted scale was introduced with a prominent framework in measuring addiction pertaining to the psychology domain. The difference between OGAS and Lemmens' original scale is related to the game platform, whereby the Lemmens' scale focuses on the conventional game, while OGAS emphasizes online games, which is in line with the context of this study. The seven components included in the instrument are summarized in Table 1.

Table 1

OGA

Components	Description	Reference
Salience	Playing online games has been the key event in the life of an individual and has an impact on the way people think, act, and respond.	
Mood Modification	The experiences acquired by individuals through games are characterized as calming and restful feelings synonymous with escapism.	
Tolerance	The mechanism in which people start playing games more often and increasingly invest time playing games.	Griffiths (2000)
Withdrawal	When the game is abruptly reduced or discontinued, intense moodiness and irritability such as trembling, and troubling emotional effects arise.	Lemmens et al. (2009)
Conflict	Interpersonal disagreements stemming from unrealistic sports, such as participant disputes, can involve claims, negligence, lies, and anger.	
Relapse	The inclination to stick to past playing habits again and again. Excessive habits of play are readily resumed following cycles of abstinence or regulation.	
Problems	The ramifications of repetitive play causing displacement difficulties as the subject of behaviors involving addiction.	

The online survey consisted of scores varying from 1 to 7 by following certain scales to show their degree of addiction based on seven related

components. Participants were asked to use the 5-point rating system to address the questions: (1) Never; (2) Seldom; (3) Sometimes; (4) Often; and (5) Always. Comrey (1988) stated that 5-point rating scales offer adequate feedback and responses. Scores 1 to 3 will classify the users into the non-addicted group, and if the score is 4 and above, the participants will be classified as addicted to online games on the basis of the study as mentioned in Table 2. This equation was based on the conventional addiction scale in Psytoolkit, which is the same as the polythetic format (Mental Illness Evaluation and Statistical Manual (DSM)) for addicted gambling as updated by Stoit (2017).

Table 2

The Score Rating in Group Classification (Lemmens, 2009)

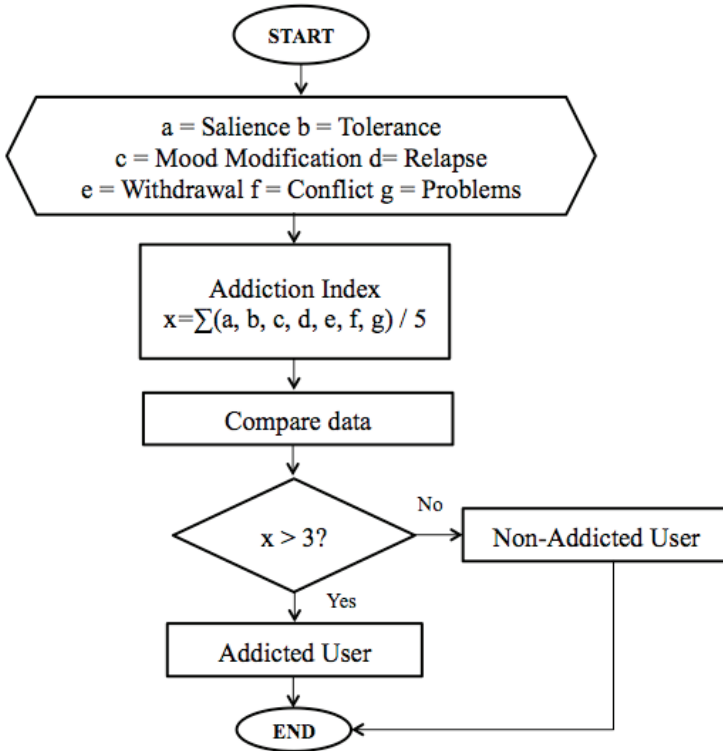
Score	Description
7	Addicted
6	Addicted
5	Addicted
4	Addicted
3	Non-addicted
2	Non-addicted
1	Non-addicted

The Measurement Level of OGA

The level of OGA was measured with a related algorithm in order to evaluate the responses given by calculating the degree of OGA and categorizing the participants into addicted and non-addicted users. Figure 2 outlines this algorithm briefly.

