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Santosh Shivappa Kottalgi
Johnson & Wales University - Providence

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A Research Proposal: Policy Issues of Video Game Addiction

Santosh Shivappa Kottalgi

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Abstract

The advances in computational power and high-speed internet are making digital games more interactive and entertaining as a popular leisure activity, leading to the rapid growth of the gaming industry globally. Game players are spending an increasing amount of time, money and energy to the extent that in many cases it is leading to game addiction (Griffith, 2002). Few games can be used for educational (Freitas & Griffiths, 2007) and medical treatment purpose to accelerate the cognitive learning of human being (Gentile et al.,2009), however, such needs are few. Due to pressure from families, doctors, educational institutions and even law enforcement agencies, policymakers in various countries are forced to come up with video game reduction policies (Király et al.,2018). Such policies are having limited impact because policymakers are struggling with conflicting demand of reducing video game addiction among players and still helping video game industry to flourish. The dilemma is the major reason for the absence of an inclusive game addiction reduction policy. This study will propose areas where policymakers should focus to improve the inclusiveness of the policy.

Keywords: Video game, game addiction, policies, MMORPG, addiction reduction, online game, mobile game, gaming industry, revenue growth.

Introduction

The benefits that video game players get from playing video games could be educational (Freitas & Griffiths, 2007), social and therapeutic (Gentile et al.,2009). However, evidence has shown that when played in excess, video game playing could become addictive (Griffith, 2002), especially online video game playing where the game never ends and has the potential to be a 24/7 activity. The increasing popularity of social networking and online gaming is making even more people addicted to it. Gaming addiction has become a global social issue affecting families around the world and countries like China, Korea, Vietnam, Japan, U.S.A., and Canada are affected the most. The negative impacts of online game addiction may be that the students can drop out of the school, disrupt their friendships and family relationships (Griffiths, 2002), juvenile delinquency, and even suicide. The game players who suffer from loneliness, depression, and aggression have higher chances of game addiction than healthy game players (Jeong, Kim & Lee, 2016).

Considering a growing public health issue of addictive gaming, it raises the possibility of introducing or strengthening governmental regulation (Park & Ahn, 2010), similar to alcohol consumption, gambling, and drug abuse. South Korea, China, and few Asian countries have created governmental policies regarding problematic gaming, however, regulations in the Western world are mainly limited to the rating systems evaluating content and age-appropriateness rather than overuse, which makes rating based efforts highly inadequate. For example, in Europe, the Pan European Game Information (PEGI) and in North America, the Entertainment Software Rating Board (ESRB) rating systems are used (Laczniak et al.,2017).

Though efforts to address the gaming addiction are ongoing, they are mostly limited to the specific country or region. Also, these efforts are achieving limited success in absence of

inclusive policy framework and lack of global acceptance of such policies even though most of the games are played through the internet and multiple players play the game across the world, through massively multiplayer online role-playing games (MMORPGs) (Hussain, Griffiths & Baguley, 2011). In spite of the need for regulations, care has to be taken to avoid too much regulation affecting the growth of the gaming industry (Park & Ahn, 2010). Hence there is a need for a global and inclusive video game addiction reduction policy supported by governments globally as well as self-regulation from gamers and game developing companies. The present study will try to suggest the factors which are the most important and should be considered while creating such a policy framework. It will also try to add a few forward-looking suggestions which can increase the present scope of the policy in the future towards even higher acceptance and implementation.

Problem Statement

There is a need to come up with a globally acceptable inclusive game addiction reduction policy and still ensure the growth of the gaming industry. This policy must be implemented by the governments in the respective countries and supported by game players and game developing companies for its success. Unfortunately, there will be too many factors that can be included in the policy to make it effective. The author through literature review will try to find some of the most important factors that policymakers can consider and will study their importance through research.

Purpose of the Study

Identification of the right candidates with a high propensity for addiction is vital because if the research can show the progress with these candidates then chances are very high that less addicted candidate can show much better improvements. To identify such candidate authors will

review whether there are any co-relations of addiction with the type of games, demographic characteristics of the players, psychosocial characteristics of the players and structural characteristics of the game.

Once candidates are identified, authors will study the *preventive* measures that can be implemented to educate players about the negative impacts of the games. Such as the possibility of usage of a game rating system to guide players to select an age-appropriate game, add education videos of negative impacts of excessive gaming when a player reaches a certain duration of gameplay, and a warning message on the game CD and at the game home page to avoid excessive usage.

