

# The Influence of Game Addiction and Internet Addiction among University Students on Depression Stress and Anxiety Mediated by Self-regulation and Social Support

ผลกระทบของการติดเกมและการติดอินเทอร์เน็ตที่มีต่อภาวะซึมเศร้า ความวิตกกังวล และความเครียดของนักศึกษาที่มีระดับการควบคุมตัวเองและการสนับสนุนทางสังคมที่แตกต่าง

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## Abstract

The present study investigated the direct and indirect influences of Internet and online game addiction on the levels of depression, anxiety, and stress mediated by self-regulation and social support among students of a private university in Thailand. The study's sample consisted of 380 students of whom (218 females and 162 males) from a private university. Results from the path analysis indicated that the respondents' level of game addiction and internet addiction had both direct and indirect influences on their levels of depression, anxiety, and stress. The findings were discussed in relation to the significance of self-regulation among university students and the level of social support provided by the University.

**Keywords:** Internet addiction, Game addiction, Self regulation, Social support

## บทคัดย่อ

งานวิจัยครั้งนี้เป็นศึกษาผลกระทบทั้งโดยตรงและโดยอ้อมของการติดเกมและติดอินเทอร์เน็ตต่อภาวะซึมเศร้า ความวิตกกังวล และความเครียด โดยมีปัจจัยเกี่ยวกับการควบคุมตัวเองและการสนับสนุนของสังคมมาเป็นตัวกลาง โดยศึกษาจากนักศึกษามหาวิทยาลัยเอกชนแห่งหนึ่ง จำนวน 380 คน ซึ่งเป็นชาย 162 คนและหญิง 218 คน ผลการวิเคราะห์ข้อมูลพบว่าระดับของการติดเกม และการติดอินเทอร์เน็ตมีผลกระทบทั้งทางตรงและทางอ้อมอย่างมีนัยสำคัญต่อระดับความซึมเศร้า ความวิตกกังวล และความเครียด ผลการวิจัยยังแสดงให้เห็นว่า การควบคุมตัวเอง และการสนับสนุนจากสังคมเป็นปัจจัยที่ส่งผลอย่างมีนัยสำคัญต่อผลกระทบของการติดเกมและติดอินเทอร์เน็ตต่อปัจจัยทางจิตวิทยาข้างต้น

**คำสำคัญ:** การติดอินเทอร์เน็ต การติดเกม การควบคุมตัวเอง การสนับสนุนทางสังคม

วารสารวิชาการบริหารธุรกิจ

สมาคมสถาบันอุดมศึกษาเอกชนแห่งประเทศไทย  
ในพระราชูปถัมภ์ สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี

ปีที่ 5 ฉบับที่ 2 ประจำเดือนกรกฎาคม - ธันวาคม 2559

## Introduction

Since the late 20th century, the world has experienced a new era of technological advances. Today, innovations in all aspects of technology have spread faster than ever before. Chief among these is the Internet which has become an integral part of people's lives. Concomitant with the rise of the Internet is the popularization of online games, and with the present easy access to computer tablets and smart phones, access to and playing online games has never been easier. Unfortunately, the downside of such easy access is the high likelihood of game addiction. Game addiction can be explained as excessive and compulsive use of games in computers or in mobile phones that result in social and/or emotional problems; despite these problems, the gamer is unable to control this excessive use (Lemmens, Valkenburg, & Peter, 2009). Researches revealed that spending too much time playing online games can often lead to negative repercussions in one's life, from the psychological e.g., depression, loneliness, escape from reality, lack of self-control (Gordon, 2011), interpersonal e.g., social phobias, social avoidance, to poor performance on academic and school work (Wan & Chiou, 2006; Junmukda, & Natirutthakorn, 2007). It is hard to differentiate when the internet use becomes an addiction. Internet addiction can be defined as an impulse control disorder that is caused without intoxication (Young, 1999). It can also be inferred as a psychological dependence on the internet, regardless of what program or network one has signed in (Kandell, 1998). According to Beard and Wolf (2001) internet addiction was referred as the use of internet

to the extent it creates psychological, social or work difficulties in one's life. In this research game addiction and internet addiction are considered as separate variables. Internet addiction is the extensive use of internet that includes social networking, browsing and watching YouTube. Game addiction is only playing online games.