Figure 2

Algorithm Used to Calculate Addiction Index



This algorithm started with the calculation of the addiction index, which was used to compare the recorded score from the online survey participants. Upon completion of this phase, two types of clusters for addicted and non-addicted users would be recognized. Other data on online gaming activities as well as seven components in OGAS were also accessible, which were thought to strengthen efficiency and correlate between the levels of OGA and other characteristics. The descriptions of the related online game characteristics are shown in Table 3.

Table 3

Online Game Characteristics

Characteristic	Description
Gaming Platform	Via this portion, which consists of numerous platforms such as mobile phones, tabs, personal computers, game consoles, and arcades, the preferred gaming platform has been registered.
Category of Games	The category of video games selected by participants, such as massively multiplayer online (MMO), role playing games (RPG), sports, strategy, and simulation will be discussed in this section. The outcome would also contribute to the name of the matches that correspond to the type of matches being played.
Time Consumption on Online Games	The overall length and utilization of online games is determined by the amount of hours per day spent on these activities in measuring the days of the week.

RESULTS AND FINDINGS

This section presents the results and findings of this study that is divided into three main sections, namely (i) demographic details; (ii) categorization of OGA; and (iii) factors contributing to OGA.

Demographic Details

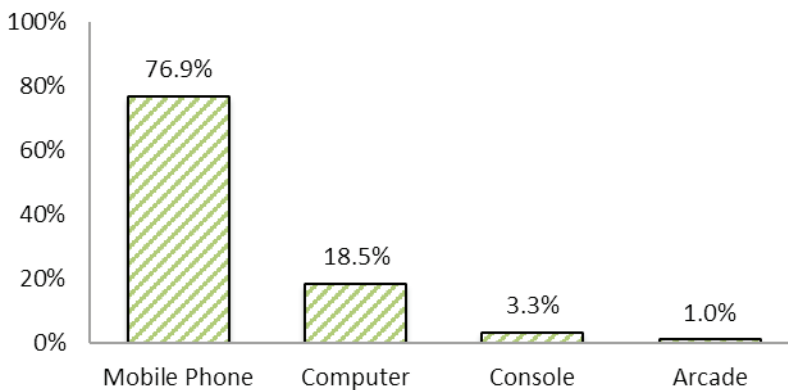
The participants involved in this study came from several higher learning institutions (HLI) in the northern part of Malaysia. Those participating institutions were HLI_1, HLI_2, HLI_3, and HLI_4. Out of these four HLIs that participated in the survey, the responses were recorded as follows: HLI_1 (47.1%), HLI_2 (12.7%), HLI_3 (17.8%), and HLI_4 (22.4%). The numbers of distribution between male and female participants were almost equivalent with the percentage of 51.1 percent and 48.9 percent, respectively. All participants represented the late adolescent category since they were between 17

and 19 years old. Specifically, 60.8 percent of them were from the group of 17–18 years old, 36.1 percent were between 18–19, and the rest were 19 and above. A majority of the adolescents (29.0%) were in the second semester of their studies, followed by those in fourth (20.1%), first (18.1%), fifth (12.7%), third (10.2%), and sixth (9.9%) semesters. Almost all students (96.7%) were from the Diploma in Digital Technology (DDT) program, whilst only 3.3 percent were from Diploma in Network Security (DNS). Likewise, most students (96.7%) had experience with playing online games. The other 3.3 percent of students, especially the females, had never played games in a mobile environment. Moreover, from the observation, most of the participants were found to be very interested in online game platforms and had been using the Internet since they were in high school.

In the gaming platform perspective, most of the participants (76.9%) chose a mobile phone as a preferable gaming device because it is multi-purpose and quick to manage rather than other platforms, such as computer, console, and arcade, which are likely to be more complex to use and carry around. Figure 3 depicts the statistics of gaming platforms chosen by the participants.