While players are experiencing a push back through preventive measures to avoid excessive play, the author proposes few *self-regulation* measures to be implemented by the gaming industry to reduce the access of the games to the players. Self-regulation measures can accelerate the impact of preventive measures. Both preventive and self-regulation measures may reduce game usage by players and affect negatively to the revenue of the gaming industry. The negative impact may work as a deterrent for the industry to avoid co-operation to any de-addiction policies. Hence *revenue growth* measures will be proposed for the growth of the gaming industry.

If it challenging to achieve a high success rate in de-addiction for all the players, so the author proposes a post-addiction *remedial treatment* program for players and their family members. A treatment program for symptomatic, psychosocial, and personality characteristics of the gamers and their family members can be discussed.

The author understands that the above scope is too large for this research proposal so the author will try to provide a narrowed focus group for identification measures through a literature

review. For understanding the outcome of preventive, self-regulation and remedial measures the author proposes creating two groups. The first group will not experience any of the policy measures and the second group will experience all the de-addiction measures. The study will be done for a year and at the end of the year, a survey will be done to check the effectiveness of the policy measures by comparing the addiction level of the game players. Another outcome of the survey will be to check the effectiveness of each measure in reducing the game addiction. A third survey will be done to check whether gaming companies are positive to implement the preventive and self-regulation policies as a permanent solution and revenue growth policy measures are supportive of healthy industry growth. The outcome of the research work will be provided to policymakers as guiding factors to create an inclusive policy.

Significance of the Study

Any policy which does not address concerns of both gamers and the gaming industry will experience limited success. To address this limitation, there is a need to have an inclusive study which can provide enough experience to decide the importance of the various measures in the success of the policy. Only then, an inclusive policy which is a win-win for game players and gaming industry can be created. This study is a vital step in that direction and will try to achieve enough experience through a yearlong study for a credible outcome to help policymakers to use the outcome as guidelines.

Research Questions

Three questions will be addressed:

1. Whether the regulatory steps are effective in addressing contradictory goals of reducing game addiction among gamers and still help the gaming industry to grow?
2. Which steps are most impactful for gamers and the industry?
3. What insights will game policymakers gain to frame the digital game de-addiction policies?

Hypotheses

The research will attempt to test the following hypotheses:

H1: The educational and self-regulation steps by the game company are most important in reducing game addiction.

H2: The growth plan for the industry and self-regulation steps taken by the industry are acceptable to the gaming industry.

Literature Review

An adverse impact of excessive and compulsive digital games is game addiction and unhealthy daily life. Different studies are referring game addiction as “problematic game use”, “problematic gaming”, “pathological video gaming”, “Internet gaming addiction”, “Internet gaming disorder”, and “gaming addiction”. Game addiction or IGD (Internet Gaming Disorder) has been included in section III of DSM-5 (Diagnostic and Statistical Manual of Mental Disorders 5th Version, May 2013) as a condition for additional study (APA, 2013).

Game addiction phenomena are mainly associated with the amount of time or money spent on gaming, insufficient sleep, and lack of interpersonal relationships. Often online game

addicts consider gaming a substitute source of real-life satisfaction, fulfilling their needs when they are not satisfied with their real lives. In this way, gaming becomes a vital part of their lives, which in turn brings about negative outcomes, such as psychological concerns, physical issues, and professional/academic problems.

There are three types of video games namely 1. Educational, 2. Pro-social (non-violent games based on sharing and helping each other), 3. Violent (Gentile et al., 2009). Although earlier researchers have documented a relationship between violent video games and aggressive behaviors, little is mentioned about positive impacts of games, especially prosocial games. In prosocial games, characters help and support each other in nonviolent ways, which researchers believe increases both short-term and long-term prosocial behaviors among players. Gentile et al. (2009) conducted three studies in three countries with three age groups to test this hypothesis. The study found Singaporean middle-school students who played more prosocial games behaved more prosocial. Similarly, Japanese children and adolescents who played prosocial games showed increased prosocial behavior. In the U.S. A., undergraduates who were randomly assigned to play prosocial games behaved more prosocial toward another student. These similar results across different countries, methodologies, ages, and cultures provide robust evidence that prosocial games help, and provide support for the General Learning Model. Educational and Prosocial games have shown a positive impact in improving game player's social skills and are also being used for therapeutic clinical practices (Gentile et al., 2009; Freitas & Griffiths, 2007). On the other hand, while studying violent games relationship with game players, Griffiths (2007) studied and hypothesized that the trait of aggression is associated with a higher online game addiction score (based on the trait theory). Aggressive behavior may play a role in fostering the development of online gaming addiction. The preference for violent games is strongly associated

with excessive game use. Excessive adolescent male players prefer to play violent video games and aggressive children are attracted to violent games. Considering the outcome of Griffiths (2007) and Gentil et al. (2009) study it was observed that violent games are the most popular among the three and are the main cause of addictive behavior. Hence, the author of the current study proposes to consider only violent games for a research study.

