



EXAMINE THE ASSOCIATIONS BETWEEN SELF-EFFICACY, PEER INFLUENCE,
AND IMPULSIVITY ON INTERNET GAMING DISORDER AMONG
EMERGING ADULT MULTIPLAYER ONLINE BATTLE ARENA (MOBA) PLAYERS
IN MALAYSIA

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Examine the Associations between Self-Efficacy, Peer Influence, and Impulsivity on
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Players in Malaysia

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DECLARATION

We declare that the material contained in this paper is the end result of our own work and that due acknowledgment has been given in the bibliography and references to ALL sources be they printed, electronic or personal.

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APPROVAL FORM

This research paper attached here, entitled "Examine the Associations between Self-Efficacy, Peer Influence, and Impulsivity on Internet Gaming Disorder Among Emerging Adult Multiplayer Online Battle Arena Players in Malaysia." prepared and submitted by "Chan Zi Yuan, Lim Wen Yan, and Tan Yun Lin" in partial fulfilment of the requirements for the Bachelor of Social Science (Hons) Psychology is hereby accepted.

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Abstract

Online gaming has grown to be a significant source of digital leisure, while youths are becoming increasingly concerned about Internet Gaming Disorder (IGD). Among the several game genres, youths are increasingly drawn to Multiplayer Online Battle Arena (MOBA) games like League of Legends, Dota 2, and Honors of King. Through the lens of Social Cognitive Theory (SCT), the purpose of the current study is to examine the association of self-efficacy, impulsivity, and peer influence on Internet gaming disorder (IGD) among MOBA players emerging adults in Malaysia. A non-probability purposive sampling method was utilized to collect 178 emerging adults MOBA players in Malaysia. Internet Gaming Disorder Scale 9-Short-Form, New General Self-Efficacy Scale, Impulsive Behaviour Short Scale-8 and Peer Influence for Internet Gaming Addiction Scale were utilised to measure the variables in the present study. The result demonstrated that self-efficacy significantly predicted IGD, while impulsivity and peer influence played as significant negative predictors of IGD. In summary, the current findings have provided a knowledge of the correlated factors of IGD among MOBA players emerging adults in Malaysia. This is helpful in identifying gaps in the literature concerning early intervention, prevention, treatment, and pathological issues related to gaming in the education sector in Malaysia.

Keywords: Internet gaming disorder (IGD), Self-efficacy, Impulsivity, Peer influence, Emerging adults, Malaysia

Subject area = BF1-990 Psychology

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List of Abbreviations

Abbreviation

DSM-5	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
DSM-5-TR	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision
H	Hypothesis
I-8	Impulsive Behavior Short Scale–8
IGD	Internet Gaming Disorder
IGDS9-SF	Internet Gaming Disorder Scale–Short Form
K-S test	Kolmogorov-Smirnov Test
Q-Q plot	Quantile-Quantile Plot
MLBB	Mobile Legends: Bang Bang
MLR	Multiple Linear Regression
MMORPG	Massively Multiplayer Online Role-Playing Game
MOBA	Multiplayer Online Battle Arena
NGSES	New General Self-Efficacy Scale
RPI	Risk Appetite Index
RTS	Real-Time Strategy
SCT	Social Cognitive Theory
SPSS	Statistical Package for Social Science
SERC	Scientific and Ethical Review Committee
UTAR	Universiti Tunku Abdul Rahman
VIF	Variance Inflation Factor

Chapter I

Introduction

Background of Study

Online gaming has become a major form of digital entertainment after rapidly expanding throughout the world in recent years (Karun Sanjaya et al., 2023). Among the various game genres, Multiplayer Online Battle Arena (MOBA) games such as League of Legends, Dota 2, Honors of King have become increasingly popular among youth. The reasons are due to MOBA games containing elements of cooperative and competitive systems, social interaction features and real-time strategy (RTS). According T'ng et al. (2022), mobile gaming has now become the main digital leisure activities in Southeast Asia, including Malaysia, which has been viewed as one of the world's fastest-growing mobile game markets.

Concerns regarding Internet Gaming Disorder (IGD) have increased with the global rise of online gaming. Internet gaming disorder is characterised by the pattern of persistent and repeated online gaming which involves interaction with other players that result in a significant impairment or distress (American Psychiatric Association, 2013). The prevalence of IGD has significantly increased in recent years although it remains under “conditions for further study” in the DSM-5 and DSM-5-TR (Zhu et al., 2023). In Malaysia, there are excessive gaming hours and addictive symptoms such as loss of control and compulsive gaming are reported among youth. The increasing popularity of mobile and MOBA-based esports has raised public health concerns regarding problematic gaming patterns among youth (Chen et al., 2025). For instance, excessive gaming has been associated with sleep disturbance, emotional dysregulation, and increased stress (Chamarro et al., 2024; Riaz et al., 2025).

MOBA players are viewed as a high-risk group for IGD due to the unique structural and psychological features of the game genre. MOBA games rely on ranking systems that motivate players to continuously improve their skills to achieve high rank (Han, 2025). The ranking system in MOBA games serves as representation of players' strength, in which a higher rank indicates stronger player. Players who are keen to compete for titles and compare rankings are highly motivated to spend more time on MOBA games, leading to compulsive behavior (Xia et al., 2024). In addition, the team-based structure of MOBA gameplay can lead to heightened aggressive responses and compulsive gaming tendencies (Chen et al., 2025). Finally, the easy accessibility of mobile MOBA platforms enables continuous opportunities for engagement, making it easier for gaming habits (Syvertsen et al., 2022).

Emerging adulthood refers to an age range between 18 and 29 years old, which is a developmental phase that spans from late adolescence to adulthood (Kuang et al., 2023). Emerging adults are vulnerable to problematic gaming due to heightened stress exposure, increased autonomy, and easy access to digital devices (Vasiliu, 2022). Yen et al. (2017) further reported that emerging adults, especially young adult male view gaming as an emotional escape mechanism when facing stress in the real-life which increases the risk of IGD. Video games negatively impact the cognitive functioning and mental health across different life aspects among emerging adults. These findings highlight emerging adults are susceptible to problematic gaming behaviours due to their developmental vulnerabilities and situational stressors, leading emerging adults as a high-risk group for IGD.

It is essential to know the predicting factors of IGD. One of the key factors refers to self-efficacy, which is defined as individuals' self-belief in their ability and competence to achieve desired goals. According to Zhang et al. (2022), players with

higher self-efficacy are reported to have better emotional regulation and healthier gaming habits, while individuals with low levels of self-efficacy face difficulties setting boundaries and difficult to suppress the urge to game compulsively, leading to a high tendency of problematic gaming.

The next predictor is peer influence, which refers to insistence and encouragement of individuals in the same age group to make individuals do something (Yu et al., 2021). Research by Li et al. (2025) states that IGD is associated with negative peer experience such as social exclusion and peer rejection. Furthermore, peer pressure to participate in gaming sessions and even night-time playing are positively correlated to IGD, particularly for those who lack social skills as they are hard to resist peer influence (Donthu et al., 2023). Additionally, positive social reinforcement such as praise or recognition for in-game achievement encourages people to play video games for longer periods of time (Phillips et al., 2018).

Another predictor of IGD is impulsivity. Impulsivity refers to reactive, intuitive, and affective processes with high responsiveness to temptations and prompt actions without deliberation (Yu et al., 2021). Individuals with high levels of impulsivity are easily diagnosed with IGD as they tend to seek immediate gratification without thinking of the potential consequences, especially in the environment of MOBA games which offer immediate rewards that reinforce the compulsive behaviour. For instance, Zhu et al. (2023) stated that participants with high impulsivity scores showed greater IGD symptoms, with the mediation of risk appetite index (RPI). Chen et al. (2025) further stated that in Malaysia, youth with higher levels of impulsivity are easily involved in game addiction, especially male. Furthermore, study by Zha et al. (2022) also supports these findings, showing that individuals with IGD display impaired impulse control compared to gamers without the disorder.

Social Cognitive Theory (SCT) by Bandura (1997) are adopted in the present study to provide understanding regarding the impact of self-efficacy, peer influence, and impulsivity on IGD. SCT emphasizes how the interactions among personal factors, environmental factors, and behaviours shape individuals learned and behave. Within this framework, self-efficacy and impulsivity are viewed as personal factors that influence how individuals react to external stimuli. Meanwhile, peer influence is viewed as an environmental factor to reinforce or discourage certain behaviours. These interactions shape behavioural outcomes, which refers to IGD.

It is essential to understand how the interaction of self-efficacy, impulsivity, and peer influence predicts IGD. This helps to improve prevention strategies and promote healthy gaming habits among young adults. Through the lens of SCT, the present study aims to provide a clear picture regarding personal and environmental predictors of IGD among emerging adult MOBA players in Malaysia.

Problem Statement

IGD has recently become a topic of concern among the community of individuals worldwide, especially among the youth. Online gaming is very widespread among Malaysians aged between 16 and 24 where 88% of the population reported online gaming (Statista, 2025). Mobile Legends: Bang Bang (MLBB) has been reported to be the most downloaded free MOBA game worldwide, with more than 8.3 million combined downloads across different platforms such as Google Play and Apple App Store (Statista, 2025). Malaysia has been found as a major contributor to MLBB's player base with over 10 million active players monthly (Fauzan, 2023). Local research investigated the IGD in adolescents and general gaming audiences (Mohamed et al., 2023; Nordin et al., 2025). With the active growth in the number of MOBA players in Malaysia, especially among the emerging adults, it is urgent to explore this group in more detail in a bid to determine

the collaborative influence of the stage of development and the gaming environment on the risk of developing IGD.

MOBA games are marked by long-term matches, high competition, and long-term pressure on playing performance, which were all empirically connected to the high risk of IGD (Aggarwal et al., 2019; Khor et al., 2019; T'ng et al., 2022; T'ng & Pau, 2020). This is supported by Malaysian empirical studies. In two studies that included over 1,500 MOBA subjects, frustration, gaming motivations, achievement orientation, immersion, and identification with in-game avatars were identified as predictive variables of IGD, and one study explained as much as 45 per cent of individual IGD scores (T'ng et al., 2022; T'ng & Pau, 2020). Still, despite the strong evidence of increased vulnerability, the structural and psychological peculiarities of the MOBA genre are not yet sufficiently investigated in the Malaysian context.

Although the existing volume of global studies on the IGD has grown particularly in its studies, research studies within the context of Malaysia have mainly focused on adolescent groups or collected youth samples, and little has been done on the newly recognised population group of emerging adults aged from 18 to 29 years old. For instance, psychosocial correlates of IGD in a nationally representative survey of Malaysian secondary-school students, but intentionally omitting older age groups (Mohamed et al., 2023). Similarly, literature that includes young adults often generalises them with adolescents or does not consider emerging adulthood as a specific stage of development (Gao et al., 2025).

Conversely, global meta-analysis synthesis proves that IGD is still a burning issue among young adults, which underlines the necessity to strip down the mechanisms of the risk manifestation in terms of developmental levels (Gisbert-Pérez et al., 2024).

Therefore, it is quite clear that a study with a distinct focus on the age-specific patterns of

IGD among Malaysian emerging adults is lacking conspicuously, and this gap will be addressed in this study.

Although most studies on the IGD have focused on the Massively Multiplayer Online Role-Playing Games (MMORPGs), the increasing evidence proves that the MOBA genre is a subject of specialized interest. One of the studies on a big population of adolescents, such as that one, reported that high IGD was correlated with MOBA game engagement, odds ratio being 1.51 with confounding factors controlled (Han et al., 2020). This is important since MOBA games usually have a team-based play, are fast-paced and short-session, and with severe social backlash. These contextual forces provide the circumstances in which cognitive and social variables can have more definitive impact on gaming behaviour: e.g., self-efficacy, peer influence, and impulsiveness.

Research on MOBA players in Malaysia has shown that the frustration of the psychological needs is an important predictor of the risk of IGD, and the motivations of social affiliation, escape, competition, coping, and skill development mediate this interaction (T'ng et al., 2022). Nevertheless, regardless of these results, most Malaysian studies remain publication-based on adolescents or general audiences of gamers, and the genre-specific mechanisms of MOBA addiction remain insufficiently investigated (Mohamed et al., 2023; Nordin et al., 2025).

The theoretical frameworks most frequently applied to IGD include Self-Determination Theory (Deci & Ryan, 2000), Problem Behaviour Theory (Labouvie, 1978), and other theories, the complicated interaction of individual, behavioural and environmental factors that characterise IGD is often somewhat overlooked, despite the accumulating body of research on the topic (Meng et al., 2024; Mills & Allen, 2019 ; T'ng et al., 2022; Zhuang et al., 2023). These models are prone to concentrate on either intrapersonal aspect such as self-control or external support but hardly are they combined

with the dynamic back and forth forces that are core to the gaming experience. Being especially effective in explaining IGD in MOBA players, SCT is still under-represented in the literature, as it mainly revolves around dynamic interactions of individual dispositions, behaviours, and social environments (T'ng et al., 2022; Li et al., 2023). The inclusion of SCT may offer a better and ecologically valid explanation of IGD, particularly when it concerns highly interactive and socially motivated games (T'ng et al., 2022; Li et al., 2023).

All in all, the literature has gaps, including low representation of Malaysian MOBA players, the lack of disaggregation of the elements of impulsivity, the lack of formulation of relationships between impulsivity and self-efficacy and peer influence, the lack of the usage of SCT, the lack of the culturally based research, and cross-sectional designs. Such gaps are to be correspondingly filled in to be able to clarify the mechanisms of how IGD evolves within MOBA environments, and devise more efficient preventative programmes that will consider both individual and social contextual developmental factors.

Research Questions

1. Does self-efficacy negatively predict Internet gaming disorder among multiplayer online battle arena players in Malaysia?
2. Do impulsivity and peer influence positively predict Internet gaming disorder among multiplayer online battle arena players in Malaysia?

Research Objectives

1. To examine the predictive roles of self-efficacy, impulsivity, and peer influence on Internet gaming disorder among emerging adult multiplayer online battle arena players in Malaysia.

Research Hypothesis

H₁: Self-efficacy negatively predicts Internet gaming disorder among emerging adult multiplayer online battle arena players in Malaysia.

H₂: Impulsivity positively predicts Internet gaming disorder among emerging adult multiplayer online battle arena players in Malaysia.

H₃: Peer influence positively predicts Internet gaming disorder among emerging adult multiplayer online battle arena players in Malaysia.

Significance of Study

Theoretical Contribution

In the present study, SCT is applied to understand IGD among MOBA players which can deepen theoretical insight into how gaming addiction can develop in the context of competitive and social online games. SCT theorizes that behaviour is shaped through the reciprocal interplay between the factors of cognitive, behaviour and environmental (Bandura, 1986). The present study can enhance theoretical understanding of IGD beyond the previous models that have examined the variables separately by considering self-efficacy, peer influence and impulsiveness within a single SCT framework.

Furthermore, the present study can increase SCT's ability to give explanations on digital addictive behaviours and can offer a clearer understanding of how the social, personal and trait-related factors can be linked to gaming addiction by looking at the factors together. This can help fill in the gaps in past research which often looked at these factors separately instead of interacting influences. It can also aid in providing a valuable contribution to any future research in the research topics of IGD.