Figure 3

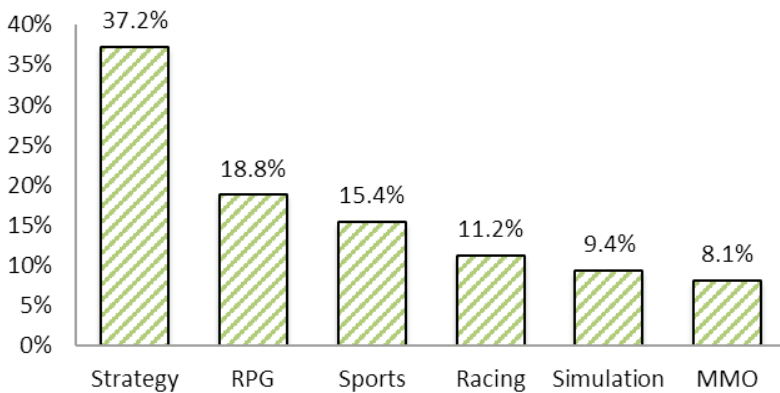
Gaming Platform



Pertaining to the category and name of the games, most of the participants chose strategy (37.2%) as the preferable genre due to expertise and freshly acquired knowledge learned from current video gamers. However, other games such as RPG (37.2%) and MMO (18.8%) could be deemed as challenging by the participants since these types also required tactics to win the games. Figure 4 shows the chart of game categories among the participants.

Figure 4

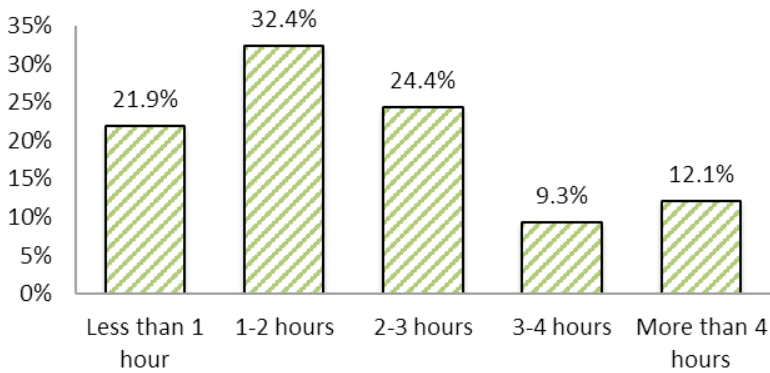
Category of Games



As stated earlier, the other online game behaviors measured in the study consisted of the gaming platform and category, time consumption on playing online games, and name of the games. From the survey, it was found that most of the students were moderate and mid-range in spending time on online games (32.4%). However, the addicted users spent more than four hours per day as depicted in Figure 5.

Figure 5

Time Consumption on Online Games



Categorization of OGA

The score and category of OGA are indicated in Table 4 based on the algorithm mentioned in the previous section. It can be clearly seen that 135 out of 389 participants were classified as addictive users instead of 254 participants who received a score below 4, showing that only 35 percent of the samples were addicted to online games.

Table 4

Score and Category of OGA

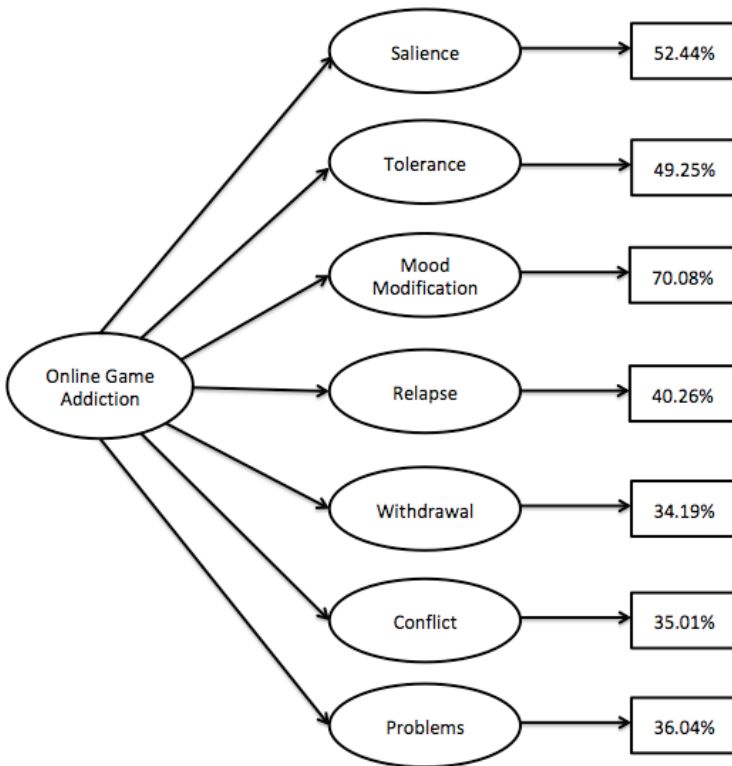
Score	User	Category
7	3	(135) Addicted
6	12	
5	27	
4	93	
3	133	(254) Non-Addicted
2	109	
1	12	