## Literature Review

### Internet Addiction and Game Addiction

Internet addiction and Game addiction have been researched extensively in the west and are considered current areas of concern for social researchers (Gentile, 2009; Lemmens, Holst, Valkenburg, Peter, & Goudriaan, 2010; Cole & Griffiths, 2007; King, Delfabbro, & Griffiths, 2012). In Thailand, even though researchers have identified that teenagers' Internet and gaming habits have increased considerably, there is a scarcity of empirical research (Phuphaibul et al., 2005.) According to the Thai Department of Mental Health, there are 2.5 million game addicted children out of a population of 18 million children in the country, and the number of addicted children has been growing constantly from 13.3% in the year 2007 to 14.4% in the year 2012 (Ferquest, 2013). These children grow up addicted to their habits and these are carried through to when they enter university. The negative sequelae of spending excessive amount of time on the Internet or playing online games are plentiful ranging from the physical (e.g., inadequate sleep, poor eye sight), psychological (e.g., stress, depression, anxiety), and social (e.g., low grades, skipping classes, stealing money, social avoidance, family problems, domestic

violence) (Junmukda & Natirutthakorn, 2007; Sota, 2011). A Thai version of game addiction test for children, adolescents and parents were developed with 16 items on 3 domains that are preoccupation with game, loss of control and functional impairment (Pornnoppadol et al., 2014)

### Self-regulation

Self-regulation is the ability of an individual to manage his own behavior through observation, evaluation, and consequence (Bandura, 1999). According to Bandura and associates (2003), self-regulation is how we control our behavior, and it consists of three steps: (1) self-observation (people look at other people in the environment and memorize ideas about it); (2) self-evaluation (people compare themselves with various standards from others or from one's own expectations); and (3) self-consequence or self-response (if others' judgment is good, then people will give themselves a reward such as a nice meal; but if it's bad, they give themselves a punishment such as feeling of guilt).

While playing games online or using the Internet can be fun and exciting (and therefore addictive!), many students tend to lose track of the amount of time they spend online (Seay et al., 2007). Self-regulation is therefore a very important cognitive tool to empower these students to monitor their online behavior, before they become affected negatively. It is very important to cope with potential addiction of Internet or game and this process has to start within one's self to efficiently have a check on this behavior. In a different light, Baumeister and associates (2007) defined the concept of self-control as being interchange-

able with self-regulation. Self-control refers to the ability to control one's desire to responses and bring them to many standards such as ideals, values, morals, and social expectations, and to support the pursuit of long-term goals. Low self-control can lead to many negative consequences such as educational problems, drug abuse, and game addiction. Children with high self-control tend to be calmer, can cope with frustration better, are less irritable and aggressive, concentrate better, and get higher grades in school than children who have less self-control (Funder & Block, 1989).

### Social support

To a large extent, social support can be a buffer in the extensive use of the Internet or online gaming among students. Social support refers to tangible or intangible support from other people around an individual (Cohen & Hobbeman, 1983) or through a person's relationships with other people (Longman et al., 2009). People who have high level of social support suffer less negative outcomes, both physically and psychologically (Cutrona & Russell, 1987). Social support may come from different sources such as family, friends, teachers, and community or any social group to which one is affiliated. There are three dimensions of support provided: warmth, behavioral control, and psychological autonomy-granting. These three dimensions can help develop positive self-conceptions and social skills, responsibility and competence, and impulse control that may reduce psychological problems. Social support can be a tangible resource provided by others and may come in the form of appraisal of different situations, effective coping strategies, and emotional support. Moreover,

it can reduce the amount of stress and help individuals cope better with stressful situations (Yasin & Dzulkifi, 2010).

### Depression, anxiety, and stress

Some researchers have argued that being on the Internet or playing online games can be considered a coping strategy for stress (Wood & Griffiths, 2007; King & Delfabbro, 2009) such that people who are stressed can distract themselves by playing games or using the Internet. However, the bulk of the research evidence suggests the contrary with depression, stress, and anxiety being positively related to the intensity of addiction to the Internet or online games (Young & Rodgers, 1998; Sota, 2011.) For example, Sota (2011) argued that online gaming could often lead to stress such as when the gamer is unable to meet the challenges in the game, lose the game, or not being able to progress to the next level of play. According to the Illinois Institute for Addiction Recovery (2012), pathological players may try to avoid normal social relationships and play games in order to hide their feelings of anger, depression, and low self-esteem. Several other researchers have also identified that subjects who were addicted to Internet have higher prevalence for depression (Ko et. al, 2008; Yen et al, 2007).