Rooij et al. (2014) conducted a study to explore the nature of problematic (addictive) video gaming (PVG) and the association with game type, psychosocial health, and substance use. The study gathered data using a paper and pencil survey in the classroom setting. Three samples were aggregated to achieve a total sample of 8478 unique adolescents. The study included measures such as game use, game type, the Video game Addiction Test (VAT), depressive mood, negative self-esteem, loneliness, social anxiety, education performance, and use of cannabis, alcohol and nicotine (smoking). The study found that problematic gaming was common among adult gamers who play multiplayer online games. Boys (60%) were more likely to play online games than girls (14%) and problematic gamers were more likely to be boys (5%) than girls (1%). High problematic gamers showed higher scores on depressive mood, loneliness, social anxiety, negative self-esteem, and self-reported lower school performance. Nicotine, alcohol, and cannabis using boys were almost twice more likely to report high PVG than non-users. It appeared problematic gamers do seem to play online games more often, and a small subgroup of gamers, specifically boys, showed lower psychosocial functioning and lower grades. Even though, game players are of all age groups and can have any gender, study by Rooij et al. (2014) observed that young males have more chances to get addicted than girls. To understand which age group is more prone to addiction, the author reviewed the study of Wittek, et al. (2015). The study investigated prevalence rates and predictors of video game addiction in a sample of

gamers, randomly selected from the National Population Registry of Norway ($N=3389$). The results identified that being of the male gender, being young (16-30 years), living alone, being born in Africa, Asia, South America or Central America, scoring low on conscientiousness, scoring high on neuroticism, and having poor psychosomatic health increases chances of game addiction. Taking note of the study of Rooij et al. (2014) and Wittek, et al. (2015) the current research work proposes a selection of males between the age group of 16 to 30 years. There are many important other factors suggested by the two research studies, but for the sake of increasing the focus of current research only important factors are considered and other factors will be considered for future work.

A variety of perspectives and approaches have been used to assess the driving factors of digital game addiction. The previous game addiction studies focused on various factors such as motivations for playing, personality traits, structural characteristics of the game, cultural and social factors, etc. (Kuss & Griffiths, 2012). Recently, several researchers suggested that psychosocial factors such as aggression, depression, and loneliness may induce individuals to become addicted to online games (Rooij et al., 2014; Wittek, et al., 2015). There have been several studies that empirically tested the effects of depression and loneliness on aggression. Jeong, et al. (2016) found there are relationships among the psychosocial constructs (i.e., depression, loneliness, and aggression) and their effects on game addiction. Hence, the author also proposes to conduct Young's Internet Addiction Test (IAT) (Young, 1998) (See Appendix A) on candidates to identify the level of game addiction, aggression, loneliness, and depression to shortlist candidates for research work.

Among various types and forms of video games, MMORPGs may be more problematic for at-risk individuals than other game types (Griffiths, 2009). This is because intense

involvement in MMORPGs demands great time investment and potentially brings about negative outcomes in daily life for certain individuals. Besides, MMORPGs not only appeal to a wide range of players but also deal with fantasy, providing real-life simulation and role-playing with interactive real-time services because they are highly interactive, social, and competitive. Allowing game users to choose various characters within a phantasmal world makes the players feel free from social anxiety. Considering MMORPGs are more likely to induce addiction because they are played for a longer duration than other games to achieve game levels. Moreover, it is observed that the duration of video gameplay has a significant impact on addiction (Hussain et al., 2011). Therefore, MMORPG gamers with more than 4 hours a day playtime will be selected for the study.

Since research aim is to create a globally acceptable policy, the game players will be selected globally from various countries, especially with a higher percentage from China, South Korea, the U.S.A., Europe, U.K., Australia, and Canada. The candidates will be invited for participation through an online registration process and will get a monetary reward for participation.