Factors Contributing to OGA

Figure 6 lists the identified factors that contribute to OGA related to the seven items from the survey. From the list, cumulatively it can be seen that the most chosen factor was mood modification, followed by salience, tolerance, relapse, problems, conflict, and withdrawal. The selections indicated that the participants had a high inclination toward OGA triggered by the expression of escapism behavior and trying to forget about their real-life existence.

Figure 6

Factors Contributing to OGAS



Mood modification is usually stimulated through various conducts of activities for achieving new changes in one's emotion. For example, a user chooses to engage in online games for the sake of seeking

happiness or excitement from being lonely or distress. By playing online games, the user can forget about their real-life problems. In this study, mood modification was selected by most of the participants (70.08%) as indicated in Figure 6.

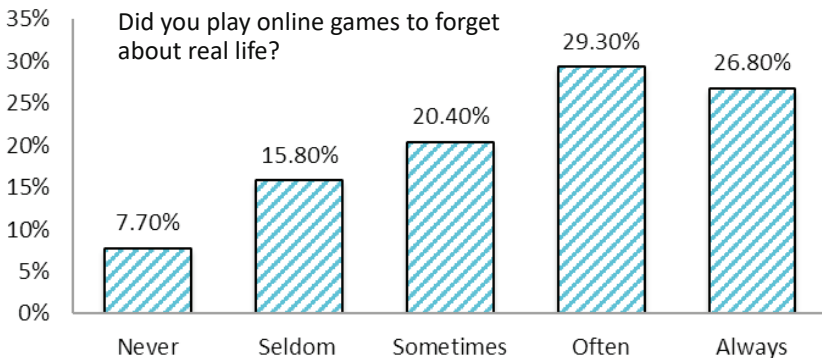
The following subsections will present sequentially each factor in its own perspective regarding OGA.

Mood Modification

This component relates to the subjective experience recorded by individuals as a result of participating in online gaming activities such as the distressing feeling of ‘escape’. The participants in the survey session were asked on questions relating to playing online games, for instance to alleviate tension, forget about real-life issues, and feel happier after playing online games. This component in the analysis became the most preferable factor that led to OGA. The ‘mood modification’ component and the sample of question are shown in Figure 7. It can be observed that the participants inclined to mark the high score regarding this factor. As a means of distressing and relaxing, the time spent on online gaming has been raised from time to time due to this aspect. In order to alleviate anxiety and forget all the difficulties in real life, the diversion aspect that relates to this component has induced the participants to play online games continuously.