### The Present Investigation

Past studies have conceptualized the over use of the internet as an ‘Impulse control disorder model of internet addiction’ (Young, 1996). According to this model, those who are addicted to the internet or internet games exhibited problematic symptoms like those who are addicted to drugs, alcohol or pathological gambling. Furthermore, past research has also

shown that those who spend more time on the internet or playing online games have higher chances of experiencing depression, anxiety, and social phobias (Gordon, 2011; Young and Rodgers, 1998). Sota (2011) stated that over use of the internet or extensive gaming can lead to stress. Seay et al. (2007) argued that self-regulation can create awareness by the individual on the time they spend using the internet or playing online games. Such self-regulation can actually help them monitor and regulate their time while online. It was noted that those with higher self-regulatory skills cope better with stress. Social support is another positive factor in ameliorating the negative effects arising from Internet and online game addiction. Support from friends and family can reduce negative impacts such as depression and anxiety (Longman et al., 2009). Based on the above, it is hypothesized that Internet addiction and video game addiction are positively associated with the psychological states of depression, anxiety, and stress. Figure 1 presents the hypothesized path model incorporating the hypothesized interrelationships between the core variables.

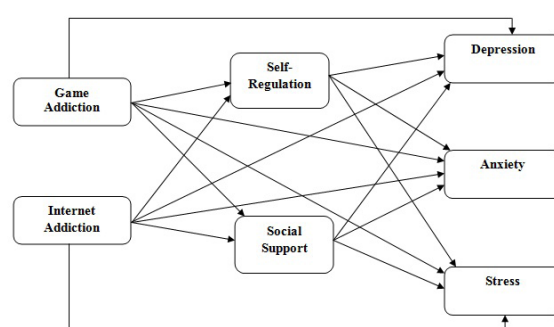


Figure 1: Path model of the hypothesized direct and indirect influences of Internet and online game addiction on depression, anxiety, and stress, being mediated by self-regulation and social support

## Research Objectives

The present study has been designed to (1) investigate the levels of Internet addiction, online game addiction, depression, anxiety, stress, self-regulation, and social support among university students in a Thai private University, and (2) investigate the direct and indirect influences of Internet addiction and online game addiction on the levels of depression, anxiety, and stress among Thai university students, being mediated by the students' reported levels of self-regulation and social support.

## Research Methodology

### Participants of the Study

Sample consists of 380 university students doing their undergraduate courses in Thailand. There were 162 males and 218 females.

### Material

The study's questionnaire consisted of six sections. The first section consisted of items written by the researchers to tap the participants' demographic characteristics of gender, age, and year of study.

The second section consisted of the 20-item Internet Addiction Scale (IAS) developed by Young in 1999 and is a five point Likert -type scale based on the DSM criteria for pathological gambling ranging from strongly disagree to strongly agree . The IAS is based on a revised version of the Young Diagnostic Questionnaire. The scale items were written to assess an individual's habits on the use of Internet, how he/she thinks about Internet, and those issues related to excessive use of Internet. Higher scores indicate higher levels of addiction.

Section 3 consisted of the 7-item Game Addiction Scale (GAS) which is 5 point Likert-type scale developed by Lemmens, Valkenburg, and Peter (2009). Each item was developed following seven criteria, namely: (1) Salience – when a person thinks playing a game is of utmost importance and is always preoccupied with the game, (2) Tolerance – When a person starts playing the game slowly and gradually increases the amount of time spent on the game; (3) Mood modification – the alternative feelings experienced from playing games, (4) Withdrawal – Negative or unhappy feelings /or physical impacts that happen when a person abruptly ends a game, (5) Relapse – after termination of playing games, the tendency to go back to the earlier pattern of playing games, (6) Conflict – can be between players, and (7) Problems –displacement problems as players concentrate more on games over activities such as school, work, and other normal interaction. Higher scores indicates higher addiction on games.