PEGI and ESRB game rating systems are being used for long to educate parents and players about violent games and the age appropriateness (Laczniak, 2017). Laczniak, et al. (2017) studied whether ESRB ratings are an effective tool for parents seeking to enhance their mediation efforts and ultimately reduce their children's play of violent video games (and their children's corresponding engagement in negative behaviors, such as getting in fights at school). Results demonstrate that children of parents who employ restrictive mediation efforts tend to play less violent video games, and the effect of these efforts is enhanced when parents use the ESRB system. This moderated effect also extends to reduce children's engagement in negative

behaviors in school. These findings suggest that both the video game industry and the government could play a role in establishing and maintaining educational programs whose purpose is to inform parents/caretakers about the potential usefulness of the ESRB guidelines. The effectiveness of such a rating system encourages authors to consider them for the research work as a preventive measure. Candidates will be given video games but with the rating system mention on its CD or game home page, so that players or their parents can select age-appropriate video game for the players.

Turel, et al. (2014) studied the core ideas of the health belief model and suggested that short informational videos on internet 'addiction' can be an effective means towards preventing problematic use of the internet through their ability to drive changes in viewers' attitudes towards reducing their internet use. Building on the heuristic-systematic model of information processing viewpoint, it was further suggested that this attitude change was guided by the information the videos provide, as well as the surprise emotion they generate. To test the model, Turel, et al. (2014) collected the data from 223 participants who were exposed to information video. Partial least-square analyses indicated that the videos were efficacious in improving viewers' attitudes towards reducing their internet use. Based on the efficiency of this study, the author decided to use this concept for video game addiction reduction. The author will study the effect of playing an informative video explaining the negative effects of excessive gaming after players play for a continuous 4 hours.

There is substantial literature that suggests graphic tobacco warnings are effective; however, there was limited evidence based on actual smoking behavior. Hence, Azagba & Sharaf (2012) researched to assess the effect of graphic cigarette warning labels on smoking prevalence and quit attempts. Their study considered a nationally representative sample of individuals aged

15 years and older from the Canadian National Population Health Survey 1998–2008. The sample consisted of 4,853 individuals for the smoking prevalence regression and 1,549 smokers for quit attempts. The generalized estimating equation (GEE) model was used to examine the population-averaged (marginal) effects of tobacco graphic warnings on smoking prevalence and quit attempts. To assess the effect of graphic tobacco health warnings on smoking behavior, they used a scaled variable that takes the value of 0 for the first 6 months in 2001, then increases gradually to 1 from December 2001. The researchers found that graphic warnings had a statistically significant effect on smoking prevalence and quit attempts. In particular, the warnings decreased the odds of being a smoker (odds ratio [*OR*] = 0.875; 95% *CI* = 0.821–0.932) and increased the odds of making a quit attempt (*OR* = 1.330, *CI* = 1.187–1.490). The author of the current research wants to study whether such a warning message can be used as a proactive measure to deter video game players from playing violent games. To achieve this, the author proposes, showing a warning message to the users on the video game device and home page of the game to distract the attention of players.

Reduction of a video game-based addiction is not possible without participation from the gaming industry. In self-regulation measures, without intervention from the government, game companies adopt a fatigue system voluntarily to reduce the number of addicted game users. Despite acknowledging the importance of the policy, the game companies do not want to adopt it because they believe it will reduce both the number of game users and revenue. To increase adoption of self-regulation policy, a tax and rebate policy is also proposed in South Korea (Park & Ahn, 2010). Tax will be levied like the environmental pollution and tobacco tax, but a tax rebate incentive of 25% also will be there to ensure overall revenue of the industry will not drop. The research study plan to test such self-regulation measures and tax and rebate measures.

Internet Gaming Disorder (IGD) is having severe consequences for game players and their families, especially young male players. There is a need for a post addiction treatment program which can define and address the need for symptomatic, psychosocial, and personality characteristics of these patients and their family members. González-Bueso et al. (2018) investigated the effectiveness of cognitive-behavioral treatment (with and without the addition of a psychoeducational group for parents) in a sample of patients with IGD and assessed the therapy outcome utilizing survival analyses of these two conditions. Besides, researchers explored the psychopathological and personality characteristics of the participants compared with a healthy control group. The study found compared with healthy subjects, the patients showed higher scores in several personality characteristics (i.e., Introversive, Inhibited, and Histrionic, Identity Confusion, Self-Devaluation, and Peer Insecurity) and lower scores in Egotistic personality scale. After the treatment, the patients reported less general symptomatology and less diagnostic criteria for IGD. Considering the positive observation of González-Bueso et al. (2018) study, a cognitive-behavioral treatment on reducing symptomatology will be performed online during the research work. It will be done online because all the patients will be in different parts of the world. The effectiveness of the treatment program will be tested as part of the research work.