Figure 7

Result for Mood Modification Factor

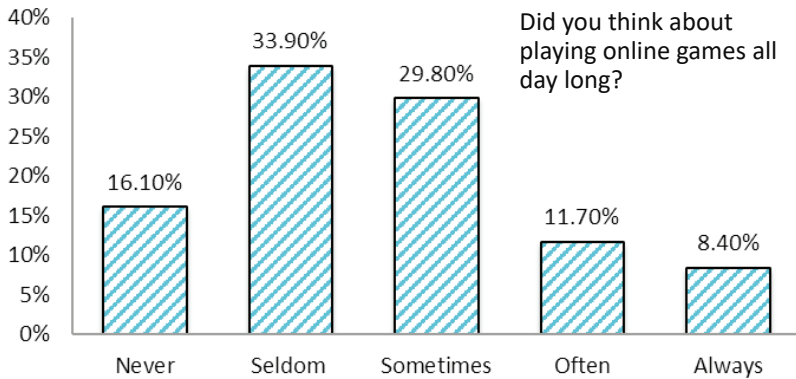


Saliency

Saliency refers to an online gamer's views in terms of concerns and cognitive distortions, feelings like craving, as well as the behavior that relates to deterioration of socialized behavior. This factor is significant since online game interactions become the most critical activity in the player's life. For example, while the person is not currently engaging in online gaming activities, they will keep on remembering and thinking about the next time that they can continue playing various online games. In this section, the participants were asked with the related questionnaire regarding playing online games during the day and continuously spending more spare time on this activity. Figure 8 presents the results of the 'saliency' factor with the sample of question that illustrate the moderate answers from the participants.

Figure 8

Result for Saliency Factor



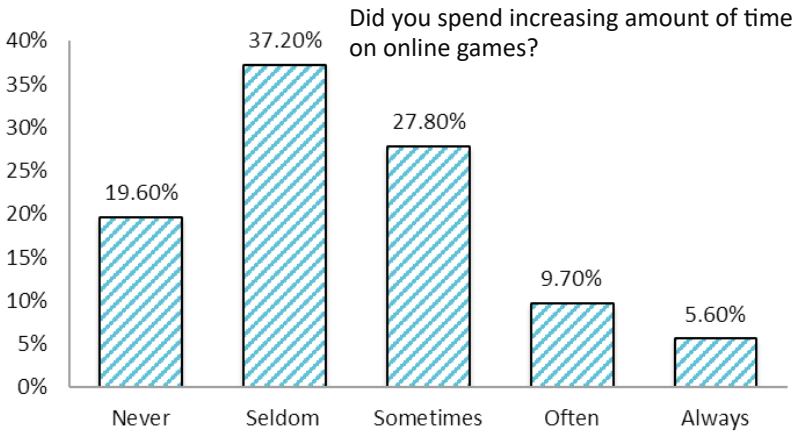
Tolerance

This factor represents the process that is related to the increment amount of time spent on playing online games. The classic example of this component is the desire to maximize the size of doses for a drug addict to get the sensation once they experience from much smaller doses. This is similar to the case of OGA in which players ought to increase the time consumption to feel a mood-modifying outcome that is initially obtained by the increment of time regarding online

games. As listed in Figure 9, the question included the intention to increase the amount of time on online games and 5.6 percent of the participant always intended to play longer. The figure also showed the average answers of the ‘tolerance’ component. From the findings, the third favored factor is assumed as an important role in OGA.

Figure 9

Result for Tolerance Factor

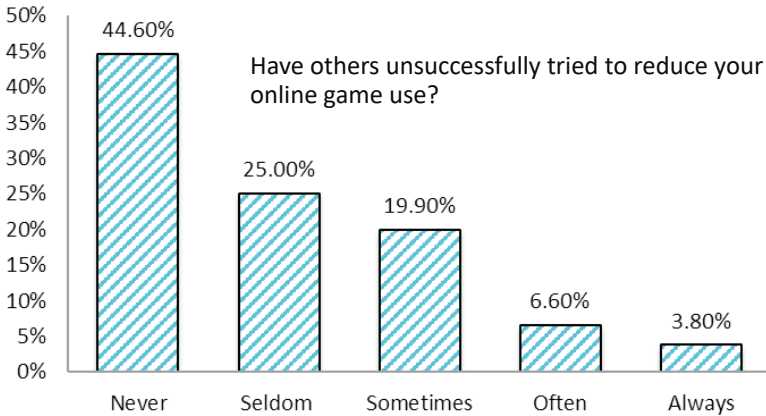


Relapse

Relapse points to the propensity of repeated versions of earlier behaviors in online gaming regarding the related activities conducted. The excessive playing pattern becomes the most extreme trend typical of the height of addiction, and after many years of abstinence or control, it may be readily revived. Two questions were asked regarding this factor: the trial of reducing the use of online games and the capability to monitor the game time. The relapse factor and the sample of question are shown in Figure 10. Only 3.8 percent of the participants failed to reduce the time in playing online games, whilst most participants choose ‘Never’. This implied that the participants could monitor the time spent on online games and rationally accept and manipulate the benefit from the use of the game.