Practical Contribution

The present study provides insights into factors that may lead to IGD among emerging adult MOBA players in Malaysia, revealing that self-efficacy, peer influence, and impulsivity are significant predictors of IGD. The findings provide essential implications for mental health professionals, educators and university administrators, and the gaming community.

Firstly, the findings benefit mental health professionals such as psychologists, counselors, and clinical practitioners. Mental health practitioners are able to design evidence-based assessment tools and targeted interventions by identifying self-efficacy, peer influence, and impulsivity as predictors of IGD. For example, psychologists can implement cognitive-behavioral strategies to strengthen self-efficacy by setting achievable gaming limits and developing self-regulation skills. Impulsivity-targeted programs, such as mindfulness training or delay-of-gratification exercises, can help emerging adults resist compulsive gaming urges. Moreover, the psychoeducation about the impact of peer pressure in online gaming in communities has equipped individuals with coping strategies to reduce the social influences that encourage excessive play. These approaches can help improve the clinical outcomes by addressing the combination of personal and the social risk factors in this population.

In addition, the findings can help educators and university administrators in the designing of campus-based programs that can directly support the emerging adults to decrease the risk of IGD. For example, the findings can be combined into awareness campaigns or workshops on the healthy habits of gaming which can make them have more impact for the students that are emerging as adults. Academic staff can use the knowledge to identify students who perhaps might be at risk of IGD and provide early guidance or referrals to services such as counselling. Also, the educational programs can

focus on the promotion of self-regulation, time management and coping skills which can be essential for students to balance their academic responsibility with gaming as a leisure activity.

Lastly, in the gaming community which includes the peers, fellow players and team leaders can be an influence to encourage a more healthier gaming experience. Team leaders and peers can help encourage more positive behaviour, decrease excessive gaming and mutual support with the gaming community by having awareness of the psychological vulnerabilities such as low self-efficacy or impulsivity. Gamers can gain insight into their own behaviour and implement strategies that can help manage their gaming time, manage the intense competitive pressure and have a balance between social and academic. The study provides a framework for reducing the risk of IGD while promoting a healthier gaming culture among the emerging MOBA adult players by targeting both the social and personal influences.

Conceptual Definitions

Internet gaming disorder (IGD)

According to the American Psychiatric Association (2013), Internet gaming disorder refers to the pattern of persistent and repeated online gaming which involves the interaction with other players that result in a significant impairment or distress. Internet gaming disorder is included in Section 3 in the latest 5th edition of the Diagnostic and Statistical Manual of Mental Disorder, Text Revision (DSM-5-TR).

IGD is diagnosed when the individual meets five or more of the nine criteria: (a) having persistent thoughts about gaming, (b) having discomfort or irritability when not able to game, (c) the need to play for long hours to achieve the same satisfaction, (d) having repeated and unsuccessful efforts to stop or reduce gaming, (e) the loss of interest in past hobbies or activities aside from gaming, (f) continue to excessively play despite

knowing that it causes problems, (g) lying to members of the family or others about the extent of gaming, (h) to manage or escape the negative emotions using games, and (i) losing or risking important task, relationships or academic due to gaming (Şalvarli & Griffiths, 2019).

Self-efficacy

Self-efficacy is defined as the belief in one's ability or the competence to perform a goal successfully or to influence an outcome (Farmer et al., 2019). Self-efficacy develops as an individual gradually builds complex cognitive, social, and physical abilities through their experience (Gist, 1987). It operates as a layered and multidimensional system of beliefs that can shape how an individual feels, thinks, acts when carrying out several tasks and staying motivated (Tsang et al., 2012).

Peer influence

Peer influence refers to where one individual affect or is affected by another individual or many others who are in the same age (Laursen & Veenstra, 2021). Peer influence happens when an individual changes or maintains an attitude, behaviour partly due to the real or anticipated reaction of the peers (Brown & Anistranski Jr, 2020).

Impulsivity

Impulsivity is an important personality trait that is marked by a tendency to act spontaneously and quickly, without any restraint when making decisions or taking actions even if it may lead to negative outcomes (Zhu et al., 2023). Impulsivity is linked with depression and can indirectly cause loneliness, and interpersonal relationships may be ruined (Şalvarli & Griffiths, 2019).

Operational Definitions

Internet gaming disorder (IGD)

Pontes and Griffiths (2015) develop the Internet Gaming Disorder Scale–Short-Form also known as IGDS9-SF. The scale has 9-items which assess the severity of gaming-related symptoms over the past 12 months. Each item is corresponding to one of the nine criteria for IGD in the DSM-5. It is rated on a 5-point Likert scale which ranges from 1 (*never*) to 5 (*very often*). The higher total score indicates a greater degree to which the respondents show IGD symptoms.

Self-efficacy

The New General Self-Efficacy Scale also known as NGSE was developed by Chen et al. (2001) to measure the overall belief of an individual in their capability to handle a variety of challenging situations. The scale consists of 8 items, and each item is rated on a 5-point Likert scale which ranges from 1 (*strongly disagree*) to 5 (*strongly agree*). A higher score would indicate that the respondent has greater self-efficacy which can reflect a stronger confidence in an individual's ability to successfully manage the difficult tasks.

Peer influence

Wu et al. (2016) developed the Peer Influence for Internet Gaming Addiction scale to measure the positive peer influence which includes perceived positive attitudes of peers and best friends toward use of the internet, how often peers and best friends use the internet and the frequency to invite peers and best friends to use the internet. The scale consists of 6 items. Items 1 and 2 are rated on a 4-point Likert scale which ranges from 1 (*totally against*) to 4 (*totally approves*). Items 3 to 6 are rated on a 4-point Likert scale which ranges from 1 (*never*) to 4 (*all the time*). The higher scores would indicate that there is stronger peer approval, more frequent internet use by peers and best friends and

more frequent invites from peers and best friends to engage in internet activities.

Impulsivity

The Impulsive Behaviour Short Scale–8 (I-8) was developed by Groskurth et al. (2022) to measure the impulsivity across four subdimensions. Items 1 and 2 is to measure the urgency, items 3 and 4 is to assess the lack of premeditation, items 5 and 6 is to measure the lack of perseverance and items 7 and 8 is to capture the sensation seeking. All items are rated on a 5-point Likert scale from 1 (*does not apply to all*) to 5 (*applies completely*). Items 3, 4, 5 and 6 are reverse coded to accurately represent the lack of premeditation and perseverance. The higher the total scores would indicate there is a higher level of impulsive behaviour.

Chapter II

Literature Review

Conceptualizing on Internet Gaming Disorder

According to American Psychiatric Association (2013), IGD was added to the DSM-5 which is defined as having patterns of persistent and repeated online gaming that involves interactions with other gamers that can result in significant impairments or distress over a 12-month period. IGD is diagnosed when an individual meets 5 or more of the nine criteria. The first criterion is that the individual would have experienced persistent thoughts about gaming which has become a dominant mental preoccupation that can interfere with the daily tasks, work or relationships. The second criterion is that the individual will display discomfort, irritability or restlessness when unable to play games which indicate withdrawal symptoms. The third criterion is the need to play for a long period of time to achieve the same level of excitement or satisfaction which would indicate tolerance and escalating engagement.

The fourth criterion involves repeated but unsuccessful attempts to control or stop gaming which demonstrates the impaired of self-regulation despite intentions to change the behavior. The fifth criterion is that the individual may experience loss of interest in activities or hobbies, which gaming has become the main source of enjoyment. The sixth criterion is that the individual being fully aware of the dangers in gaming such as a decline in academic performance, relationship conflicts or sleeping patterns are disrupted but continues to engage in it.

Moreover, the seventh criterion is the individual would deceive members of the family or other individuals about the time that is spent playing games which is to avoid being criticized or restricted. The eighth criterion is the use of gaming to escape or cope from negative emotions

such as anxiety, stress or frustration. The ninth criterion is the risk of losing important tasks, responsibilities and relationships due to internet gaming such as work performance, academic achievements and personal relationships (American Psychiatric Association, 2013).

Conceptualizing on Self-efficacy

Self-efficacy is defined as the belief in one's ability or the competence to perform a goal successfully or to influence an outcome (Thiel & Marx, 2019). It serves as a sense of personal competence that affects how people consider, perceive, and behave in life. Individuals with high general self-efficacy tend to believe they can manage challenges, set attainable goals and face difficulties with confidence (Gale et al., 2021). While individuals with low general self-efficacy struggle to maintain self-control and tend to use avoidance coping strategies when faced with challenges (Gale et al., 2021). With this concept, self-efficacy often used in several studies related to addictions such as problematic eating behaviours, alcohol-related behaviours, and smoking behaviours (Aynehchi et al., 2023; Linares et al., 2025; Rajani et al., 2020).

Through the lens of SCT (Bandura, 1977), self-efficacy can result in both desirable and negative outcomes. Although self-efficacy is commonly viewed as a positive mechanism to manage maladaptive behaviours and enhance motivation, its effects are not always optimistic (Vancouver, 2006). For instance, Beck and Schmidt (2015) stated that high-self efficacy people feel confident that they can succeed with less effort, thus reducing resource allocation (e.g., effort and time spent on the tasks), leading to low performance. Vancouver et al. (2014) further claimed that individuals with extremely high self-efficacy can lead to overconfidence and unwillingness to seek feedback from others. As a result, there is a potential tendency of self-blame and refusal to seek assistance from others due to complacency undermining the goals. In the context of gaming, higher online social self-efficacy, which refers to the beliefs in one's ability to

stay connected with others online is positively correlated with gaming addiction (Jeong & Kim, 2011).

The relationship between self-efficacy and social support is considered as another important aspect. Individuals with high self-efficacy tend to engage in positive coping strategies such as seeking social support dealing with difficulties (Sun et al., 2025). The reason is due to high self-efficacy individuals consider challenges as opportunities to grow instead of threats (Sun et al., 2025). Yin et al. (2022) provided additional evidence that self-efficacy acted as a mediator between psychological well-being and social support. Self-efficacy was positively impacted by social support, and this increased self-efficacy encouraged people to use constructive coping mechanisms like reaching out for social support (Yin et al., 2022). According to Chen et al. (2025), social support increases self-efficacy by providing behavioral and emotional support. On the other hand, individuals who have low self-efficacy are less likely to seek out social support because they believe they are incapable of managing social situations. Therefore, self-efficacy is connected to both external environments and internal psychological mechanisms.

Conceptualizing on Peer Influence

Peer influence can be defined as a process through which an individual's attitudes and behaviors are shaped by the norms, actions and expectations of the peer group (Brechwald & Prinstein, 2011). Peer influence works through many social mechanisms which include copying and observing the behaviours of peers, comparing to other individuals and seeking validation within the peer group (Bandura, 1977).

Peer influence gains a significant power as the individual would increasingly depend on peers for emotional support and the formation of their identity during adolescence and young adulthood which are the developmental period where social belonging becomes important to the individual (Steinberg & Monahan, 2007).

Peer influence can be exerted directly through encouragement, persuasion or pressure to act in a certain behavior (Farrell et al., 2016) or indirectly through the observation of the behaviour of peers by watching the actions of the peers which suggest what behaviours are valued or accepted within the peer group (Venticinque et al., 2021). Also, peer groups create standards that shape how the behaviour is seen as appropriate, accepted or unsafe within the group which makes the individual to adapt to these behaviours to associate or maintain the harmony with the group (Laursen & Veenstra, 2021).

Conceptualizing on Impulsivity

Impulsivity is conceptualized as a multidimensional personality and behavioural construct characterized by a tendency to act spontaneously and quickly, without any restraint when making decisions or taking actions even if it may lead to negative outcomes (Zhu et al., 2023). It involves difficulty delaying gratification, heightened preference to immediate rewards, and link to maladaptive behaviour (Lewin et al., 2023). Classical models describe impulsiveness as involving deficits in inhibitory control, weak planning, and a preference for short-term over long-term outcomes (Evenden, 1999). A recent study stated impulsivity as a broader trait which emphasizes cognitive, emotional, and behavioural components that jointly increase the likelihood of premature actions, especially under conditions of heightened emotional arousal or reward cues (Mungo et al., 2025).

File et al. (2022) highlighted the link between impulsivity and reward expectancy. Impulsivity influences how individuals perceive and respond to rewards. Specifically, people with high impulsivity tend to exhibit high reward sensitivity, thus reducing the ability of delaying gratification and showing stronger approach tendencies (File et al., 2022). These patterns suggest that impulsive individuals tend to choose immediate

satisfaction over long-term consequences because there is an imbalance between reward-driven motivation and self-regulatory capacity. Thus, impulsivity is conceptualised as a multidimensional trait that shapes how individuals evaluate risks, process rewards, and regulate their behavioural responses across everyday contexts (File et al., 2022).

Self-Efficacy and Internet Gaming Disorder

Self-efficacy is essential to predict IGD as it decides individuals' belief or engagement in Internet gaming. Yang (2020) reported that there was a significant negative correlation between self-efficacy and internet addiction. Chung et al. (2020) described that there was a tendency in gaming addicts to have lower general self-efficacy in various age groups. Prior studies among adolescents have further confirmed that lower self-efficacy is significantly negatively correlated with IGD (Berte et al., 2019; Chung et al., 2020).

Individuals with low self-efficacy face difficulty setting boundaries and suppressing gaming urges, thus leading to vulnerability to IGD. Lower self-efficacy individuals tend to spend more time playing games, suggesting that self-efficacy serves as a protector factor or a risk of excessive gaming (Chung et al., 2020). (Wu et al., 2022) further reported that high self-efficacy has indirectly reduced IGD symptoms among youth as it has correlated to emotional coping. Further supported study by Zhang et al. (2022) which stated that gamers with low social self-efficacy tend to become dependent on online gaming. They view online gaming as a means of compensation as they feel less confident in real-world social skills.

On the other hand, self-efficacy positively predicts IGD in certain contexts. Gaming self-efficacy refers to individuals' belief in the capability to perform gaming-related tasks (Jeong & Kim, 2011). Mills et al. (2019) described that individuals with high gaming self-efficacy have high confidence in the gaming skills, driving them to engage in excessive playing to fulfill the sense of competence. Keskinkilic et al. (2024) stated that gaming self-efficacy positively predicts gaming disorder severity, indicating that gamers

who believe that they are skilled are more likely to become addicted to excessive playing. Moreover, social self-efficacy in the virtual world indicates positive correlation between gaming addiction (Jeong & Kim, 2011). Online social self-efficacy refers to individuals' belief of the capability to stay meaningfully connected to the virtual world (Jeong & Kim, 2011). This serves as predictors of IGD due to individuals who feel highly effective, successful, and competent in online social interactions rely on the virtual environment to meet their social needs, which leads to increased time spent and greater risk of addiction.

Peer Influence and Internet Gaming Disorder

Peer influence tends to work through the social norms and the behavior of peers when believing that the peers' gaming frequently is a norm which the individual would be more likely to adopt to that behavior. A past study by Angelini et al. (2024) showed that individuals who see that their friends often play games and view heavy gaming as normal tend to play more themselves, which can increase the likelihood of developing IGD.

Moreover, the social context and peer influence can interact with personal vulnerabilities such as stress, boredom, loneliness, to further increase the risk of IGD. A study by Nordin et al. (2025) found that loneliness and boredom have a significant association with the IGD symptoms among Malaysian young adults. IGD can be seen as an outcome. IGD can be seen as a multifaceted link between personal vulnerabilities, peer and social environment, and the individual's motivation to use gaming as a coping mechanism.