Section 4 consisted of the 21-item Depression, Anxiety, and Stress Scale (DASS-21) developed by Lovibond and Lovibond (1995). The DASS-21 consists of three subscales designed to assess the three negative symptoms of depression, anxiety, and stress. Each subscale comprises seven items that reflect negative symptoms experienced during the past week. The score of each subscale can be computed by summing up the scores of the items in each subscale and multiplying it by two; and the higher the score, the more severe the symptoms.

Section 5 consisted of the 63-item Self-Regulation Questionnaire (SRQ) developed by Brown, Miller, and Lawendowski (1999).

Self-regulation can be defined as one's capacity to develop, implement, and maintain planned behavior leading to one's goals. The SRQ is scored on 5-point Likert scales with high scores indicating (intact) better self-regulatory capacity and low scores indicating lower (impaired) self-regulatory capacity.

Section 6 consisted of the 24-item Social Provisions Scale (SPS), which was developed Cutrona(1984) to assess the provisions of social relationships. The six provisions include: (1) guidance (advice or information), (2) reliable alliance (assuring the support of others in time of stress), (3) reassurance of worth (acknowledging one's proficiency), (4) attachment (bonding), (5) social integration (belongingness), and (6) opportunity for nurturance (social support). The SPS is scored on 5-point Likert-type scales with higher score on the social provision scale indicating better perceived social support.

## Procedure

After receiving permission from the university to conduct the study, the study's questionnaires were distributed to the university students either before or after their classes. Participation was completely voluntary and their anonymity and the confidentiality of their responses were guaranteed. Participants were also informed that they could leave the study at any time with no penalty. The participants were also informed that the collected data will only be used by the study's researchers and only for the purpose of this study.

## Results

Means and Standard Deviations for the Seven Factors of Internet addiction, game addiction, depression, anxiety, stress, self-regulation, and social support

**Table 1 Means and Standard Deviations for the Seven Computed Factors**

	Mean	S.D.	Midpoint
Internet Addiction	2.80	0.70	2.5
Game addiction	2.23	0.86	3.0
Depression	2.00	0.62	2.5
Anxiety	2.07	0.60	2.5
Stress	2.09	0.58	2.5
Self-regulation	3.19	0.27	2.5
Social support	3.51	0.55	2.5

Table 1 presents the means and standard deviations for the seven computed factors and their respective midpoints. From the means, it can be seen that the participants rated themselves higher on Internet addiction but lower on online game addiction. The participants also rated themselves as low in terms of their levels of depression, anxiety and

stress (below their respective mid-points). In terms of self-regulation and perceived social support, the findings clearly showed that the participants rated themselves as high in both self-regulatory behavior and the amount of social support that they receive (above their respective mid-points).



## Path Analysis

The hypothesized direct and indirect relationships represented by the path model (Figure 1) were tested using path analysis via regression analysis. The analysis involved: (1) regressing the dependent variables of depression, anxiety, and stress on the predictor variables internet addiction, game addiction, self-regulation, and social support, and (2) regressing the mediator variables of self-regulation and social support on the predictor variables of internet addiction and game addiction.

The results of path analyses are presented in Figure 2. For the clarity of interpretation of results, only those path coefficients that are statistically significant ( $p < .05$ ) are shown in the figure.

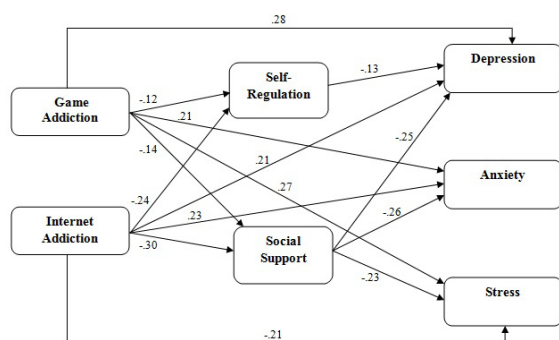


Figure 2 Path model of the direct and indirect standardized regression coefficients between Internet and online game addiction with depression, anxiety, and stress, being mediated by self-regulation and social support

Results from the path analysis indicate that both Internet and online game addiction have direct influences on the three criterion variables of depression, anxiety and stress. For online game addiction, the more the participants' rated themselves as being addicted to online gaming, the higher their reported levels of depression (Beta=.28), anxiety (Beta=.21),

and stress (Beta=.27). For Internet addiction, the more the participants' rated themselves as being addicted to the Internet, the higher their reported levels of depression (Beta=.21) and anxiety (Beta=.23), and the lower their reported level of stress (Beta=-.21).