Figure 10

Result for Relapse Factor

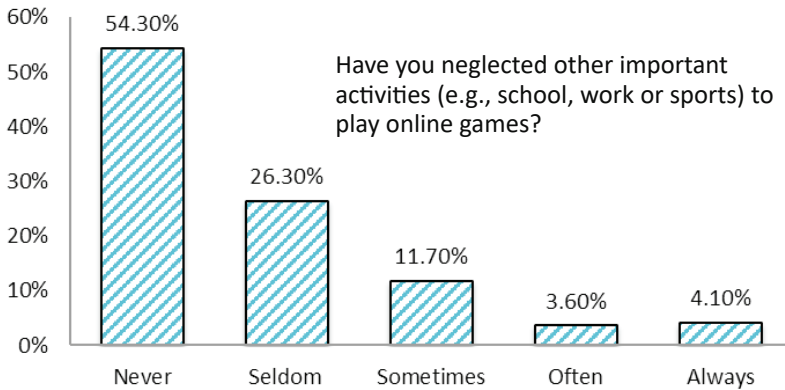


Problems

Problems portray the issues that are contributed by excessive playing of online game play. As the object of OGA takes priority over everyday tasks such as education, job, and socialization, it may primarily concern some displacement issues. Problems such as intrapsychic dispute and subjective feelings of loss of control can often occur within the person. In this section, issues like sleep deficiency, neglect of significant tasks, and feeling after playing online games for a long period were briefly discussed and asked. The related survey question and the feedbacks from the participants are recorded in Figure 11. The results indicated that most of the participants were able to minimize the issues that happened while they were participating with online gaming activities. They were also inclined to handle the emotional aspects even throughout the online gaming session to prevent the feeling of losing control.

Figure 11

Result for Problems Factor

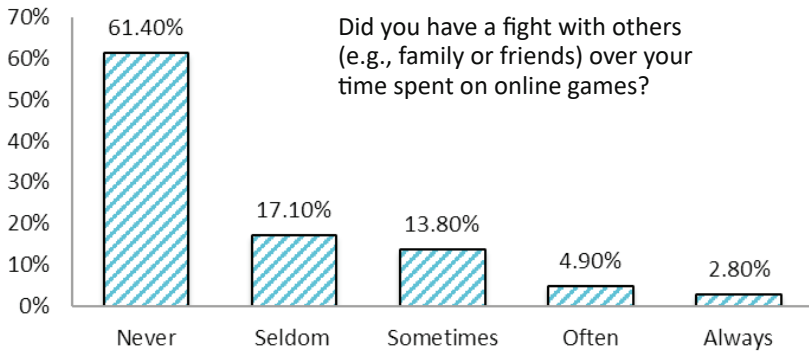


Conflict

Conflict denotes the disagreement between an addicted user and third parties around them. This is classified as an interpersonal conflict, which is also known as intrapsychic conflict. This unique behavior correlates and concerns with online gaming activities. Participants were questioned about the topic of contact with family and friends regarding the time spent on gaming, neglecting others while playing, and lying patterns of online gaming activities. Figure 12 reveals the feedback from the participants regarding the ‘conflict’ component. From this statistic, only 2.8 percent of the participants had a serious issue, whilst most participants had good communication and did not impair the interaction with family and friends regarding time consumption when playing online games.