Social processes within peer groups involve both "selection" which is where the individual chooses peers that play games and "influence" which is the individual who would adopt their peers gaming patterns (Li et al., 2024). A study by Li et al. (2024) discovered that individuals tend to pick their peers who also play games and those peers

will influence them to play even more which creates a cycle where gamers will choose gaming friends, and those friends encourage more gaming which can increase the risk of IGD.

Peer relationships which include acceptance, rejection and affiliation are important in the social influencing the development of IGD. Li et al. (2025) found that the individuals that experience peer rejection are more likely to develop IGD and this correlation through the increased feeling of relative deprivation which acts as a mediating factor. Individuals that are rejected by their peers would seek other alternative sources of social connection by online gaming which provides a more accessible option when peer relationships in real life are not satisfying (Koay & Abdullah, 2024). According to Yu et al. (2025), the feelings of loneliness or being disconnected from peers are seen as a significant predictor of IGD among the individual that has low self-control which suggest that peer alienation with individual vulnerabilities can increase the risk of IGD.

Impulsivity and Internet Gaming Disorder

Impulsivity has been identified as a significant predictor of IGD. Luiz et al. (2024) described that impulsivity positively predicts problematic gaming behaviours, such as compulsive gaming and excessive playing. Impulsive individuals are easily affected by immediate rewards that are presented in online games, as they often behave immediately without considering consequences. Şalvarli and Griffiths (2019) stated that impulsivity predicted IGD symptoms among young adults, suggesting that impulsivity reduces an individual's ability to control the gaming frequency and duration. Furthermore, a study by Wang et al. (2022) further supported that impulsivity positively contributed to problematic gaming, highlighting the significance relationship between impulsivity and IGD.

One mechanism that links impulsivity with IGD refers to difficulties with inhibitory control. Online games, especially MOBA games which require players to involve themselves in quick decisions, frequent risk-taking, and unstoppable responsiveness to stimuli reinforce players' impulsive tendencies. Wegmann et al. (2020) stated that individuals with high impulsivity show impaired executive control, including weaker ability to inhibit urges and delay gratification. As a result, although individuals with high impulsivity are aware of negative consequences of excessive gaming such as sleep disturbance and interpersonal strain, it is hard to quit from compulsive gaming. Chung et al. (2020) further reported that impulsive individuals can't persistently resist gaming urges, making them more vulnerable to compulsive engagement.

T'ng et al. (2025) explained that impulsive players who struggle with behavioural control exhibit heightened sensitivity to rewarding stimuli. Online games' mechanisms such as time-limited reward system, ranking system, and in-game achievements further provide positive gratifications toward players (Raybould & Tunney, 2024). As a result, players are led to excessive gaming and vulnerable to IGD due to players' reward-seeking behaviours have been reinforced (T'ng et al., 2025). These individuals pursue gaming as a quick source of emotional relief, making them more likely to develop addictive behavior. Hence, impulsivity increases the risk of transitioning from entertaining activity to problematic behaviour, particularly when combined with the mechanisms in MOBA games.

Theoretical Framework

SCT provides an all-inclusive and dynamically changing predictor of the psychological and social processes underlying IGD among the group of emerging adults MOBA players. It states that human behaviour is products of an on-going, two-way interaction between personal cognitions, behaviour patterns and environmental forces an

interaction that Bandura (1986) and later Linares et al. (2025) and Schunk and DiBenedetto (2019) termed triadic reciprocal determinism. This theoretical orientation predicts human agency, people are active agents with the ability of self-reflection, self-control, and choice of action, which are particularly relevant in the context of online gaming, where personal characteristics, social relationships, and behavioural patterns become closely coupled and supportive of each other.

Personal Factors: Self-Efficacy and Impulsivity

The most important construct in the SCT is self-efficacy construct which refers to the belief of a person in his ability to perform the necessary behaviours that can enable him to achieve the desired outcomes (Bandura, 1986). High self-efficacy does not only enhance motivation but promotes adaptive coping, as well as makes it more resilient to maladaptive behavior (Liu et al., 2025; Zhang et al., 2022). Regardless of the situation in digital gaming, players with stronger self-efficacy have a better capacity to regulate their engagement rates, show resistance to social pressure, and less prone to developing pathological playing patterns, whereas players with weaker self-efficacy seem more susceptible to development of IGD (Ouyang et al., 2023). This finding is supported by empirical studies, which reported an inverse correlation between self-efficacy and IGD risk in the group of Chinese undergraduates (Liu et al., 2025; Zhang et al., 2022).

A personal determinant such as impulsivity summarises the lack of behavioural regulation that destabilises the control of immediate impulses (Şalvarlı & Griffiths, 2019). In the SCT framework, impulsivity is involved in interplay with self-efficacy and environmental salient cues to control behaviour. The elevated degree of impulsiveness undermines the self-regulatory processes, increases vulnerability to short-term rewards and reduced the ability to endure long gaming, especially within the fast-paced, socially

oriented MOBA (Fumero et al., 2020; Islam et al., 2023; Ropovik et al., 2022). The results are consistent, which contributes to inter-relations between heightened impulsivity and IGD severity, as well as to synergistic relationships between peer influence and self-efficacy, emphasising the fact that the four variables collectively shape the results of gaming (Yu et al., 2021).

Environmental Factors: Peer Influence

SCT highlights the importance of observational learning, modeling, and vicarious reinforcement (Bandura, 1986; Linares et al., 2025). The influence of peers is identified as a decisive factor of the environmental determinant of gaming behavior. In MOBA communities, which are characterised by teamwork and social interactions as a fundamental part, players often see others or players at a higher rank, which then adopt similar types of behaviour and internalise social norms that can make excessive gaming possible (Ouyang et al., 2023; Schurz et al., 2020). The gaming commitment can be enhanced by positive outcome expectations based on these peers such as social validation, achievements or stress reduction. Furthermore, the social comparison mechanisms that take the form of leaderboards or achievement badges can be used to initiate protracted play as a way of maintaining or improving the social status (Esteves et al., 2021; Linares et al., 2025; Liu et al., 2025). Due to the empirical findings, peer influence is a strong predictor of the severity of IGD, particularly in adolescent and young adults (Yu et al., 2021).

Behavioral Processes: Self-Regulation and Motivation

SCT presents the behavioural processes that include self-regulation and motivation as mediators that connect the personal and environmental variables. Self-regulation involves the methodical check, re-examination and repositioning of behavior to achieve set objectives (Islam et al., 2023). People with greater self-efficacy and lesser impulsive tendencies have excellent self-regulation, thus reducing the risk of IGD (Liu

et al., 2025; Ouyang et al., 2023). The presence of motivational drives and their expectations of orient goal-oriented actions, positive expectations, e.g., social rewards or personal achievement, support playing games, and negative ones might be inadequate to discourage excessive play when there is no strong self-control (Linares et al., 2025; Schunk & DiBenedetto, 2019).

Integration and Empirical Support

Integrating these constructs, SCT provides a unifying framework for understanding IGD. Self-efficacy, impulsivity, and peer influence interact reciprocally. There are reciprocal interactions between self-efficacy, impulsivity and peer influence. Peer dynamics has a higher chance of influencing individuals with impulsive behaviour and low self-efficacy, which, consequently, leads to maladaptive gaming, creating a feedback loop of self-reinforcement, and perpetuates IGD behaviours (Şalvarlı & Griffiths, 2019; Yu et al., 2021). Problematic technology use mitigation by interventions that rely on SCT, including improvements in self-efficacy and self-regulation, have been empirically validated and, therefore, can be considered a testament to the framework applicability (Islam et al., 2023; Ouyang et al., 2023; Scott et al., 2024).

SCT's strength lies in its integration of personal, environmental, and behavioral factors, allowing researchers to account for the complex interactions driving IGD. The model also supports the presence of ancillary constructs, such as motivation, affective engagement, and cognitive control, which provides a versatile, empirically grounded apparatus to explore MOBA players.

Summary

SCT by Bandura provides a strict and multidimensional model to question self-efficacy, peer pressure and impulsivity as predisposing factors to IGD in MOBA participants.

Emphasising mutual relations between personal qualities, social environment, and behavioural styles, SCT provides a persuasive explanation of explaining the IGD mechanisms and designating the way the specific intervention and prevention measures should be developed.

Conceptual Framework

This conceptual framework that is based on the SCT states that self-efficacy, peer influence, and impulsivity are the most influential predictors of IGD in MOBA players in Malaysia. Empirical evidence lends solid support to hypothesized relationships, and the model has a strong basis upon which researchers can study the psychological and social processes involving IGD.

One of the theoretical models that are useful in explaining the development of IGD in MOBA players is SCT by Bandura (1986). The theory has been instrumental in highlighting the triadic reciprocal determinism model where individual thought, behavioral tendencies and environmental conditions are regarded as mutually dependent (Bandura, 1986). The main principle of this model is self-efficacy construct, which is a vital personal component that summarizes the faith of a person to control behaviors and achieve the desired results (Bandura, 1997).

The empirical findings show that high self-efficacy levels provide better control over the behaviour of gaming, thus reducing the risk of IGD, but undermined self-efficacy can intensify the risk of maladaptive behaviour, such as excessive gaming (Kuss & Griffiths, 2011; Zhang et al., 2022). In line with that, self-efficacy is expected to have a negative relationship with IGD, since people with better beliefs in their self-efficacy are less vulnerable to problematic gaming. Empirical data can support this hypothesis by showing that there is a negative correlation between IGD risk and self-control, self-efficacy (Yu et al., 2021).

Peer influence is predicted with a positive relationship with IGD, as peer norms and reinforcement may socialize or promote excessive gaming, which predisposes a person to the development of the disorder (Gao et al., 2025; Mancone et al., 2025). Peer influence refers to the influence of friends and social groups on gaming. In the SCT framework, peers are very potent social models whereby attitudes and behaviors are formed by reinforcement as well as observational learning. It is not only possible to learn by observing the results of other actions but not only by direct reinforcement. SCT acknowledges that the environment, including peer groups and social context, is an important determinant of behavior by modeling and reinforcing behavior (Bandura, 2019; Devi et al., 2017). This applies particularly in peer-influenced situations (Thompson, 2008). Research has proven that peer influence is an influential predictor of IGD, and young adults aged 18 and above are more likely to adopt problematic gaming patterns under the influence of peers who support or are engaged in excessive gaming (Gao et al., 2025; Mancone et al., 2025; Yu et al., 2021).

According to the principles of the SCT, the role of human agency cannot be overestimated, and people intentionally influence their behavior by means of self-control, pre-planning, and deliberation (Bandura, 1991). One of the central points of reducing impulsive tendencies is the use of such constructs as intrinsic self-regulation and inhibitory control that allow individuals to restrain the sense of immediate satisfaction or the tempting influence of an immediate reward (Werner & Ford, 2023). The concept of IGD has been linked to increased impulsivity, as far as the individuals with high impulsive tendencies are more vulnerable and less armed to resist the temptation of compulsive gaming sessions (Hammad et al., 2024; Raybould et al., 2024; Szyszka et al., 2025; Zhu et al., 2023).

It can be expected that an enhanced impulsivity has a positive impact on IGD, as

greater impulsivity is more likely to impair self-control mechanisms and increase sensitivity to immediate rewards, which enhances the likelihood of becoming compulsive in gaming (Kim et al., 2021; Raybould & Tunney, 2024; Şalvarlı & Griffiths, 2019; Szyszka et al., 2025). Simultaneously, neurobiological studies indicate that impulsivity is associated with dysfunctional functional connectivity of neurocircuitry related to reward processing and self-regulative capabilities in people with IGD (Kim et al., 2021).

The relationships in this conceptual framework are further supported by the findings in empirical research. It is demonstrated that IGD can be directly and indirectly shaped by impulsivity, self-control as well as peer influences via maladaptive gaming cognitions, and cognitive processes enhance the impact of risk factors at the personal and environmental levels (Yu et al., 2021). The results of a large-scale longitudinal review also emphasize that the intrapersonal attribute, such as impulsivity, is one of the most powerful predictors of IGD over time, whereas the peer relations and social support still have significant influences on the development of the gaming behavior (Zhuang et al., 2023). In line with this, a systematic review of personality variables determines impulsivity as a reliably significant predictor of IGD in a variety of population groups, which supports its usefulness as a fundamental personal weakness (Gervasi et al., 2017). Moreover, there is prospective cohort evidence that peer dynamics and IGD are mutually dependent across time, which suggests that the process of peer influence is not only contributory but also a continuous reciprocal process that relates to problematic gaming (Gao et al., 2025). Collectively, these results are consistent with the SCT since they demonstrate the combined influence of personal factors and social context in the development of IGD risk using cognitive, behavioral, and interpersonal mechanisms.

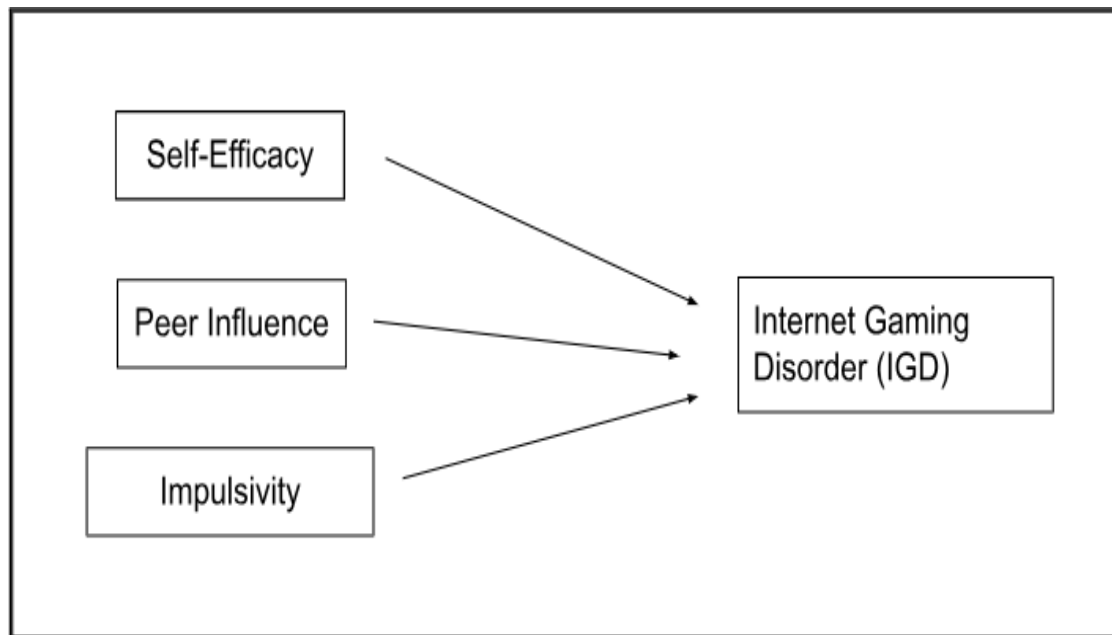
The theoretical model, which is based on the SCT, explains how personal elements, including self-efficacy and impulsivity, along with environmental forces,

including peer norms, combine to predict the risk of IGD among players of Malaysian MOBA. The scientific data show that these determinants work in reciprocal and interconnected cognitive and behavioral routes, which, in turn, supports the SCT statement according to which behavior is the result of ongoing interaction of personal agency and environmental forces. In turn, this framework offers a solid theoretical framework on how these predictors can be used in synergy to influence IGD, as well as offering a concise path onto which further empirical research in the context of this population can be conducted.