Methodology and Design

To approach the research work, the literature review has provided valuable inputs for candidate identification measure of the research. The suggestion from the literature review is to focus on the male candidates; between 16 to 30 years of age; who are playing on an average more than 4 hours of video games daily; are players of violent video games and prefer MMORPG games. The players will be registered voluntarily through an online participation program. Players will be rewarded for participation through the monetary payment of \$200. The

players will be informed that they will be playing a controlled gaming environment for a year. Their family members will consent of the participation and will participate themselves for post-addiction treatment as needed.

Two groups will be created; one group will go through a controlled video game experience whereas the other group will not experience any such controlling measures.

Moreover, the gaming industry will also be requested to register voluntarily for this research work. Monetary payment of \$2000 will be given to a gaming company for its participation in the research for a year. The gaming company will also agree to create copies with the self-regulated and proactive measures implemented in the versions of the video games for the first group of players. Company will provide the unregulated version of the games to the second group of players.

The regulated group will use the games which have game ratings mentioned on it and are appropriate to their age group. The game company will add an educational video highlighting the addictive nature of the game after continuous play of more than 4 hours. There will be a warning message about the addictive nature of the game on the game CDs and the home page of the game.

Self-regulation by game company will be done as per the guideline of the fatigue system (Park & Ahn, 2010) in which gaming company will force players to take a compulsory 30 min break after 4 hours of continuous gameplay, or will reduce the 25% game points for every 30 minutes of additional play to encourage the players to take brake rather than waste 25% points. Lastly, games will be blocked to play between midnight to 8 am as per local time so that players can have enough sleep.

As a final step, game players and their family members will go through a month-long online post-addiction remedial treatment program (González-Bueso et al., 2018). The online treatment program will aim to treat symptomatic, psychosocial, and personality characteristics of the patients and their family members.

Addiction level of both the group will be studied at the end of one year through a survey. Both the hypotheses will be evaluated and analyzed against the observations from the surveys (See Appendix A & B). The game company will provide its feedback for the acceptance of the self-regulation measure and the impact of the 25% tax rebate they received for implementing the revenue growth measures through a feedback survey (See Appendix C).

Population and Sampling

To make the research work effective, a sample group of more than $N = 1000$ will be selected in each of the groups. So, a total of more than 2000 candidates in total. There are likely chances that few participants may drop out, so the author expects that final participant count will be $n = 900$ in each of the group. This group size is large enough to provide adequate data for a reliable conclusion of the study and will also be financially viable for research completion.

Instrumentation

Young's Internet Addiction Test (IAT) Scale (Young, 1998) for game addiction, aggression, loneliness, and depression will be used to shortlist candidates for research work and to check the effectiveness of the research work post 1 year of study. These tests are written in the form of questions (See Appendix A for test questions) to be answered based on a 5-point Likert scale where 1 means "strongly disagree" and 5 "strongly agree".

The author proposes and created a survey *Feedback survey from players of the effectiveness of the policy measures* to rate the effectiveness of the proactive measures, self-

regulation measures, and whether post-addiction treatment was effective. The questions (See Appendix B) to be answered based on a 5-point Likert scale where 1 means "strongly disagree" and 5 "strongly agree".

The author proposes and created a survey *Feedback survey from the gaming company for the effectiveness of the policy measures* for the gaming company to rate the effectiveness of the measures implemented in proactive, self-regulation and growth plan. The questions (See Appendix C for survey questions) to be answered based on a 5-point Likert scale where 1 means "strongly disagree" and 5 "strongly agree".

Procedure and Time Frame

The online registration process for game players will be opened for 3 months with all the guideline and terms and condition of the research study detailing the process, and taking consent for the play, usage of feedback data, usage of test result, publication of findings, details of medical treatment, parental approval and reward payment.

The similar, online registration process for the gaming industry will be opened for 3 months with all the guideline and terms and condition of the research study detailing the process, and taking consent for creating a specialized versions of the games with policy measures, usage of feedback data, usage of test result, publication of findings.