Figure 12

Result for Conflict Factor

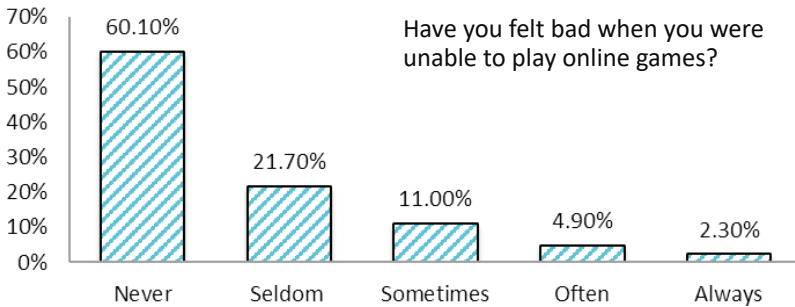


Withdrawal

Withdrawal applies to the uncomfortable feeling or physical state that arises when the operation of online gaming is stopped or abruptly decreased. This element has often developed psychological symptoms, such as intense moodiness and irritability or more physical effects such as sweats, headaches, and insomnia, same as mood modification effects. In this section, the question referred to the feeling of not being able to play video games such as anger and stress. Withdrawal effects are well recorded in drug addiction (Oxford, 2001) and it is evidenced that behavioral addictions such as pathological gambling and OGA also feature the withdrawal symptoms (Griffiths, 2004). All the feedbacks from participants are recorded as shown in Figure 13. Most of the participants preferred to select ‘Never’ when questioned about feeling terrible if they were unable to play online games, which meant that most participants would accommodate their desires and emotions in order to regulate themselves while playing online games.

Figure 13

Result for Withdrawal Factor



DISCUSSION

OGAS consisted of seven items that were mapped uniquely into seven components of addiction. It was primarily aimed at examining the level of addiction to online games among adolescents and categorizing them into addicted and non-addicted users. Based on the review of 25 related studies in this field, this study chose the most widely used term and method for assessing OGA based on the pathological gambling criteria, which are well defined in the DSM-IV classification system. Previous studies by other researchers (Griffiths, 2005; Lemmens et al., 2009) also utilized the related game addiction scales in the construct of game addiction. Despite the availability of such scales, the scope of OGA among adolescents has never been tested empirically in the online game environment, especially in mobile platforms. The common factors of OGA have been discussed firmly and the tendency for those to be significant in the context of adolescent is very likely. Nevertheless, this needs to be empirically evaluated to confirm the findings. The results from the survey revealed the dominant factors that contributed to OGA, which were not reported by previous scholars in the related studies. There seems to be some contradicting views, whereby the results showed that mood modification was the most dominant factor in OGA instead of salience as reported by Lemmens et al. (2009) in their behavioral addiction studies. This result was captured due to the response of participants toward the distressing feeling and expression of escapism behavior in order to sustain the daily mood in good condition and excitement in

playing online games. The correlations between the factors and online game behaviors, such as time consumption on online games, gaming platform as well as games category and genre, indicated negative impacts and detrimental effects among participants. The findings also supported the work of Ali et al. (2015), whereby those factors were found to be similar with other traditional addictions, such as tobacco, drug, and alcohol, together with psychological effects like anxiety, depression, and loneliness (Peper & Harvey, 2018), but in an adaptive manner suitable to the context of OGA. Finally, this study recommends that in an effort toward mitigating OGA among adolescents, both researchers and practitioners could use this scale for various benefits and outcomes.

CONCLUSION AND FUTURE RESEARCH

Since online gaming and other immersive technologies have become an integral part of everyday life among adolescents, it is important to consider and discern the aspects in which their growth is linked to inappropriate use. This study has shown that the OGAS 7-component version has a good theory-based method to empirically quantify OGA among adolescents. Since this work directly tapped the behavioral addiction among adolescents linked to OGA, potential studies could explore whether any of the results might be tailored to the interactions of other age groups such as small children or adults by concentrating on the subject group's developmental stage. It is hoped that the OGAS scale can be applied to the general assessment of game addiction and offer a clearer explanation of relevant psychosocial features. As far as issues are concerned, this study is restricted as it was conducted among late adolescents who were generally are HLI students, in particular from the field of information technology, which is considered under technical and vocational education and training (TVET). In order to achieve various kinds of outcomes, the validity and reliability analysis should be performed with other categories of adolescents at different ages.