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Figure 2.1

The Conceptual Framework for Examining the Associations among Self-Efficacy, Peer Influence and Impulsivity to the Internet Gaming Disorder (IGD) among Emerging Adult Multiplayer Online Battle Arena (MOBA) Players in Malaysia.



Chapter III

Methodology

Research Design

In the present study, quantitative, correlational, cross-sectional research design were implemented to investigate the roles of self-efficacy, peer influence, and impulsivity as predictors and IGD as the outcome variable among emerging adults MOBA players in Malaysia. Quantitative research involved in the systematic collection and analysis of numerical data to investigate the patterns, relationships and trends of human behaviour (Rana et al., 2021). A quantitative approach was utilized in the current study as it allowed the measurement of psychological and social factors and their associations with IGD numerically. The collected data were analysed by using statistical software such as SPSS to determine the strength and direction of the associations among the variables (Jalolov, 2024).

Additionally, correlational research design was utilized in the present study, which is a non-experimental method for determining and analyzing the statistical association between two or more variables without any manipulation (Lorenz-Spreen et al., 2023). The purpose of correlational design was to effectively determine the strength and direction of associations among self-efficacy, peer influence, impulsivity, and IGD among emerging adult MOBA players in Malaysia. Correlational design enables the examination of predictive relationships among variables while maintaining the natural context of participants' behaviours. Hence, correlational design does not indicate causation due to the relationships being based on observed associations rather than controlled conditions (Krause, 2018).

Furthermore, the present study implemented a cross-sectional study design, which allowed researchers to collect data quickly and cost-effectively at a single point of time from a targeted population (Wang & Cheng, 2020). This made it appropriate for studies that involved emerging adults and specific groups of gamers, where timely and accessible

data collection was important. At the same time, cross-sectional design provided insight among the associations between variables within targeted populations. Kesmodel (2018) stated that cross-sectional studies could be either descriptive or analytical. Correlational cross-sectional studies focused on the outlining of characteristics or the frequency of the certain variables in a population while analytic cross-sectional studies examined the potential associations between several factors.

Sampling Method

A non-probability purposive sampling plan is especially appropriate in the research on the emerging adults who play MOBA games in Malaysia since it allows the subjects that fit exactly the specific criteria that the study objectives are based on, including demographic age sample, extent of gaming experience, and gaming behaviour (Anandya et al., 2023; Tuzzahra & Edastoma, 2024). Where the target population is large, scattered over geographies or otherwise inaccessible as is commonly the case with MOBA players whose overall numbers and distribution across regions is unavailable, purposive sampling can be used to make sure that only individuals with the attributes of relevance in terms of experience and engagement are included. Such a biased inclusion, in its turn, increases the quality and relevance of the empirical results (Etikan et al., 2016; Tuzzahra & Edastama, 2024).

This methodological decision is determined by the geographically spread population of the study and the intrinsic challenges of following such people. The sample was deliberate to guarantee the higher quality and relevance to the target demographic, with participants chosen based on the following inclusion criteria: (1) participants aged from 18 to 29 years old, (2) Malaysian nationals, and (3) individuals who had played MOBA games for at least one year. This deliberate selection ensured that the sample was highly relevant to the target population (Khor et al., 2019).

In contrast, probability sampling aims at statistical generalizability, whereas purposive sampling aims at depth and contextual relevance, which is a necessary factor in quantitative, exploratory, or context-specific research activities (Campbell et al., 2020; Nyimbili & Nyimbili, 2024; Tongco, 2007). There are empirical evidence showing that purposive sampling can produce strong and valid data, even more efficient and informative in some cases than random sampling, especially where the study requires expertise or experience on the part of the informants (Nyimbili & Nyimbili, 2024; Tongco, 2007). Purposive sampling a strict and realistic selection method when the aim is to produce deep and context-driven insights instead of broad population estimates (Campbell et al., 2020; Etikan et al., 2016; Nyimbili & Nyimbili, 2024; Tongco, 2007).

Snowball sampling is an extension of purposive sampling, where social networks of those selected in the initial participants are used to recruit other MOBA players in the applicable gaming communities (Gierczyk et al., 2024; Naderifar et al., 2017). Such a methodological approach can be particularly beneficial in cases of approaching hard-to-reach cohorts or geographically distant ones, like online groups of gamers, where there are no existing registries of respondents (Leighton et al., 2021). SCT emphasizes that the social context, peer modeling and communal influence are very salient factors of behavioral consequences. Using snowball sampling, a researcher can access intertwined networks in which the processes of social learning and peer pressure are, which makes it easier to capture dynamics core to SCT (Nyimbili & Nyimbili, 2024).

Sample Size

Sample size is the total number of participants selected from a population to take part in a study that used to make inferences about the whole population (Taherdoost, 2016). The present study calculated the required sample size using G*Power version 3.1.9.7, which is a common software for conducting power analyses in research regarding the field of social

science (Faul et al., 2007). Effect size, statistical power, the amount of predictors, and alpha error probability were considered as four essential elements in the calculation. A multiple linear regression (MLR) analysis was implemented in the present study. The effect size of each predictor was calculated by the formula $f^2 = \frac{R^2}{1 - R^2}$. After summing the effect sizes of the three predictors and dividing the total by three, the average effect size was obtained and used as the total effect size (refer to Appendix A).

Following this, the calculated average effect size was 0.1373. The calculated sample size from G*power showed a minimum of 130 participants were required, which this result is based on G*Power calculation by using a 0.05 alpha level, 0.95 statistical power and three predictors (refer to Appendix B).

Participants

The first inclusion criterion of the participants in the present study are Malaysian emerging adults between the age of 18 to 29 years old, including tertiary school students as well as adults who start working. The next inclusion criterion of participants are having gaming experience with MOBA gaming, such as *Honor of King*, *League of Legends*, and *Dota 2*. The present study excludes individuals who are not between the ages of 18 and 29 years old since those individuals are not considered as emerging adults. Furthermore, the present study excludes participants who did not play MOBA games as the study aimed for MOBA game genre only.

Location

The survey questionnaire of the current study was distributed throughout all Malaysian states using different social networking platforms such as Discords, WhatsApp, Instagram and Facebook, to recruit emerging adults who age from 18 to 29 years old and engaged in MOBA games for at least one year.

Instruments

Internet Gaming Disorder Scale 9-Short-Form (IGDS9-SF)

Internet Gaming Disorder Scale 9-Short-Form (IGDS9-SF). The IGDS9-SF was used to assess the participants' severity of the IGD symptoms. The IGDS9-SF was developed by Pontes and Griffiths (2015) to measure the nine diagnostic criteria for IGD as defined in the DSM-5. The scale includes nine items, with each item corresponds to one of the DSM-5 criteria such as preoccupation, loss of control, withdrawal, and constantly gaming despite the negative consequences. The scale uses a 5-point Likert scale that ranges from 1 (*never*) to 5 (*very often*). In the present study, IGDS9-SF has a Cronbach's alpha of 0.929 in the reliability analysis, which is considered as a high internal consistency (refer to Appendix F).

New General Self-Efficacy Scale (NGSES)

Chen et al. (2001) developed the NGSES to assess the participants' overall belief in the capability to perform well in wide range of situations. The scale consists of 8 items, which each item is designed to assess the participant's overall belief in their abilities rather than confidence in a specific task. The scale uses a 5-point Likert scale that ranges from 1 (*strongly disagree*) to 5 (*strongly agree*). A higher score would indicate there is a high level of self-efficacy while a lower score would indicate a low level of self-efficacy. In the present study, the internal consistency reliability is high with Cronbach's alpha values of 0.945 (refer to Appendix F).

Impulsive Behaviour Short Scale-8 (I-8)

The Impulsive Behaviour Short Scale-8 (I-8) was developed by Groskurth et al. (2022) to assess the impulsivity across several behavioural domains. The scale contains 8 items to measure the four dimensions of impulsivity which are urgency, lack of premeditation, lack of perseverance and sensation seeking. Each dimension would represent two items. Also, the scale consists of reverse coded items. The items are rated on a 5-point

Likert scale from 1 (*does not apply to all*) to 5 (*applies completely*). The scale consists of a moderate to good internal consistency with the Cronbach Alpha value of 0.717 in the reliability analysis of the present study (refer to Appendix F).

Peer Influence for Internet Gaming Addiction Scale

The Peer Influence for Internet Gaming Addiction scale is developed by Wu et al. (2016) to examine perceived peer influence on Internet gaming addiction (IGA) using a six-item instrument. This scale measures two domains of peer influence on IGA including peers' attitude toward Internet gaming behaviour, and peers' gaming-related behaviours such as frequency of gaming and inviting the individuals to play. All six items in the present scale are rated on 4-point Likert scale, with higher scores describing that there is greater peer approval, more frequent Internet use affected by peers, and more invited from peers to engage in Internet use. Item 1 and item 2 are referred to the first domain in the present scale, rating from 1 (*totally against*) to 4 (*totally approves*). Items 3 to 6 are referred to the second domain, rating from 1 (*never*) to 4 (*all the time*). The internal consistency for the Peer Influence for Internet Gaming Addiction scale is considered as moderate to good with a Cronbach Alpha value of 0.766 in the reliability analysis of the present study (refer to Appendix F).

Data Collection Procedure

The questionnaires were designed in Qualtrics including informed consent statement, personal data collection form, demographic items, three standardised scales (refer to Appendix C) and submitted to the Scientific and Ethical Review Committee (SERC) of Universiti Tunku Abdul Rahman (UTAR) for applying ethical review. On 21 January 2026, the ethical clearance was approved with the reference number of U/SERC/78-685/2026. The approval validity was valid for one year only, from 15 January 2026 – 14 January 2027. Data

collection began only after ethical clearance had been obtained from all relevant authorities, ensuring that all procedures complied with established research ethical guidelines.

Pilot Study. The pilot study is conducted to evaluate the research design's viability and improve the methodology before the actual study is conducted (Lowe, 2019). To evaluate the questionnaire's reliability, a minimum sample size of 30 respondents will be adequate (Bujang et al., 2024). Therefore, the present pilot study collected 80 sample data to ensure the stable reliability, but only 50 cases proceeded to the data analysis. 29 respondents were eliminated due to non-Malaysian, over 29 years old and incomplete responses. Statistical Package of the Social Sciences (SPSS) was applied for data analysis in the present pilot study to measure the reliability of each scale, where the Cronbach Alpha of each scale showed good reliability (refer to Appendix E).

Actual Study. An actual study was implemented through Microsoft Form after reviewing the pilot study. The consent was put on the first page of the survey to ascertain that it was voluntary, and all the respondents were clearly told that their personal data and information would be kept confidentially. Those respondents that agreed to the acknowledgment of notice were to fill in demographic items and subsequently to fill in the four standardised scales. There are items to quickly identify and filter out those invalid respondents such as "Nationality", and "Have you been playing MOBA games (e.g., Mobile Legend, Dota 2, Honor of King, etc) for at least 1 year?". For those who had chosen "Non-Malaysian" or "No" at the above questions were directly navigated to the end of the survey, which sped up the data cleaning process. On average, respondents spent five to seven minutes to complete the current survey, including demographic information, IGDS9-SF, NGSES, I-8, and Peer Influence for Internet Gaming Addiction scale.

The links, QR code and the poster of the current survey were generated and distributed to several platforms including WhatsApp, Instagram, Facebook and Discord. The

Facebook groups included Honor Of Kings Global Malaysia, Malaysia League of Legends, 大马PC游戏交流区, Malaysia Mobile Legends, POKEMON UNITE MALAYSIA 寶可夢大集結, 王者荣耀国际服 HOK MALAYSIA, Dota 2 Malaysia. A total of eight Facebook groups were approached and six of the groups' administrators approved for posting of the data collection messages. While there have total of three Discord groups were approached included Vinland, 弟弟联盟, and Malaysia Dota 2 Community, and all the groups' administrators approved for posting of the data collection messages. Additionally, the researchers physically approached potential respondents at UTAR over a period of approximately one week. After the respondents were sufficient, the researchers stopped recruiting the respondents and exported the data to Excel for data cleaning from Microsoft Form, subsequently imported to SPSS for the further data analysis.

Data Analysis

Data Cleaning

Data cleaning is the identification and correction of data anomalies, such as missing values, outliers, inconsistencies, and noisy or incorrect values before analysis. The core aim of it is to improve data quality hence reducing bias and volatility of statistical estimates and models. It is empirically proved that dirty data may facilitate biased parameter estimates and incorrect evidence-based decisions, and systematic data cleaning contributes to the validity and accuracy of research results (Sharifnia et al., 2025; Whang et al., 2023).

Normality Assumption Tests

Five indicators, namely histogram, the normal Q-Q plot, skewness, kurtosis, and the Kolmogorov-Smirnov (K-S) test were utilized to assess the normality. While skewness, kurtosis, and the K-S test were employed as quantitative indicators, the histogram and normal Q-Q plot were employed as visual techniques to assess whether the data were normally distributed. Approximate normality is shown by a bell-shaped histogram and a Q-Q plot with

points near the diagonal line. Values in the acceptable range for skewness and kurtosis indicate no significant departure from normalcy. A non-significant result for the K-S test, on the other hand, means that the data are approximately normally distributed.

Histogram. A histogram is a diagram that depicts the number of times values fall in the successive categories and hence, summarises the centre, spread, skewness and any possible outliers of the distribution. Histograms have widely been promoted as a tool in assumption checking since they allow visual examination of normality, as well as other distributional properties, upon which most parametric methods rely (Korkmaz et al., 2014; Newburger et al., 2022; Shatz, 2023; Weissgerber et al., 2015). Studies of visualization reveal that histogram-like visualization allows viewers to infer the shape of the distribution and approximate the parameters, including the mean and the spread, at reasonable accuracy even in the case of some bias (Newburger et al., 2022).

Q-Q plot. A Q-Q plot is a graphical device that contrasts the quantiles of a theoretical distribution with the quantiles of observed data. The points are close to a straight line, which implies that the sample distribution is similar to the reference distribution. The systematic deviations like the S-shapes, heavy tails, or curvature show certain types of non-normality, such as skewness or kurtosis (Cain et al., 2016; Korkmaz et al., 2014; Shatz, 2023). Assumption checking Methodology Q-Q plots are highly preferred due to deeper, more informative information as compared to one p-value obtained as a result of a normality test and help to understand the shape and magnitude of the violations (Knief & Forstmeier, 2021; Korkmaz et al., 2014; Shatz, 2023).

Skewness and kurtosis. The skewness and kurtosis are numerical values, which summarise the distribution shape. Skewness measures asymmetry, and kurtosis measures tail heavy and peakedness in comparison to the normal distribution (Bono et al., 2019; Kamath et al., 2025; Kim & Kim, 2025; Sama et al., 2020). Largely absolute values indicate non-

normality, which can inflate the type I errors and falsify the factor analysis, t-tests, and other parametric tests unless addressed (Bono et al., 2019; Cain et al., 2016; Kamath et al., 2025; Knief & Forstmeier, 2021). Other researchers suggest that skewness and kurtosis should be reported regularly along with the means and variances as part of the necessary descriptive statistics and assumptions tests (Bono et al., 2019; Cain et al., 2016; Korkmaz et al., 2014).