The candidates suitable for the study will be filtered, tested for the initial levels of addiction. Game company will also create copies of games for both the groups. Duration of 1 month will be assigned to complete the process. After that, the research study will be done for 1 year. Post completion of 1 year, candidates will be re-accessed for the addiction level, industry feedback will be analyzed, and final findings of the study will be published within the next 2 months.

In all, the entire process will be of 18 months.

Analysis Plan

To validate the proposed research, SmartPLS Version2.0.M3, a component-based partial least squares (PLS) technique will be used. SmartPLS is one of the software tools for partial least squares structural equation modeling. It has an easy to use and intuitive graphical user interface. PLS is a second-generation structural equation modeling technique that takes either an exploratory approach to explain a structural model (i.e., theories) or a confirmatory (hypothesis-testing) approach to determine the causal relationships among the latent variables (Hair, Hult, Ringle, & Sarstedt, 2013).

Based on the response to the survey in Appendix B and C, the author proposes the structural model. Model 1 will be analyzed to validate H1 (See Figure 1). Model 2 will be analyzed to validate H2 (See Figure 2).

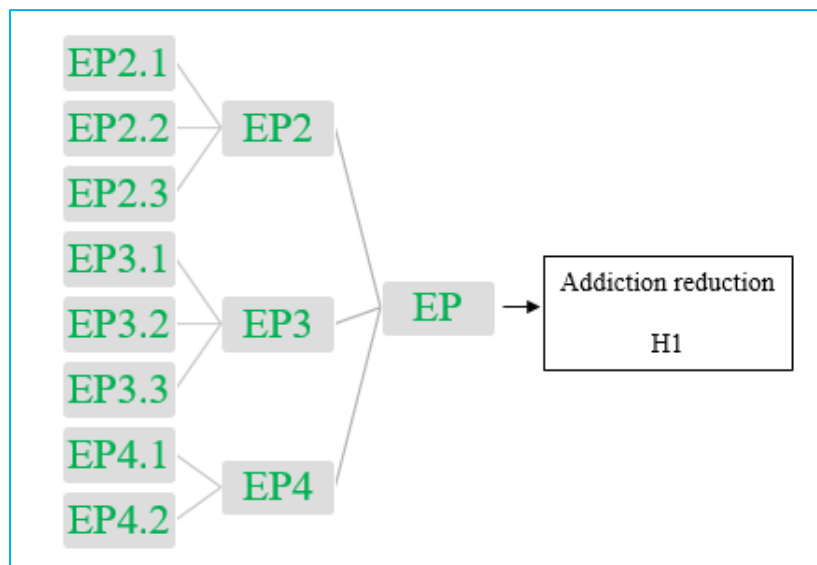


Figure 1. A validation model for Hypothesis H1

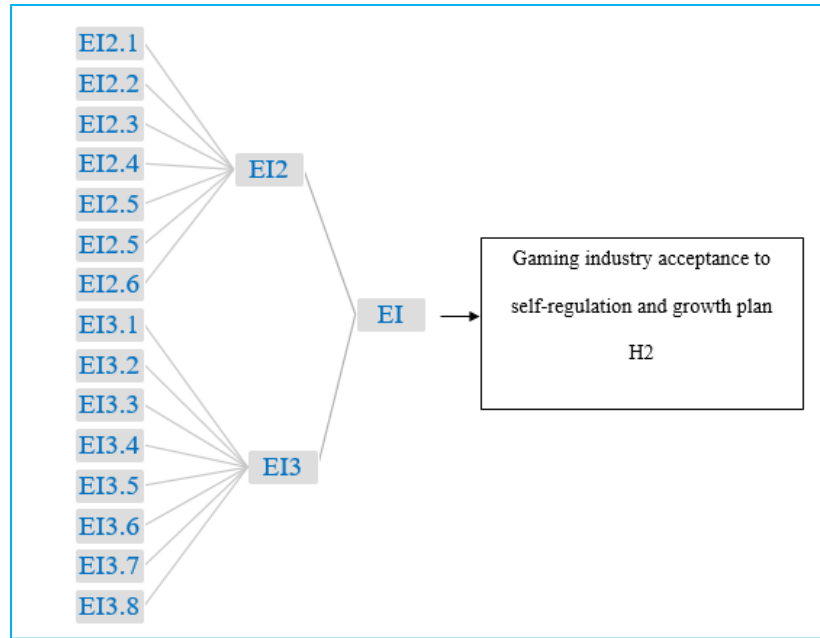


Figure 2. A validation model for Hypothesis H2

Validity and Reliability

The research study is going to provide abundant data due to more than 900 candidates submitting the survey feedback in each group. Initially, the construct of the survey will be tested using a few candidates for reliable outcome. Later internal-consistency method will be used for testing the reliability of the data based on the composite reliability values and value of more than 0.8 will be targeted. A Cronbach's alpha value of more than 0.7 will also be targeted. The convergent validity will be evaluated using the average variance extracted (AVE) values with a target of more than 0.5. Alpha levels for statistical tests will be set a conservative $\alpha = .01$.