The results also showed that both Internet and online game addiction have indirect influences on the three criterion variables of depression, anxiety and stress. For online game addiction, the more the participants' rated themselves as being addicted to online gaming, the lower their reported levels of self-regulation (Beta=-.12) and social support (Beta=-.14). The lower their reported level of self-regulation, the higher their reported level of depression (Beta=-.13). The lower their reported level of social support, the higher their reported levels of depression (Beta=-.25), anxiety (Beta=-.26), and stress (Beta=-.23).

For Internet addiction, the more the participants' rated themselves as being addicted to the Internet, the lower their reported levels of self-regulation (Beta=-.24) and social support (Beta=-.30). The lower their reported level of self-regulation, the higher their reported level of depression (Beta=-.13). The lower their reported level of social support, the higher their reported levels of depression (Beta=-.25), anxiety (Beta=-.26), and stress (Beta=-.23).

## Discussion

The results indicated that the university students have above average levels of internet addiction, but game addiction level was below average. The university students have more inclination on internet use, which includes social networking, watching YouTube and general browsing. Anderson (2001) stated that there

could be several reasons that may account for higher frequency of Internet use among college students, they might use Internet to do their homework or to research information for their studies. The excessive internet use can be due to unlimited internet access, poor time management, newly found freedom they get when they are away from the control of their parents, no real check of what they see or do online, total encouragement from teachers and staff for study related issues (Young, 2003). This can also be due to the rapid growth in social network sites and the trend among the college community to engage in social networking, many college students have become dependent on these sites to communicate with their friends and families.

Game addiction level was reported as much lower than average, which again indicates that online gaming tendencies were not very high among the university students in Thailand. Weinstein (2010) stated that game addiction is the excessive or compulsive gaming that interferes with daily life. Gamers may play excessively and isolate themselves from social life and focus only on in-game rewards. The present sample obtained was from the respective classes. Those who had higher game addiction would have missed their classes and stayed home. The According to Gentile (2009), addicted behavior does not mean that the person merely does something a lot, but it has to cause negative consequences in some aspects such as family, social, school, or work, physically or psychologically.

Depression, anxiety and stress levels of the participants were lower than the average, which indicates that the university students did not experience remarkable depression, anxiety

or stress. The results also indicated that they had higher levels of social support and self regulation. The university students have good support from friends, family and teachers or university officials. The university students reported higher level of self-regulation which again indicates their skills in time management .Internet use probably maybe for finishing their home work or researching on academic information.

### **Internet addiction, Depression, Stress and Anxiety**

Researchers have conceptualized that Internet addiction is more like an obsessive-compulsive disorder without using an intoxicant (Whang et al, 2003). The results of the present research indicate that the student participants have high Internet addiction and also have a direct positive influence on depression, anxiety and a negative influence on stress. Jones et al. (2007) stated that college students exhibit higher use of the Internet than found in the general population of Internet users and therefore, may be at a higher risk of experiencing Internet related problems (Young, 2004). There is also adequate evidence that when someone is addicted to Internet, there is a tendency that they lose track of their time or often forget their basic needs. It was also stated that the withdrawal from the real life relationships can increase social isolation and that might lead to depression (Young 1998). Anderson (2001) researched on Internet dependence on 1,302 college students from eight colleges and universities regarding their Internet use and the influences on their lives, both academic and social. The findings of his study clearly indicated that Internet use negatively



affects the academic work. These reasons can explain the tendency of the university students to be depressed due Internet addiction. The more internet addiction they have lower was their level of stress. When students enter the university they might have difficulties in adapting to university life, which may lead to, loneliness and they might resort to the use of Internet to alleviate these feelings and that might lower their level of stress.