Kolmogorov-Smirnov Test (K-S test). The K-S test is a normality test which measures the greatest absolute difference between the cumulative distribution of a sample and the cumulative distribution of a given theoretical distribution. It is one of a number of distributional test tools used to test the absence of a parametric technique before use (Kamath et al., 2025; Shatz, 2023). The normality diagnostics review indicates that no single test is always more effective than others because power and type I error vary depending on a sample size and the specific non normality (Kamath et al., 2025; Korkmaz et al., 2014; Shapiro & Wilk, 1965). As such, the K-S test is not quite the indicator of normality but should be included in a larger set of tests and plots (Kamath et al., 2025; Korkmaz et al., 2014; Shatz, 2023).

Descriptive Statistics. Standard deviation, range, skewness, mean, and median are examples of descriptive statistics that are used to summarise salient characteristics of a dataset without any inferential statements about populations. They provide the necessary background to make the conclusions, evaluate the assumptions, and conduct comparisons of the studies. In this study, descriptive statistics were generated for the main variables, namely self-efficacy, peer influence, impulsivity, and Internet Gaming Disorder among emerging adult MOBA players in Malaysia.

Multiple Linear Regression (MLR) Assumptions. The MLR assumption was implemented to examine the predictive factors of self-efficacy, impulsivity and peer

influence to IGD. The appraisal of MLR assumptions was conducted immediately after examining normality.

Multivariate Outliers. Data points that are distinctly different from the main body of the data which can have a disproportionate influence on the study's findings refers to outliers (Aguinis et al., 2013). Rather than an extreme score on a single variable, a multivariate outlier refers to a case that exhibits an unusual combination of values across multiple variables (Leys et al., 2018). In the current study, multivariate outliers are identified by Cook's Distance, Mahalanobis Distance, and Centered Leverage Value. Each of the data point's impact on the regression model was assessed using Cook's Distance, which the values lower than 1 considered as acceptable (Cook, 1977). Mahalanobis Distance utilizes the covariance matrix and sample means to calculate each case's distance from the centroid. The values falling below 15 were considered as admissible, indicating absence of multivariate outliers (Barnett, 1978). In addition, the Centered Leverage Value assessed how far each data point deviates from the mean. The formula $\frac{2(p+1)}{n}$, where p is the amount of predictors and n is the sum of sample size, can be utilized to identify the outliers. Thus, identifying outliers ensured the data quality and enhanced the validity of the further data analysis using these established criteria.

Type of variables. Discrete variables such as nominal and ordinal variables, and continuous variables such as ratio and interval variables are the two categories in variables (Kaur & Mittal, 2021). All the scales used in the present study employed Likert-type items and are considered interval data due to the analysis focused on the total scores of each scale, which summed scores are assumed to have equal intervals between values, thus suitable for statistical analysis.

Multicollinearity. Multicollinearity happens when two or more predictor variables in a multiple regression model correlates with each other, which can change the estimation of

the unique effects on the predictors. Tolerance and the Variance Inflation Factor (VIF) are commonly used to quantify the extent of relationship among the predictors to assess the assumption (Marcoulides & Raykov, 2019). The VIF shows that the variance of a regression coefficient is increased due to the multicollinearity which a higher value would mean there will be less reliable results (Shrestha, 2020). Tolerance would be defined as the inverse of VIF which represents the predictor's variation is independent of other predictors (Shrestha, 2020). the VIF must be below 10, however the standard range for the tolerance was higher than 0.10 (Kyriazos & Poga, 2023).

Independence of Residuals. According to Schober et al., (2018), the lack of correlation between the variables being studied, refers to independence of residuals. The Durbin-Waston test can be utilized to evaluate the independence assumption, where the values closer to 2 would indicate that the residuals are independent (Flatt & Jacobs, 2019).

The normality of residuals, linearity between variables, and homoscedasticity. Homoscedasticity in regression assumes that the variance of the residuals remains constant across all the combinations of the predictor values (Osborne & Waters, 2002). The assumption can be observed visually using the scatterplot of standardized residuals. The assumption of equal variances is considered satisfied when the residuals are dispersed evenly around the horizontal zero line with no distinct pattern (Osborne & Waters, 2002).

Chapter IV

Results

Data Cleaning

Before performing statistical analyses, the data cleaning was implemented to ensure the accuracy, consistency, and reliability. This undertaking is essential in identifying and removing errors, inconsistencies, and poor answers, and, therefore, allowing the dataset to better reflect the target demographic. Strict data screening and cleaning procedures simultaneously enhance the validity and reproducibility of the study results (Guillen-Aguinaga et al., 2025). The raw data that had been obtained in the online survey system was transferred to the IBM SPSS Statistics where the data underwent screening and analysis.

Valid Data

Valid data involves such data on answers that have been accurately documented and which is appropriate to undergo statistical analysis. Inaccurate or corrupted records can bring a bias and ruin the accuracy of the dataset. In the first place, 178 responses were collected to this study. In the initial screening phase, five subjects who did not consent to participating in the research were removed because ethical approval requires that the responses of individuals who voluntarily signed to undertake the study should be factored in the analysis process.

Missing Data

Missing data occur when the respondents do not answer one or multiple items of the questionnaires. In a survey research, inadequate data may reduce the test sensitivity, leading to distortions in the inferring parameters, and undermining the fidelity of research findings unless effective measures are taken (Popovich, 2024). In this study, thirteen responses were considered incomplete as a result of partial filling of questionnaires. These responses were eliminated in order to have what should only represent complete records.

Disqualified Data

Disqualified data refer to those answers which do not fulfill the inclusion criteria of the study. Since the study targeted MOBA players among the emerging adults of Malaysia, those who did not meet such criteria were not included in the study. As such, eight non-Malaysian respondents were removed from the dataset.

Straight-Lining Data

Straight-lining is the situation when the respondents give similar answers in consecutive survey questions without actually contemplating about the question. Such a trend compromises reliability and validity of the survey results, which may mean that there is little involvement in answering (Wang, 2025). The manual scrutiny of the patterns of response was adopted in the study in order to identify this kind of behavior. There were also two cases of straight-lining that were found and then eliminated.

Normality Assumption Tests

Normality

The data were assessed for normality before conducting multiple regression and mediation analysis. The assumption of the normality is evaluated by the five indicators which includes histograms, Quantile-Quantile plot (Q-Q plot), skewness and kurtosis and Kolmogorov-Smirnov (K-S) test.

Histogram

The result for the histogram for each of the variables has shown a normally distributed outcome as the histograms were in the bell-shaped distribution. This showed the assumption of normality for histogram was not violated (refer to Appendix H).

Q-Q Plot

The Q-Q plots suggested that the variables satisfy the normality assumption as the data points follow the expected normal distribution pattern. The Q-Q plots for IGD, self-

efficacy, impulsivity and peer influence show equally diffused spots along the diagonal line, indicating the normality assumption was supported (refer to Appendix I).

Skewness & Kurtosis

The skewness and kurtosis values for all variables fell between the appropriate range of ± 2 . The value of Skewness ranged from -0.424 to 0.157 , and Kurtosis' values ranged from -0.560 to -1.315 (refer to Table 4.1). This indicates that there are no violations and a satisfactory level of assumption of normality (refer to Appendix K).

Table 4.1

Skewness and Kurtosis value for each variable

	Skewness	Kurtosis
IGD	.157	-1.315
Self-efficacy	-.628	-.590
Impulsivity	.103	-.962
Peer Influence	-.424	-.560

Kolmogorov-Smirnov

The Kolmogorov-Smirnov test indicates that IGD, self-efficacy, impulsivity and peer Influence significantly deviate from normality ($p < 0.05$). All the variables are distributed non-normally (refer to table 4.2). According to Sibinda et al. (2025), a p-value that is less than .05 indicates a statistically significant deviation from the normality which results that the data are not normally distributed.

Table 4.2*Kolmogorov-Smirnov (K-S) Test*

Variables	Sig. value
IGD	<.001
Self-efficacy	<.001
Impulsivity	<.001
Peer Influence	<.001

Descriptive Statistics

The final sample of the present study consisted of 149 respondents who met the inclusion criteria of being emerging adults aged from 18 to 29 years old and having at least one year of experience playing MOBA games. Among the participants, the largest age group was 22 years old (18.1%, $n = 27$), followed by 24 years old (16.8%, $n = 25$) and 21 years old (14.8%, $n = 22$). Other age groups included 23 years old (12.8%, $n = 19$) and 25 years old (12.8%, $n = 19$), while smaller proportions were observed for ages 20 (10.1%, $n = 15$), 19 (3.4%, $n = 5$), 26 (3.4%, $n = 5$), 27 (2.7%, $n = 4$), 28 (2.7%, $n = 4$), 29 (2.0%, $n = 3$), and 18 (0.7%, $n = 1$).

With regard to gender distribution, 53.7% of the respondents were male ($n = 80$), 45.0% were female ($n = 67$), and 1.3% that preferred not to say ($n = 2$). For ethnicity, most of the respondents were Chinese (91.3%, $n = 136$), followed by Malay (4.7%, $n = 7$), Indian (3.4%, $n = 5$), and Dayak (Sarawak Native) (0.7%, $n = 1$). Regarding gaming experience, 49.7% of the respondents reported having played MOBA games for 4 to 5 years ($n = 74$). Additionally, 20.8% had been playing for 1 to 2 years ($n = 31$), 17.4% for 3 to 4 years ($n = 26$), and 12.1% had more than 5 years of gaming experience ($n = 18$). Predominantly, most respondents engaged in 王者荣耀 among the MOBA games (24%, $n = 87$).

In terms of gaming frequency, 32.9% of the respondents reported playing MOBA games 5 to 6 times per week ($n = 49$), 29.5% played 3 to 4 times per week ($n = 44$), 24.8%

played more than 6 times per week ($n = 37$), and 12.8% played 1 to 2 times per week ($n = 19$). With respect to daily gaming duration, 55.0% of respondents reported spending 1 to 2 hours per day playing MOBA games ($n = 82$), 26.8% spent 3 to 4 hours per day ($n = 40$), 8.7% spent 5 to 6 hours per day ($n = 13$), 7.4% spent less than 1 hour per day ($n = 11$), and 2.0% spent 7 to 8 hours per day gaming ($n = 3$).

Descriptive statistics were also computed for the main study variables. The results indicated that the mean score for IGD was 1.93 ($SD = 1.00$). The mean score for self-efficacy was 2.45 ($SD = 0.87$), suggesting a moderate level of perceived self-efficacy among respondents. Meanwhile, the mean score for impulsivity was 1.92 ($SD = 0.65$), and the mean score for peer influence was 2.03 ($SD = 0.53$). These results provide an overview of the central tendency and variability of the key variables examined in this study presented in Table 4.3.

Table 4.3

Descriptive Statistics for Respondents' Demographic Information (N = 149)

		<i>n</i>	<i>%</i>	<i>M</i>	<i>SD</i>
Nationality					
	Malaysian	149	100		
Age				22.94	2.28
Gender					
	Female	80	53.7		
	Male	67	45.0		
	Prefer not to say	2	1.3		
Race					
	Chinese	136	91.3		
	Malay	7	4.7		
	Indian	5	3.4		
	Others	1	0.7		

Table 4.3*Descriptive Statistics for Respondents' Demographic Information (N = 149) (Continued)*

	<i>n</i>	<i>%</i>	<i>M</i>	<i>SD</i>
Have you been playing MOBA games for at least 1 year?				
Yes	149	100		
What type of MOBA games do you play?				
Mobile Legends: Bang Bang	55	15.15		
Dota 2	44	12.12		
League of Legends	55	15.15		
Honor of Kings	68	18.73		
王者荣耀	87	23.97		
League of Legends: Wild Rift	17	4.68		
Pokémon Unite	23	6.34		
Smite	5	1.38		
Heroes of the Storm	6	1.65		
Other	3	0.83		
How many years have you been playing MOBA games?				
1–2 years	31	20.8		
3–4 years	26	17.4		
4–5 years	74	49.7		
More than 5 years	18	12.1		
How frequently do you play MOBA games?				
1–2 times a week	19	12.8		
3–4 times a week	44	29.5		
5–6 times a week	49	32.9		
More than 6 times a week	37	24.8		

How many hours do you spend playing MOBA games each day?

Table 4.3*Descriptive Statistics for Respondents' Demographic Information (N = 149) (Continued)*

	<i>n</i>	<i>%</i>	<i>M</i>	<i>SD</i>
Less than 1 hour	11	7.4		
1–2 hours	82	55.0		
3–4 hours	40	26.8		
5–6 hours	13	8.7		
7–8 hours	3	2.0		

Note. Percentages for “What type of MOBA games do you play?” are based on total responses (N = 363), as respondents could select more than one game.

Multiple Linear Regression (MLR) Assumptions

Multivariate outliers

Cook's Distance, Mahalanobis Distance, and Centered Leverage Values were utilized to assess multivariate outliers, ensuring that no individual cases exerted disproportionate influence on the regression model. There was a total of seven cases viewed as potential outliers due to exceeding two standard deviations (refer to Table 4.4). According to Table 4.5 below, all Cook's Distance values were below 1, suggesting that no cases had an undue influence on the regression estimates. Similarly, all Mahalanobis Distance values were below 15, indicating no significant multivariate outliers. The Centered Leverage Value was 0.052 which evaluated using the formula $\frac{2(p+1)}{n}$. Case four with the value of 0.0547 was over the cut-off value of 0.052, thus indicating a potential influential case (refer to Table 4.5). Hence, case four was considered sparse cases and was excluded from the data set. Following this, 149 cases were used in the final analysis.

Table 4.4*Casewise Diagnostics*

Case Number	Std. Residual	Mean_I GD	Predicted Value	Residual
4	-2.355	1.11	2.6733	-1.56221
9	-2.085	1.00	2.3833	-1.38332
61	2.904	3.00	1.0733	1.92673
79	2.028	2.33	.9877	1.34562
117	-2.392	.67	2.2537	-1.58708
127	-2.161	1.33	2.7672	-1.43386
130	2.398	3.00	1.4094	1.59061

Table 4.5*Casewise Summaries*

Case Number	Mahalanobis Distance	Cook's Distance	Centered Leverage Value
4	8.32472	0.00102	0.05477
9	6.97745	0.00099	0.04590
61	2.97193	0.00215	0.01955
79	2.59331	0.00008	0.01706
117	1.55645	0.00229	0.01024
127	1.20605	0.00874	0.00793
130	0.93489	0.00111	0.00615

Independence of Residuals

The independence of residuals was evaluated by the Durbin-Waston test in the present study. The Durbin–Watson statistic was 2.099, which is near to the optimal value of 2 (refer to Table 4.6, Appendix M). This indicates that the residuals are independent and that there is

no significant correlated to each other, suggesting the assumption of independence of residuals is satisfied.

Table 4.6

Independence of Errors

Model	Durbin–Watson
1	2.099

Multicollinearity

Multicollinearity can affect the accuracy of the parameter estimates, which occurs when the independent variables are correlated in a regression (Daoud, 2017). Tolerance and Variance Inflation Factor (VIF) were utilized to assess multicollinearity in the present study. Tolerance and Variance Inflation Factor (VIF) values were utilized to assess multicollinearity in the present study. All the tolerance values are higher than 0.1, suggesting low multicollinearity (refer to table 4.7). Meanwhile, all the VIF values were below the general threshold of 10, suggesting that multicollinearity is not a concern in the present model, and the regression coefficients can be interpreted reliably (refer to table 4.7).