Assumptions

The assumptions in the research proposal are, first, the expected number of candidates and game companies will register during the stipulated time frame of registration. Second, the survey response provided by the candidates and the game company will be true. Third, the online medical treatment process will be as effective as in-house treatment at the clinic facility. Fourth,

the tax rebate of 25% suggested for a company will be acceptable in all the countries. Lastly, the entire study will be completed within 18 months.

Scope and Limitations

Present study through research is identifying the candidates with the highest chances of game addiction. Relaxing these filters will allow the policy measure to be implemented on the wider user group, such as considering the females and age group of 12 to 16 and 30 to 50 years. It may be possible that these measures may not be as effective in other groups. Another limitation of the study is, results are highly dependent on self-reported feedback from the candidates and the game company. They may be untrue or misleading. Lastly, the constructs considered for research work are high impact constructs of the earlier research work, however, there could be other measures which may have a higher impact on addiction reduction when we are combining multiple constructs. The author suggests expanding the scope of this study in future by adding other constructs as well, such as, increasing the price of video game for play beyond 4 hours, reducing the aggression and violent factor of the game, adding parental consent for play beyond 4 hours, and reducing the playtime of the game below 4 hours to complete all the level of the games. Similarly, gaming company may also request for additional help to improve the revenue to implement the self-regulatory measures, for example, immunity from lawsuits due to the negative impact of the games on players or increasing its acceptance as a sport if played under the regulated criteria. There could be many other things where this research work can be expanded, and the author welcomes all such suggestions.

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Appendix A

Game addiction measurement test.

To be answered based on a 5-point Likert scale where 1 means "strongly disagree" and 5 "strongly agree".

Game Addiction Saliency (SA)

SA1. How often do you fear that life without games would be boring, empty and joyless?

SA2. How often do you snap, yell, or act annoyed if someone bothers you while you play games?

SA3. How often do you feel preoccupied with games when real-life or fantasize about being an in-game world?

SA4. How often do you choose to spend more time gaming over going out with others?

Excessive use (EX)

EX1. How often do you lose sleep due to late-night gaming?

EX2. How often do you try to hide how long you've been gaming?

EX3. How often do you feel depressed, moody, or nervous when you are off-line, which goes away once you are back gaming?

EX4. How often do you find that you play games longer than you intended?

EX5. How often do you neglect household chores to spend more time playing games?

Neglect work (NW)

NW1. How often does your work suffer (e.g. postponing things, not meeting deadlines, etc.) because of the amount of time you spend on playing games?

NW2. How often does your job performance or productivity suffer because of games?

Anticipation (AT)

AT1. How often do you find yourself anticipating when you will log in games again?

AT2. How often do you play games before something else that you need to do?

Lack of control

LC1. How often do you find yourself saying "Just a few more minutes" when gaming?

LC2. How often do you try to cut down the amount of time you spend on games and fail?

LC3. How often do others in your life complain to you about the amount of time you spend on games?

Neglect social life (NE)

NE1. How often do you prefer the excitement of game playing to intimacy with your partner?

NE2. How often do you form new relationships with fellow game users?

Loneliness- Positive Loneliness (PL)

PL1. How often do you feel that you are "in tune" with the people around you?

PL2. How often do you feel part of a group of friends?

PL3. How often do you feel that you have a lot in common with the people around you?

PL4. How often do you feel outgoing and friendly?

PL5. How often do you feel close to people?

PL6. How often do you feel you can find companionship when you want it?

PL7. How often do you feel that there are people who understand you?

PL8. How often do you feel that there are people you can talk to?

PL9. How often do you feel that there are people you can turn to?

Negative Loneliness (NL)

NL1. How often do you feel that you lack companionship?

NL2. How often do you feel that there is no one you can turn to?

NL3. How often do you feel alone?