People in general experience anxiety. University or college students face developmental, psycho-social and academic challenges that increase their risk of experiencing higher anxiety. A research on college students stated American young adult's predominance of anxiety increased from 7% in 2000 (American College Health Association, 2000) to 13% in 2007 (American College Health Association, 2009). It was also identified that problematic use of Internet can enhance the social fears and avoid social interactions (Lee & Stapinski, 2012). This can be explained when they don't get the net or Wi-Fi connection is slow, they become impatient and restless leading to anxiety. In social networking, after sending a message they get really worked up when they don't get immediate responses. When there is a delay in response they might become more anxious.

### **Game Addiction, Depression, Anxiety and Stress**

The present research indicates that game addiction has an influence on depression, anxiety and stress. This is in line with Gentile et al. (2011) research that stated people who use games excessively have greater chances of becoming depressed, have more chances

of becoming anxious and developing social phobias. There are cases where students may use games as a means to cope with stressful situations in their daily lives (Wood & Griffiths, 2007; King & Delfabbro, 2009). It is interesting that research identified depressed or stressed individuals use games as a means of coping with their emotions, especially violent games which may, in some circumstances, offer some feeling of control, power, and dominance while also allowing the player to accomplish tangible and immediate goals in the game (Nabi et al., 2006). Another study showed that depression, anxiety, social phobia, and school performance become worse when the individual gets addicted to games; the situation, however, gradually improves when the individual ends the addiction (Gentile et al., 2011). Excessive gaming can consume their valuable time that otherwise would have spent with their close-knit family, friends and social circle. This would lead them to be more aloof and would have loneliness and that could in turn lead to stress (Nie, 2001). This can also provoke them from neglecting their academic work, family responsibilities and financial issues that could lead to stress (Griffiths, 2008; McKenna & Bargh, 2000).

### **Game Addiction, Internet Addiction, Self-Regulation and Depression**

Game addiction and Internet addiction had an indirect influence on depression mediated by self-regulation. The university students reported higher level of self-regulation which again indicates their skills in time management. Internet use probably maybe for finishing their home work or researching on academic information. As they finish their daily activities such as homework or household

chores, academic work they may stay up late or even wake up earlier to play games, despite less time to sleep or rest. The current finding, however, is consistent with that of Seay et al. (2007) who reported that individuals with high self-regulation tend to have lower risk of problematic gaming. Junmukda and Natirutthakorn (2007) argued that the high risk of game addiction among Thai Students might be due to low self-regulation. These results were not in compliance with the present research. The respondents of the present research did not report high game addiction probably because they have grown up and become more responsible. They also seemed to have higher self-regulatory skills. The more addicted the students were to internet or games, lower was their self regulation, lower their self regulation higher was their depression. When the students are into any addiction game or Internet, they miss their deadlines and there will a lot of back log in their day-to-day academics and this can bring depression among students. Perhaps further exploration of these variables is needed to obtain more definitive results.

### **Game Addiction, Internet Addiction, Social Support and Depression, Stress and Anxiety**

The research also revealed an indirect relation between game addiction and internet addiction on depression, anxiety and stress. The results indicates that lower addiction on Internet or games, higher were their social support and higher their social support lower were their stress, anxiety and depression. When students face problems in their day-to-day lives and if they can turn to their friends and

families, they have less chances of getting tensed leading to higher levels of depression, anxiety and stress. The more they use Internet or games they have no time to interact with their friends and families leading them to depression, anxiety and stress.

The implications of this study in terms of the role-played by social support and self-regulation would have profound significance. The mediating effect of social support and self-regulation emphasizes the concerned individuals and groups should endeavor to take corresponding action aimed at decreasing the Internet and game addiction and enhancing the self-regulatory skills. Institutions can help vulnerable students to empower themselves against the ill-effects of excessive and extreme computer usage, by training them with self-regulatory skills and proving support by having face-face interactions. Moreover, the research can also enhance the awareness to the society on the dangers of Internet and game addiction to take precautionary measures.

### **Conclusion**

It can be concluded that university students in Thailand have higher internet addiction and did not have high game addiction. The university students in Thailand also have higher social support and self regulatory skills. The internet addiction on university students can have negative influences such as depression and anxiety. The game addiction on university students can lead to depression, anxiety and stress. Internet addiction and game addiction have an indirect influence on depression mediated by self-regulation and they also have an indirect influence on depression, anxiety and stress mediated by social support. It is

recommended to instill self regulatory skills among university students.

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