Table 4.7

Tolerance and VIF values

	Tolerance	VIF
Self-efficacy	.962	1.039
Impulsivity	.762	1.312
Peer Influence	.779	1.284

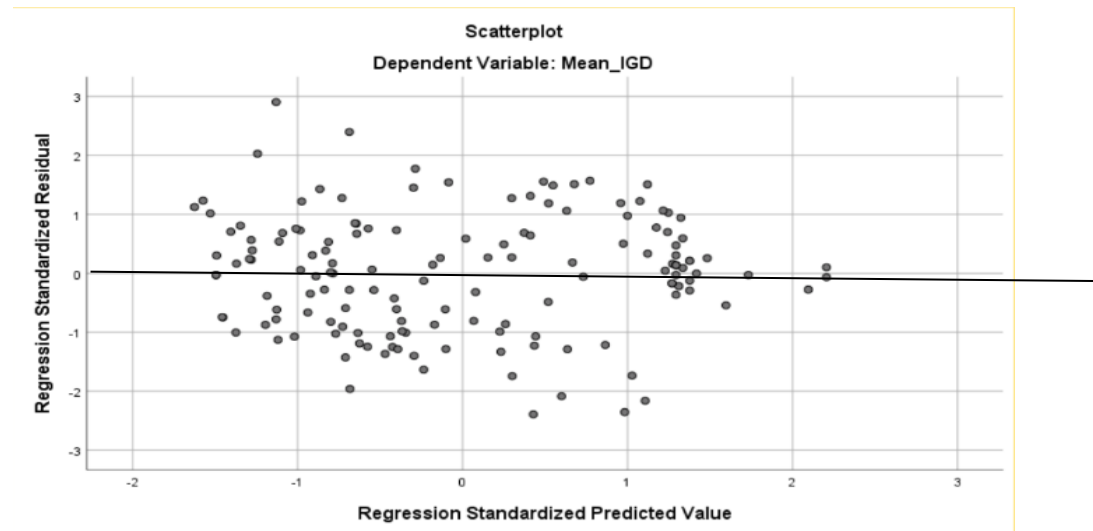
Normality of Residuals, Linearity and Homoscedasticity

Scatter plots were used to examine the assumptions of normality, linearity, and homoscedasticity. According to figure 4.1 below, the scatterplot demonstrated that the

residuals were randomly distributed and clustered at the diagonal line, showing the normal distribution. Following this, all three assumptions including normality, linearity, and homoscedasticity are satisfied and not violated (Osborne & Waters, 2002).

Figure 4.1

Scatterplot



Multiple Linear Regression Analysis

The predictive roles of self-efficacy, impulsivity, and peer influence on IGD among MOBA players in Malaysia were investigated using a multiple regression analysis. The results show statistical significance as $F(3, 145) = 64.312, p < .001$ and explaining 56.2% of the variance (refer to Table 4.9).

The results from the coefficient table showed that impulsivity ($\beta = 0.584, p < .001$) and peer influence ($\beta = 0.174, p = .006$) significantly and positively predicted IGD. While self-efficacy ($\beta = -0.217, p < .001$) is a significant negative predictor of IGD. From the result of this study, self-efficacy, impulsivity and peer influence have predictive roles in IGD among MOBA players in Malaysia. In Table 4.10, the summary of results shows that hypotheses H_1 , H_2 and H_3 are supported. Among the predictors, impulsivity has the strongest predictive effect on the IGD, as it has the highest standardized beta coefficient ($\beta = 0.584, p$

< .001), followed by Peer Influence ($\beta = 0.174, p = .006$) and self-efficacy ($\beta = -0.217, p < .001$).

Table 4.8

Anova Table

	Model	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
1	Regression	84.909	3	28.303	64.312	<.001
	Residual	63.813	145	.440		
	Total	148.721	148			

Table 4.9

Coefficient Table

	Std. β	<i>t</i>	<i>p</i>
Self – efficacy	-.217	-3.914	<.001
Impulsivity	.584	9.370	<.001
Peer Influence	.174	2.818	.006

Table 4.10

Summary of Result

Hypotheses	Std. β	<i>p</i>	Decision
<i>H</i> ₁ : Self-efficacy negatively predicts Internet gaming disorder among emerging adult Multiplayer Online Battle Arena players in Malaysia.	-.217	<.001	Supported
<i>H</i> ₂ : Impulsivity positively predicts Internet gaming disorder among emerging adult Multiplayer Online Battle Arena players in Malaysia.	.584	<.001	Supported
<i>H</i> ₃ : Peer influence positively predicts Internet gaming disorder among emerging adult Multiplayer Online Battle Arena players in Malaysia.	.174	.006	Supported

Chapter V

Discussion and Conclusion

Hypotheses

H₁: Self-efficacy negatively predicts Internet gaming disorder among emerging adult MOBA players in Malaysia

Self-efficacy was a negative predictor of IGD for the participants of the current study, and H₁ was therefore supported. Individuals with higher self-efficacy were less likely to report IGD symptoms, suggesting that self-efficacy may function as an important protective factor against IGD in this sample. This is perhaps not surprising given the range of things that self-efficacy encompasses. The tendency is not merely to be confident, but also to believe in one's ability to cope with stressful situations, regulate one's own behaviour, and achieve one's goals without experiencing a sense of being overwhelmed. When playing games, a person with high self-efficacy will likely have greater self-control over their gaming behaviour and is less likely to play games as a coping strategy in situations of stress and anxiety.

A noteworthy aspect regarding the findings is that self-efficacy was still a predictor of IGD when impulsivity and peer influence were included in the regression. This is not the first time this has been shown. For instance, Zhang et al. (2022) found that in Chinese undergraduates, individuals with lower social self-efficacy, or who felt socially incompetent in the real world, were more likely to have higher IGD severity. This is shown when someone who feels socially incompetent in the real world may be more likely to turn to videogames for social connection and the feelings of self-efficacy that videogames can provide. Warburton et al. (2022) and Zhuang et al. (2023) found increased protective factors such as self-control were associated with healthier game play. Xiang et al. (2022) also supported this by showing that developmental assets reduced the risk of IGD by boosting self-control.

All of this points to the fact that, as the current study finds, self-control is indeed protective against IGD. It is worth noting that games, and especially MOBA games, are rule-based. There are clear goals and rewards, levels to be achieved and many possibilities for success. In a study, Zhang et al. (2022) suggested low social self-efficacy can increase the use of online games for social interaction, while Warburton et al. (2022) found low protective factors lead to increased online gaming. By contrast, high self-efficacy indicates a person has the resources to navigate the world and can decide if they want to play games or not. This is something to be aware of for our group of emerging adult MOBA gamers. Emerging adulthood is a transition period such as between roles, between education and training, between jobs and social roles. MOBA games are a place of reward, acceptance and status. This may be especially so for an emerging adult who is "finding their feet" in the world. It may be an even more tempting lure for those with low self-efficacy, and for those with a higher belief in their ability to achieve might play for enjoyment, but not to excess. Hence, self-efficacy is an important factor when we examine and work to prevent IGD in this age group.

H₂: Impulsivity positively predicts Internet gaming disorder among emerging adult MOBA players in Malaysia

Impulsivity was identified as the strongest predictor among all the predictors, a significant positive predictor of IGD among emerging adult MOBA players in Malaysia. This finding might not be entirely unexpected given the processes underlying the construct of impulsivity, but the effect size in the present model is noteworthy. This aligns well with what existing literature has consistently shown. Hammad and AL-shahrani (2024) found that university students with higher impulsivity were more likely to experience IGD symptoms, while Yu et al. (2021) showed a similar pattern among Chinese adolescents and further noted that maladaptive thinking about gaming helped explain the link. Yan et al. (2021) approached

the issue slightly differently in comparing young adults with IGD against healthy controls and finding that the IGD group showed notably higher trait impulsivity and weaker inhibitory control, meaning their brains were not just more impulsive but less able to pump the brakes once something stimulating had started. Warburton et al. (2022) and Zhuang et al. (2023) found impulsivity to be a particularly strong predictor of IGD across different samples, reinforcing the risk factor.

That impulsivity is a key factor in MOBA gaming and gaming more broadly is partly a product of game design. MOBA games are interactive, and they are highly stimulating. Competition and time constraints create a sense of urgency to play and stay playing to improve ranking, game rewards and successes are delivered on variable schedules. The game is socially-focused on team game play, which means that quitting a game has interpersonal as well as individual implications. This set of circumstances is a difficult one for the impulsive person to resist. Hammad and Al-Shahrani (2024) suggested that games that provide rapid and frequent rewards are especially difficult for impulsive people because the reward structures tap into the impulses that make it hard for impulsive people to resist. Yan et al. (2021) argued that poor inhibitory control compounds this by making it harder to stop once play has begun. Yu et al. (2021) also noted that impulsive gamers may develop cognitive distortions around gaming, for example coming to believe that they need to play to feel okay, which further reinforces the cycle.

These points take on new salience when we consider the present study. Emerging adulthood isn't a life stage that's most conducive to managing impulsivity. It's a stage of life that's highly demanding, highly explorative and highly complicated. All of which are factors that make it less likely that impulsivity will be managed. If MOBA gaming exists as an easily accessible, highly rewarding and social gaming option, the path of least resistance for an impulsive emerging adult is a path to MOBA games. The current finding is more than a

confirmation of the established association between impulsivity and MOBA gaming, it places a known risk factor in a population and gaming environment where it is likely to have a potent influence and which may be ameliorated by interventions that improve impulse control skills.

H₃: Peer influence positively predicts Internet gaming disorder among emerging adult MOBA players in Malaysia

Our study also found that peer influence significantly and positively predicted IGD among emerging adult MOBA players in Malaysia, thus confirming H₃. In demonstrating that peer influence significantly and positively predicted IGD in the current sample, we add to the picture that is arising from the role of self-efficacy and impulsivity. The peer influence is especially potent in MOBA games among the emerging adults as these games are social and competitive, which means that they involve teamwork and the necessity to be in constant contact with peers. Adults in their early life stages tend to be frustrated when it comes to the satisfying of their fundamental psychological needs, and it is this frustration that may motivate them to find a satisfying gaming experience through the reasons of social connectedness, competition, and coping, and thus, elevating the risk of IGD (T'ng et al., 2022). Peer pressure supports gaming behaviour in that social norms and expectations are established at gaming communities, and players tend to over-indulge in gaming to fulfill their peer acceptance and status. Moreover, the socially positive attitudes toward gaming and peer support can increase involvement and addiction, particularly when the consumption of esports and related content on games becomes popular (Durak et al., 2023). Peer pressure and personal vulnerabilities such as need frustration contribute to addictive behaviours because they offer social confirmation and emotional respite to the young adult MOBA players (Király et al., 2023). Therefore, peer pressure is a strong environmental determinant that enhances addictive behaviours in MOBA games among this age group.

Social influence is not new but has sometimes been seen as secondary to interpersonal influences. Zhuang et al. (2023) recognised in their meta-analysis that while interpersonal factors generally account for less variance in IGD than intrapersonal factors, they are a robust and theoretically meaningful predictor of IGD over time. Yu et al. (2021) extended this line of thinking by proposing that interpersonal factors can influence the cognitive structures individuals use to make sense of their gaming, making it seem normal to spend lots of time gaming, and more difficult to recognise the signs of excessive gaming. Warburton et al. (2022) took a different tack, finding that experiences of social exclusion and poor protective social relationships were linked to greater use of gaming as a social activity, which implies that peer factors can be a risk factor in at least two ways, first by reinforcing gaming behaviour through direct social participation and expectations of others, and second by creating a social deficit that makes the social cues of gaming environments. Macur and Pontes (2021) similarly identified certain social-behavioural risk factors as increasing the risk of IGD and while their mechanisms were slightly different in emphasis, the same bottom line applies to this research where social factors are important, and peers play a role in those factors.

Understanding the influence of peers requires consideration of the demands that Multiplayer Online Battle Arena games place on players. These are not solitary games one plays at leisure. They are team-oriented, heavily reliant on communication, and involve long-term relationships between frequent players who come to share histories and expectations. Once a player's friends are active in a MOBA community, MOBA games no longer function primarily as a form of entertainment, but as a site for social activity. Not only is it about having fun, it is about being there for others who are expecting it. When this is the case, peer influence does not need to be overt and coercive to be influential. When peers are playing, and not playing is seen as a social risk, this may be enough to maintain high levels of

engagement in the absence of other factors that may have otherwise kept any given individual playing. Yu et al. (2021) noted that over time, this social reinforcement may come to influence how people view gameplay, from being something they choose to do to being something they have to do. Warburton et al. (2022) also noted that if gaming is the main way people connect, then reducing their gaming can impact on the social relationships that use gaming as a way to connect, and can be a disincentive to reduce gaming, especially if the signs of excessive gaming are emerging.

All of this makes sense within the present sample in obvious ways. Malaysian emerging adult MOBA players live in a social milieu where gaming is often not an isolated but rather a social activity, fostering the formation and maintenance of friendships and the formation of peer identities. The progressive increase in gaming, which is typical of the early stages of IGD, may well seem natural in this context. Each extra game is socially rewarding, each gaming hour a contribution rather than a waste of time. It's only the overall pattern that suggests trouble. This highlights the importance of strategies to prevent and treat IGD that are not simply focused on the individual but also on the social ecology that facilitates and supports the development of the behaviours.

Implication

Theoretical Implication

Social Cognitive Theory (SCT) developed by Bandura (1986) was used in the study to examine the association between self-efficacy, peer influence and impulsivity on Internet Gaming Disorder (IGD) among MOBA players in Malaysia. SCT highlights the dynamic relations between personal, behavioural and environmental factors that shape human behaviour. In this study, it provides a deeper understanding of IGD in the Malaysian MOBA gaming context which is an area with limited prior research. The findings show the applicability of SCT within a culturally relevant and socially interactive gaming environment.

In the study, self-efficacy was negatively associated with IGD which suggest that individuals with stronger beliefs in their ability to regulate behaviour are less likely to engage in the excessive gaming. This finding is consistent with SCT which suggests that the perceived behavioural control plays an important role in self-regulation and decision making. In contrast, impulsivity was found to positively predict IGD which suggests that individual differences in self-control plays an important role in the development of the problematic gaming behaviours. The findings would align with past research which found impulsivity as a key risk factor for IGD which impulsive individuals tend to prioritise the immediate rewards and display difficulties in the behavioural inhibition (Şalvarlı & Griffiths, 2019; Zhu et al., 2023). Hence, future studies could examine the factors such as the reward sensitivity and emotional regulation as the mediators with the gaming environment and cultural influences as the moderators.

Next, peer influence which is the environmental factor that positively predicts IGD suggests that individuals are likely to engage in excessive gaming due to the social pressure, group norms or the need for social belonging. The findings are consistent with SCT which highlights the role of observational learning and social reinforcement in shaping the behaviour. Therefore, future research could study the possible moderating factors for example the quality of the peer relationship, peer norms and the cultural values specifically within collectivist societies like Malaysia.