NL4. How often do you feel that you are no longer close to anyone?

NL5. How often do you feel left out?

NL6. How often do you feel that your relationships with others are not meaningful?

NL7. How often do you feel that no one knows you well?

NL8. How often do you feel isolated from others?

NL9. How often do you feel that people are around you but not with you?

Depression Depressed Affect (DA)

DA1. I felt depressed.

DA2. I felt I am alone.

DA3. I felt sad.

Positive Affect (PA)

PA1. I felt that I was just as good as other people.

PA2. I enjoyed life.

Somatic & Retarded Activity (SO)

SO1. I did not feel like eating; my appetite was poor.

SO2. I felt that everything I did was an effort.

SO3. My sleep was restless.

Interpersonal Factor (IF)

IF1. People were unfriendly.

IF2. I felt that people disliked me.

Aggression

AN1. Some of my friends think I'm a hothead.

AN2. I am an even-tempered person.

Anger (AN)

AN3. I flare up quickly but get over it quickly.

AN4. I have trouble controlling my temper.

AN5. Sometimes I fly off the handle for no good reason.

Hostility (HO)

HO1. When people are especially nice, I wonder what they want.

HO2. I am suspicious of overly friendly strangers.

HO3. I sometimes feel that people are laughing at me behind my back.

HO4. I know that "friends" talk about me behind my back.

Physical Aggression (PH)

PH1. I have become so mad that I have broken things.

PH2. Occasionally, I can't control the urge to strike another person.

PH3. I have threatened people I know.

PH4. Given enough provocation, I may hit another person.

PH5. If somebody hits me, I hit back.

PH6. Some people pushed me so far that we came to blows.

PH7. I get into fights a little more than the average person.

Verbal Aggression (VA)

VA1. I often find myself disagreeing with people.

VA2. When people annoy me, I may tell them what I think of them.

VA3. I can't help getting into arguments when people disagree with me.

Appendix B

Feedback survey from players for the effectiveness of the policy measures (EP)

To be answered based on a 5-point Likert scale where 1 means "strongly disagree" and 5 "strongly agree".

Effectiveness of step -2 (EP2)

1. The rating system used for rating the video game is useful for selecting the age-appropriate video game.
2. An educational video highlighting the negative effects of excessive video game play is useful to reduce the playtime.
3. Warning message displayed on video CD; the home page of the game is useful to avoid the violent video game.

Effectiveness of Step 3 (EP3)

1. Time restriction for gameplay from midnight to 8 am is reducing your interest in the game.
2. Forcing players to take a break of 30 minutes after 4 hours of continuous play is reducing your interest in the game.
3. Reducing 25% of the game points for every hour of additional play after 4 hours of continuous play is reducing your interest in the game.

Effectiveness of Step 4 (EP4)

1. The post-addiction treatment process is useful for reducing interest in playing the video game.
2. Adding parents to treatment increases the effectiveness of the treatment.

Appendix C

Feedback survey from the gaming company for the effectiveness of the policy measures (EI).

To be answered based on a 5-point Likert scale where 1 means "strongly disagree" and 5 "strongly agree".

Effectiveness of step -2 (EI2)

1. The rating system used for rating the video game is acceptable to step for a positive image of the game.
2. The rating system used for rating the video game will not affect the revenue.
3. An educational video highlighting the negative effects of excessive video gameplay is useful for a positive image of the game.
4. An educational video highlighting the negative effects of excessive video gameplay will not affect the revenue.
5. Warning messages displayed on video CD; the home page of the game is useful for a positive image of the game.
6. Warning messages displayed on video CD; the home page of the game will not affect the revenue.

Effectiveness of Step 3 (EI3)

1. Time restriction for gameplay from midnight 12 to 8 am is useful for a positive image of the game.
2. Time restriction for gameplay from midnight to 8 am will not affect the revenue.
3. Forcing players to take a break of 30 minutes after 4 hours of continuous play is useful for a positive image of the game.

4. Forcing players to take a break of 30 minutes after 4 hours will not affect the revenue.
 5. Reducing 25% of the game points for every hour of additional play after 4 hours of continuous play is useful for a positive image of the game.
 6. Reducing 25% of the game points for every hour of additional play after 4 hours of continuous play will not affect the revenue.
 7. Tax rebate provided for implementing self-regulation steps is increasing the revenue.
 8. Will implement the suggestions from the policy post research for all the video games to support the policy regulations.
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