While the reliability and content validity of this study was established, there is still much work to be done. The present researchers are very concerned with OGA in terms of protection in the cybersecurity perspective as it has become a significant issue for adolescents

when they are theoretically vulnerable to network threats, such as social engineering, phishing, spamming and others. However, the problem of online gaming addiction with respect to cybersecurity has been discussed in a very small manner. Moreover, since there is a lack of behavioral experiments that specifically concentrate on addiction behaviors in the cybersecurity perspective, the issue gets complicated and has been addressed very limitedly among the researchers. Therefore, to explain the relationship between OGA in the cybersecurity context, there is a critical need for future research to disentangle this issue. In the future, the present researchers expect to conduct a research to examine OGA in the cybersecurity perspective and contribute a related research model in order to explain the relationship between the domains. One of the ultimate goals is to be able to adopt a secure intention behavior model to infer a user's computer security attitudes and behaviors so that adequate mitigations can be tailored to their needs and abilities based on observations of other behavioral intentions. The researchers plan to conduct a survey to examine the correlation between the components of the model with cybersecurity behaviors and analyze the factors using Structural Equation Model (SEM).

ACKNOWLEDGMENT

This research was supported by the Ministry of Higher Education (MoHE) through the Fundamental Research Grant Scheme (Ref: FRGS/1/2020/ICT03/UUM/02/1). The content of this article is solely the responsibility of the authors and does not necessarily represent the official views of MoHE, Malaysia.

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**APPENDIX A: ONLINE GAME ADDICTION SCALE
(OGAS)
SECTION A: PERSONAL INFORMATION**

1.	Gender	<input type="checkbox"/> Male			<input type="checkbox"/> Female	
2.	Age	<input type="checkbox"/> 17-18	<input type="checkbox"/> 18-19		<input type="checkbox"/> 19 above	
3.	Race	<input type="checkbox"/> Malay	<input type="checkbox"/> Chinese		<input type="checkbox"/> Indian	<input type="checkbox"/> Others
4.	Higher Learning Institutions (HLI)	<input type="checkbox"/> 1	<input type="checkbox"/> 2		<input type="checkbox"/> 3	<input type="checkbox"/> 4
5.	Program	<input type="checkbox"/> DDT	<input type="checkbox"/> DNS	<input type="checkbox"/> DIN	<input type="checkbox"/> DIP	<input type="checkbox"/> DIT
6.	Semester	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
7.	Matric no. and class	_____				

SECTION B: ONLINE GAMES INFORMATION

1.	Have you ever played online games? (If “Yes”, please go to the next question. If “No”, this survey ends here)	<input type="checkbox"/> Yes			<input type="checkbox"/> No	
2.	Time spent on playing online games every day	<input type="checkbox"/> Less than 1 hour	<input type="checkbox"/> 1-2 hours	<input type="checkbox"/> 2-3 hours	<input type="checkbox"/> 3-4 hours	<input type="checkbox"/> 4 hours above

(continued)

3.	The most preferable online gaming platform	<input type="checkbox"/> Mobile Phone	<input type="checkbox"/> Tab	<input type="checkbox"/> Computer	<input type="checkbox"/> Console	<input type="checkbox"/> Arcade
4.	The most preferable online gaming category	<input type="checkbox"/> Sports	<input type="checkbox"/> Adventure	<input type="checkbox"/> RPG	<input type="checkbox"/> MMO	<input type="checkbox"/> Racing
		<input type="checkbox"/> Simulation	<input type="checkbox"/> Fantasy	<input type="checkbox"/> Survival	<input type="checkbox"/> MMO Strategy	<input type="checkbox"/> Horror
5.	Name the online game that you are most interested in	_____				

SECTION C: ONLINE GAME ADDICTION SCALE (OGAS)

No	Survey Question	Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Always (5)
1.	Do you feel like wanting to play online games all day?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Is the time spent over playing online games increasing from time to time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(continued)

No	Survey Question	Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Always (5)
3.	Do you play these online games in order to relief stress and forget the daily problems that you face?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Are you having trouble reducing the time playing online games?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Do you feel very depressed when you cannot play online games?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(continued)

No	Survey Question	Never (1)	Seldom (2)	Sometimes (3)	Often (4)	Always (5)
6.	Do you have conflicts with friends and family members regarding the time spent on online games?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Do you neglect other activities or homework because of online games?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Total Score					