Overall, the findings suggest that IGD is better understood from a multidimensional perspective in which the cognitive beliefs, the personal traits, and the social influences work together to shape the behaviour. In this research, it contributes to the theoretical advancement of SCT by showing the need to consider both facilitating and inhibiting mechanisms at the same time. Hence, future studies could examine how these variables interact over time and

explore the contextual and cultural moderators to improve the theoretical models of IGD across the different populations.

Practical Implications

The findings of the study offer important practical implications for the educators, mental health practitioners, parents and game developers in addressing IGD among MOBA players in Malaysia. Targeted intervention strategies can be developed to reduce the problematic gaming behaviour by identifying self-efficacy, impulsivity and peer influence. Impulsivity emerged as the strongest predictor which highlights the need for targeted psychoeducation and interventions to be addressed. The use of approaches such as Cognitive-Behavioural Therapy (CBT), mindfulness-based strategies, and self-regulation training can help players manage urges, improve inhibitory control, and reduce impulsive decision-making. Collectively, these interventions can effectively lower impulsivity and decrease the risk of IGD.

Firstly, impulsivity could be a strong risk factor for IGD, and the interventions should emphasize increasing impulse control and emotional regulation. The mental health practitioners can use approaches like mindfulness-based interventions to help individuals improve self-control, identify their gaming triggers, and develop healthier coping strategies (Kunzmann et al., 2025; Sharma et al., 2021). The early detection of individuals with high impulsivity behaviours is important which allows for preventive measures to be implemented before the problematic gaming behaviours could become serious.

Secondly, the significant role of self-efficacy suggests that the intervention programs should focus on enhancing the individuals' confidence in their ability to regulate gaming behaviour. Counsellors and teachers can help students gain better control over their behaviour by using self-regulation exercises, goal setting, and time management strategies. Cognitive-behavioural techniques such as self-monitoring and reinforcement can help the individuals to

improve healthier habits in gaming (Byeon, 2025; Sugara et al., 2024). Strengthening self-efficacy could serve as a protective factor which can enable individuals to resist the excessive gaming and maintain their balance daily functioning.

Furthermore, the influence from peers highlights the importance of addressing the social environment in intervention efforts. The educational institutions and schools can promote positive peer norms by encouraging group activities that do not revolve around gaming and building supportive peer relationships. Peer-led interventions such as mentoring programs or group counselling may help reshape gaming-related norms and reduce social pressure to engage in excessive gaming (Männikköet al., 2022). Also, parents can help reduce the negative peer influence by monitoring their children's peer groups and encouraging balanced social interactions.

In addition, these findings have implications for the game developers and the policymakers. Game developers could add in features that encourage responsible gaming, such as playtime reminders, usage tracking, and in-game reminders to take breaks. Also, the policymakers could create guidelines or awareness campaigns to educate the public about the risks of excessive gaming and promote the digital well-being among the young people.

Limitations

The present study holds some limitations. Firstly, the study overly relies on self-evaluation assessment, which may lead to response distortions such as faking good and recall inaccuracies. Grimmond et al., (2025) demonstrated that self-report scales are always affected by idiosyncratic response biases, where standard analysis fails to account for fakely adhering to social standards, thus leading to scores that represent social expectations rather than the respondents' true latent state. Additionally, Woodfield, (2026) stated that human information processing may be biased when responding self-report questionnaires, which can be identified as the threat to the validity of results. Participants' responses may not accurately

reflect the truth due to relying on memory recall, as people tend to use general schemas to fill in the gaps of the memory, leading to generalized rather than accurate reports (Johnston et al., 2023).

Secondly, the sample which is not demographically balanced limits the generalizability of the current findings. The participants are predominantly Chinese (91.3%, $n = 136$), this overrepresentation introduces sampling bias and limits the generalisability of the findings to the wider Malaysian population, as the gaming behaviour, peer dynamics, and susceptibility to IGD may be influenced by different cultural backgrounds. In addition, there are 62.5% ($n = 94$) of respondents aged between 18 and 24 years old, which primarily represents the typical age range of university students in Malaysia. This age distribution of the participants overlooks several factors relevant to emerging adults who aged between 25 and 29 years old and start working in Malaysia. For instance, peer influence may function differently in the workplace compared to university settings. Emerging adults who start working may develop more stable coping strategies that affect how impulsivity and peer influence associate with IGD.

Thirdly, cross-sectional research design in the present study is unable to establish causal relationships among self-efficacy, peer influence, impulsivity, and Internet Gaming Disorder (IGD). The study only captures a snapshot of participants' behaviours and psychological states due to the data collected at a single point in time (Wang & Cheng, 2020). Hence, it is not possible to determine the directionality of the relationships observed. For instance, while impulsivity may be associated with higher IGD, it is equally plausible that excessive gaming behaviours may increase impulsive tendencies. Overall, cross-sectional data restrict causal inference due to the absence of temporal sequencing between variables (Taris et al., 2021).

Recommendations

There are a variety of recommendations that can be proposed to make improvements for study in the future. To reduce response biases within self-report scales, multi-method approaches such as combining self-report scales with objective data (e.g., actual gameplay logs, screen-time records) or informant reports (e.g., peers or family members) should be incorporated in the future studies. Research demonstrated that integrating multiple data sources can improve construct validity and effectively reduce common method bias (Smith & Noble, 2025). Furthermore, incorporating positive attribution statements, such as “please answer questions honestly” at the questionnaire serves as a potential recommendation for enhancing the data quality. Vésteinsdóttir et al., (2018) suggested that integrating requests for honesty at the questionnaire increases the participants’ cognitive processing. When the participants are reminded to reflect on their own honesty, they are less likely to engage in social desirability bias, thus reducing the responses biases.

Nevertheless, future research should incorporate more representative sampling techniques to address the demographic imbalance and improve the findings' generalizability. Stratified sampling, which divides the population into smaller groups and randomly selects from each group, can be utilized in future research (Zhang et al., 2022). Future research can separate the population according to age and ethnicity. This can guarantee that groups which might be missed such as Indian and Malay are fairly represented. Besides, future studies should include a broader age range, especially emerging adults aged 25 to 29 who have entered the workplace. This allows for subgroup comparisons between students and working adults, thus providing a more comprehensive understanding of IGD across different life stages.

Additionally, future research is recommended to incorporate longitudinal research design to examine the causation among variables. The reason is due to longitudinal studies

gather data from the same participants over time, which enable researchers to analyze changes in variables over time (Wang & Cheng, 2020). This approach effectively examines directionality of variables, such as impulsivity predicts IGD or excessive gaming behaviors lead to increased impulsivity. Research highlighted that longitudinal designs provide stronger evidence for causal inference and developmental processes (Taris et al., 2021). Thus, incorporating longitudinal designs would improve the validity of the results in subsequent research.

Conclusion

In summary, this study examined the association between self-efficacy, peer influence, and impulsivity on internet gaming disorder among MOBA players in Malaysia using SCT as a guiding framework. The findings demonstrated that the peer influence and impulsivity positively predict IGD whereas self-efficacy negatively predicts IGD. Self-efficacy acting as a protective factor while impulsivity and peer influence increased the risk of problematic gaming, and impulsivity emerging as the strongest predictor. The present study contributes to the literature by providing a more comprehensive understanding of how the cognitive beliefs, behavioural tendencies and social influences interact in the context of MOBA gaming in Malaysia. Also, the study contributes meaningful insights by emphasizing the need for a multidimensional approach in understanding and addressing IGD.

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Appendices

Appendix A

Calculation of Effect Size

Self-Efficacy

$$f^2_{Self - Efficacy} = \frac{R^2}{1 - R^2} = \frac{(-0.30)^2}{1 - (-0.30)^2} = 0.0989$$

Zhang, Y., Liang, T., Xiong, G., Zheng, X., Li, H., & Zhang, J. (2022). Social self-efficacy and Internet gaming disorder among Chinese undergraduates: The mediating role of Alexithymia and the moderating role of empathy. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.898554>

Variables	M	SD	1	2	3	4	5	6	7
1 Gender	–	–	1						
2 Grade	–	–	0.34**	1					
3 Time spending on online game per day	2.53	2.37	–0.11**	–0.03	1				
4 Social self-efficacy	3.20	0.74	–0.34	0.07	–0.14**	1			
5 Alexithymia	2.93	0.47	–0.05	–0.07**	0.17**	–0.43**	1		
6 Empathy	2.58	0.47	0.02	0.02	–0.1**	0.24**	–0.43**	1	
7 IGD	2.57	0.94	–0.27**	–0.13**	0.43**	–0.30**	0.35**	–0.21**	1

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Peer Influence

$$f^2_{Peer\ Influence} = \frac{R^2}{1 - R^2} = \frac{(0.42)^2}{1 - (0.42)^2} = 0.2142$$

Yu, Y., Mo, P. K.-H., Zhang, J., Li, J., & Lau, J. T.-F. (2021). Impulsivity, self-control, interpersonal influences, and maladaptive cognitions as factors of Internet gaming disorder among adolescents in China: Cross-sectional Mediation Study. *Journal of Medical Internet Research*, 23(10).
<https://doi.org/10.2196/26810>

Table 3. Correlations among impulsivity, self-control, interpersonal influences, maladaptive cognitions, and internet gaming disorder (N=3081)^a.

Major variable	1	2	3	4
1. Impulsivity ^b	— ^c			
2. Self-control	0.58*	—		
3. Parental influences ^b	0.26*	0.24*	—	
4. Peer influences ^b	0.24*	0.21*	0.40*	—
5. Overall maladaptive cognitions ^b	0.37*	0.38*	0.30*	0.35*
6. Perceived rewards of internet gaming ^b	0.31*	0.32*	0.29*	0.37*
7. Perceived urges for playing internet games ^b	0.39*	0.45*	0.28*	0.35*
8. Perceived unwillingness to stop playing without completion of gaming tasks ^b	0.28*	0.27*	0.19*	0.30*
9. IGD ^{d,e}	0.30*	0.41*	0.37*	0.42*

Impulsivity

$$f^2_{Impulsivity} = \frac{R^2}{1 - R^2} = \frac{(0.30)^2}{1 - (0.30)^2} = 0.0989$$

Yu, Y., Mo, P. K.-H., Zhang, J., Li, J., & Lau, J. T.-F. (2021). Impulsivity, self-control, interpersonal influences, and maladaptive cognitions as factors of Internet gaming disorder among adolescents in China: Cross-sectional mediation study. *Journal of Medical Internet Research*, 23(10).
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Table 3. Correlations among impulsivity, self-control, interpersonal influences, maladaptive cognitions, and internet gaming disorder (N=3081)^a.

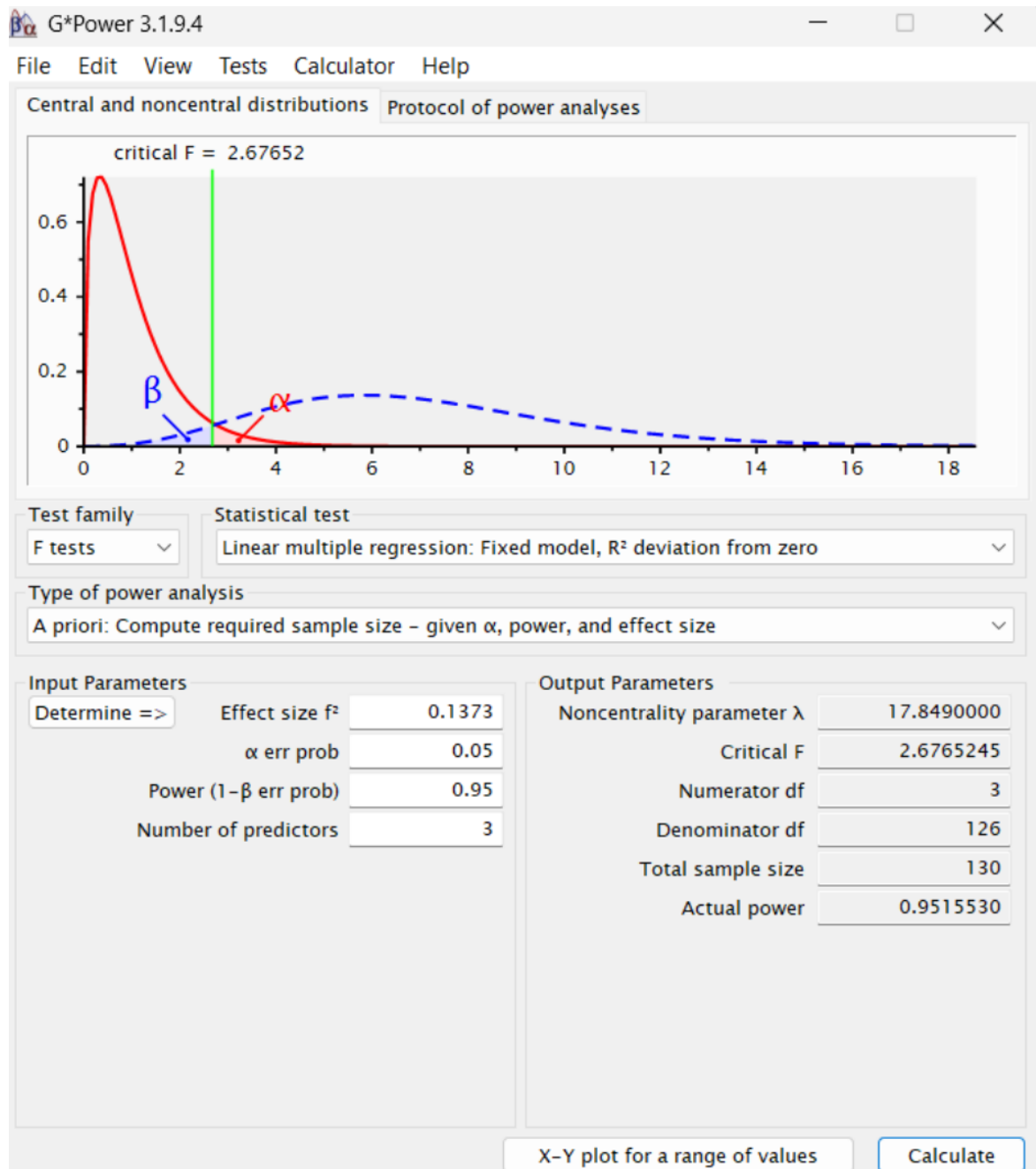
Major variable	1	2	3	4
1. Impulsivity ^b	— ^c			
2. Self-control	0.58*	—		
3. Parental influences ^b	0.26*	0.24*	—	
4. Peer influences ^b	0.24*	0.21*	0.40*	—
5. Overall maladaptive cognitions ^b	0.37*	0.38*	0.30*	0.39
6. Perceived rewards of internet gaming ^b	0.31*	0.32*	0.29*	0.37
7. Perceived urges for playing internet games ^b	0.39*	0.45*	0.28*	0.35
8. Perceived unwillingness to stop playing without completion of gaming tasks ^b	0.28*	0.27*	0.19*	0.30
9. IGD ^{d,e}	0.30*	0.41*	0.37*	0.42

Total effect size

$$f^2 = \frac{0.0989 + 0.2142 + 0.0989}{3} = 0.1373$$

Appendix B

Calculation of Sample Size using G*Power



Appendix C

Questionnaires

Final Year Project

Department of Psychology and Counseling
Faculty of Arts and Social Science
Universiti Tunku Abdul Rahman

Introduction

We would like to conduct a research study to Examine the Associations between Self-Efficacy, Peer Influence, and Impulsivity on Internet Gaming Disorder Among Emerging Adult Multiplayer Online Battle Arena Players in Malaysia.

Procedures and Confidentiality

The following questionnaire will take approximately 6 minutes to complete. All information provided will remain private and confidential. The information given will only be reported as group data with no identifying information, will only be used for academic purposes, and potentially will be used to publish in a scholarly journal as research outcomes.

Eligibility Criteria for Participants

We are looking for individuals who fulfil the following criteria:

1. Aged between 18 and 29 years old.
2. Currently resided in Malaysia.
3. Engaged in Multiplayer Online battle Arena (MOBA) games (e.g., Mobile Legends: Bang Bang (MLBB), Dota 2, League of Legends, Honors of King, Pokémon Unite).

Incentives

The **first 100 valid respondents will receive RM5** (Touch 'n Go eWallet).

Level of Risk

There are no known risks associated with this study. The UTAR Scientific Ethics Research Committee has approved this research (Ref no: U/SERC/78-685/2026).

Participation

All the information gathered will remain anonymous and confidential. Your information will not be disclosed to any unauthorized person and will be accessible only to group members. Participation in this study is voluntary. Some questions in the questionnaire may be sensitive or make you uncomfortable. However, you are free to withdraw with consent and discontinue participation at any time without prejudice. Your responses will be coded numerically in the research assignment for the research interpretation. Your cooperation would be greatly appreciated.

If you choose to participate in this project, please answer all the questions honestly and return the completed questionnaire promptly.

Personal Data Protection Statement

Please be informed that in accordance with Personal Data Protection Act 2010 ("PDPA") which came into force on 15 November 2013, Universiti Tunku Abdul Rahman ("UTAR") is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

1. Personal data refers to any information which may directly or indirectly identify a person which could include sensitive personal data and expression of opinion. Among others it includes:

- a) Name
- b) Identity card
- c) Place of Birth
- d) Address
- e) Education History
- f) Employment History
- g) Medical History
- h) Blood type
- i) Race
- j) Religion
- k) Photo
- l) Personal information and Association Research Data

2. The purposes for which your personal data may be used are inclusive but not limited to:-

- a) For assessment of any application to UTAR
- b) For processing any benefits and services
- c) For communication purposes
- d) For advertorial and news
- e) For general administration and record purposes
- f) For enhancing the value of education
- g) For educational and related purposes consequential to UTAR
- h) For replying any responds to compliants and enquiries
- i) For the purpose of our corporate governance
- j) For the purposes of conducting research/ collaboration

3. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

4. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

5. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

6. By submitting or providing your personal data to UTAR, you had consented and agreed for your personal data to be used in accordance to the terms and conditions in the Notice and our relevant policy.

7. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.

8. You may access and update your personal data by writing to us at:

CHAN ZI YUAN (ziyuan.chan2003@1utar.my)

LIM WEN YAN (wennyann0022@1utar.my)

TAN YUN LIN (yunlin.t@1utar.my)

1. Acknowledgment of Notice *

- ☐ I have been notified by you and that I hereby understood, consented and agreed per UTAR above notice.
- ☐ I disagree, my personal data will not be proceed.

Appendix D

Ethical Clearance Approval



UNIVERSITI TUNKU ABDUL RAHMAN DU012(A)
Wholly owned by UTAR Education Foundation Co. No. 578227-M

Re: U/SERC/78-685/2026

15 January 2026

Dr Lee Wan Ying
Head, Department of Psychology and Counselling
Faculty of Arts and Social Science
Universiti Tunku Abdul Rahman
Jalan Universiti, Bandar Baru Barat
31900 Kampar, Perak.

Dear Dr Lee,

Ethical Approval For Research Project/Protocol

We refer to the application for ethical approval for your students' research project from Bachelor of Social Science (Honours) Psychology programme enrolled in course UAPZ3013. We are pleased to inform you that the application has been approved under Expedited Review.

The details of the research projects are as follows:

No	Research Title	Student's Name	Supervisor's Name	Approval Validity
1.	Academic stress, loneliness, and social anxiety as predictors of social media addiction among university students in Malaysia	1. Lim Le Yee 2. Cheah Yi Thong	Dr T'ng Soo Ting	15 January 2026 – 14 January 2027
2.	The Relationship Between Self-oriented Perfectionism, Self-determination, and Academic Procrastination Among Undergraduate Students in Malaysia	1. Chan Yan Leng 2. Liang Yi Qing 3. Ng Ting Shuen	Dr Siah Poh Chua	
3.	The Relationship Between Coping Strategies, Self-Control and Sleep Quality Among University Students in Malaysia	1. Lee Kell Win 2. Lim Say Khai		
4.	Resilience, Self-efficacy, and Perceived Social Support as Predictors of Coping Strategies Among Young Adults in Malaysia	1. Chong Chee Hui 2. Lian Jin Yee 3. Teo Yi Jing	Ms Teoh Xi Yao	
5.	Sleep Quality, Resilience, and Social Support as Predictors of Mental Well-being Among Undergraduate Students in Malaysia	1. Lai Li Yen 2. Teh Wen Yi	Ms Choo Hui Juin	
6.	Self-efficacy, Intolerance of Uncertainty, and Procrastination as Predictors of Future Anxiety Among University Students in Malaysia	1. Chon Hui En 2. Liew Jun Wei 3. Then Siang Ying		
7.	A Study on Peer Pressure and Parenting Style as Predictors of Self-Esteem Among University Students in Malaysia	1. Chen Jing Yi 2. Foe Yu Xian 3. Sebastian Lin Xu Ze	Ms Sanggari a/p Krishnan	
8.	Relationship Between Self-esteem, Academic Stress and Depression Among Undergraduate Students in Malaysia	1. Lee Seen Yi 2. Tang Jing Deeng 3. Timmy Looi Tian Ming	Dr Ooh Seow Ling	
9.	The Influence of Mindfulness and Sleep Quality in Stress Among University Students in Malaysia	1. Chung Rui Qi 2. Olivia Ho Yui Ying		

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Tel: (603) 9086 0288 Fax: (603) 9019 8888
Website: www.utar.edu.my



No	Research Title	Student's Name	Supervisor's Name	Approval Validity
10.	Predictive Roles of Rejection Sensitivity, Maladaptive Perfectionism and Rumination on Depression Among University Students in Malaysia	1. Hu Xiu Jing 2. Jean Chai Wan Ying 3. Sophia Kong Ke Ying	Dr T'ng Soo Ting	15 January 2026 – 14 January 2027
11.	The Predictors of Impulsive Buying of Youth in Malaysia	1. Khaw Jing Chun 2. Ong Chee Seng 3. Phang Wen Jun 4. Li Zihao 5. Tan Woon Yu	Mr Lim Ooi Sheng	
12.	Online Shopping Addiction, Perceived Social Support, Social Media Usage as Predictors of Life Satisfaction Among Young Adults in Malaysia	1. Chin Yi Ying 2. Katherine Lim Meam 3. Mak Wen Xuan	Dr Nurul Inan Binti Abdul Jalil	
13.	Relationship Between Self-Control, Perceived Social Support, and Internet Addiction with Cyberbullying	1. Mandy Ooi Wen Min 2. Tay Xu Chi 3. Yip Jun Kit	Dr Ooh Seow Ling	
14.	The Relationship Between Attachment Styles, Conflict Resolution Strategies, and Romantic Relationship Satisfaction Among Young Adults	1. Shirley Chew Mei Yee 2. Yeoh Jim Min	Dr Au Zher Wen	
15.	Red Pill Ideology as a Mechanism Linking Gender Norms to Relationship Cynicism: The Buffering Effect of Egalitarian Orientation	1. Ally Tan Sze Man 2. Tan Xin Jie 3. Zoe Ong Jia Jing	Dr Au Zher Wen	
16.	The Relationship Between Violent Game Exposure, Trait Aggression, and Conflict-resolution Styles Among University Students in Malaysia	1. Goh Zhu Yan 2. Soo Jing Xiang 3. Tee Yu Yang	Dr Ooh Seow Ling	
17.	The Influence of Instagram Use on Body Image Among Gen Z: The Mediating Role of Social Comparison	1. Chua Xiao Qiong 2. Elaze Ng Yong Xuan 3. Wong Yong Sing	Dr Lee Wan Ying	
18.	Shyness, Social Media Use, and Neuroticism as Predictors of Cyberbullying Victimization Among Young Adults in Malaysia	1. Chung Xin Rou 2. Priyadarini a/p Gunalan 3. Soh Jing Wen	Dr T'ng Soo Ting	
19.	Examine the Associations Between Self-efficacy, Peer Influence, and Impulsivity on Internet Gaming Disorder Among Emerging Adult Multiplayer Online Battle Arena (MOBA) Players in Malaysia	1. Chan Zi Yuan 2. Lim Wen Yan 3. Tan Yun Lin	Ms Tee Geok Hong	
20.	Examining the Role of Gaming Addiction and Perceived Stress on Aggressive Behaviour Among Young Adults in Malaysia	1. Jeston Lee Tze Xiang 2. Khor Ming 3. Ooi Phey Joo	Dr Tan Soon Ann	
21.	The Relationship Between Mental Health Literacy, Mental Health Stigma and Barriers to Seeking Mental Health Support Among Young Adults in Malaysia	1. Kam Yee Ching 2. Tang Kar Zhan 3. Yong Si Xian	Mr Tay Kek Wai	
22.	Association Between Parental Marital Conflict-resolution, Romantic Relationship Self-efficacy, and Attitudes Toward Singlehood Among Malaysian Emerging Adults	1. Kristin Ong Kai Tzu 2. Wonard Primus Kayau	Dr Gan Su Wan	
23.	Visualizing the Future Self and Its Effect on Future Self-Continuity and Intention to Be Single: An Experimental Study	1. Hoon Xin Yi 2. Joanne Ooi Rou Yan		
24.	Future Self Continuity and Lying-flat Tendency Among Undergraduate Students in Malaysia: The Mediating Role of Grit	1. Chan Lee Yi 2. Ho Si Qing 3. Tan Quan Yine		
25.	Loneliness and Depression as Predictors of Barriers to Help-seeking for Mental Health Among Malaysian University Students	1. Keong Pei Wen 2. Sip Chern Huan 3. Tey Sen Sui		
26.	Mental Health Literacy and Attitudes Toward Seeking Professional Psychology Help Among Malaysian University Students	1. Lim Sheng Xun 2. Gan Boon Quan 3. Veyron Chua Rui Yuan		
27.	The Mediating Role of Fear of Intimacy Between Parental Psychological Control and Romantic Relationship Among Malaysian Emerging Adults	1. See E Yann 2. Yan Jia Li 3. Tan Yee En		

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Website: www.utm.edu.my



No	Research Title	Student's Name	Supervisor's Name	Approval Validity
28.	Insecure Attachment, Relationship Commitment and Relationship Satisfaction as Predictors of Ghosting Behaviour in Romantic Relationships Among Emerging Adults in Malaysia	1. Gajendra Singam a/l Dorasingam 2. Harshini a/p Subramaniam 3. Lo Xin Yi	Dr Gan Su Wan	15 January 2026 – 14 January 2027
29.	The Relationship Between Family Cohesion, Nature Exposure, Digital Literacy, and Psychological Well-being of Malaysian Older Adults	1. Annissa Cheong Ce Yan 2. Chan Yee Xuan 3. Yap Yan Tong	Dr Sarvarubini Nainee	

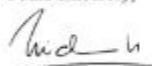
The conduct of this research is subject to the following:

- (1) The participants' informed consent be obtained prior to the commencement of the research;
- (2) Confidentiality of participants' personal data must be maintained; and
- (3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.
- (4) Written consent be obtained from the institution(s)/company(ies) in which the physical or/and online survey will be carried out, prior to the commencement of the research.

Should the students collect personal data of participants in their studies, please have the participants sign the attached Personal Data Protection Statement for records.

Thank you.

Yours sincerely,



Professor Dr Zuraidah Abd Manaf
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Arts and Social Science



Appendix E

Reliability of Instrument in Pilot Study

Internet Gaming Disorder Scale 9-Short-Form (IGDS9-SF)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.899	.899	9

New General Self-Efficacy Scale (NGSES)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.906	.907	8

Impulsive Behaviour Short Scale – 8

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.766	.764	8

Peer Influence on Internet Gaming Addiction Scale

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.752	.751	6

Appendix F

Reliability of Instrument in Actual Study

Internet Gaming Disorder

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.929	.929	9

Self-Efficacy

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.945	.945	8

Impulsivity

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.717	.722	8

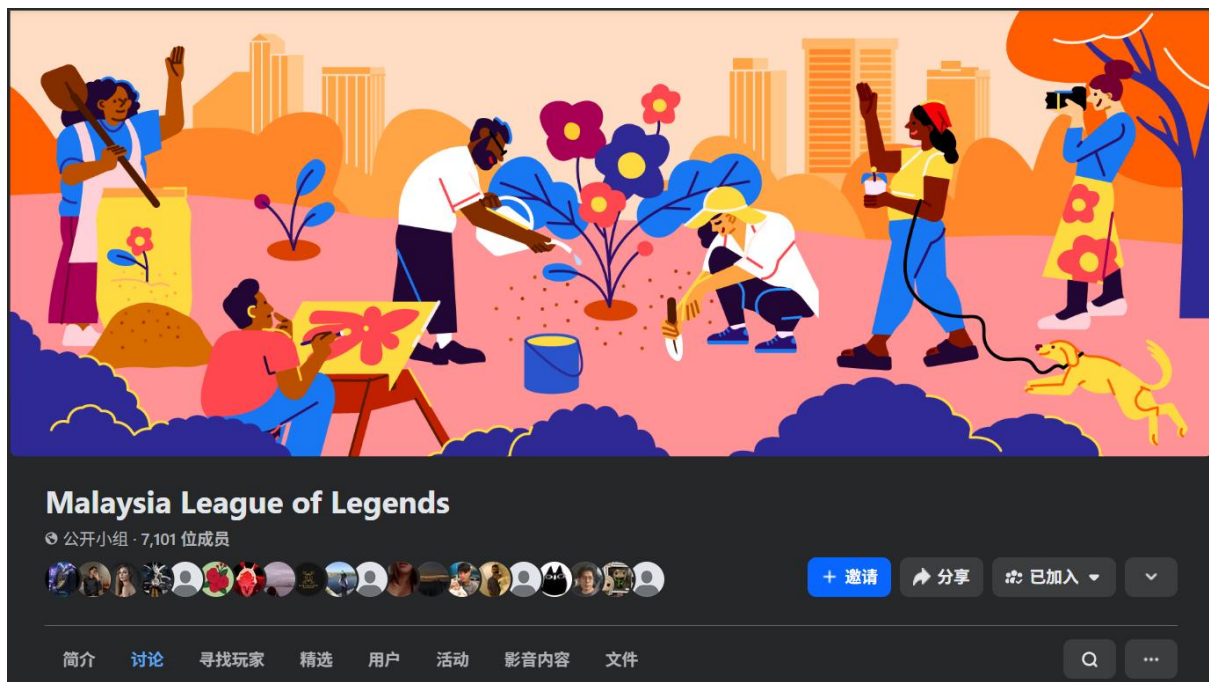
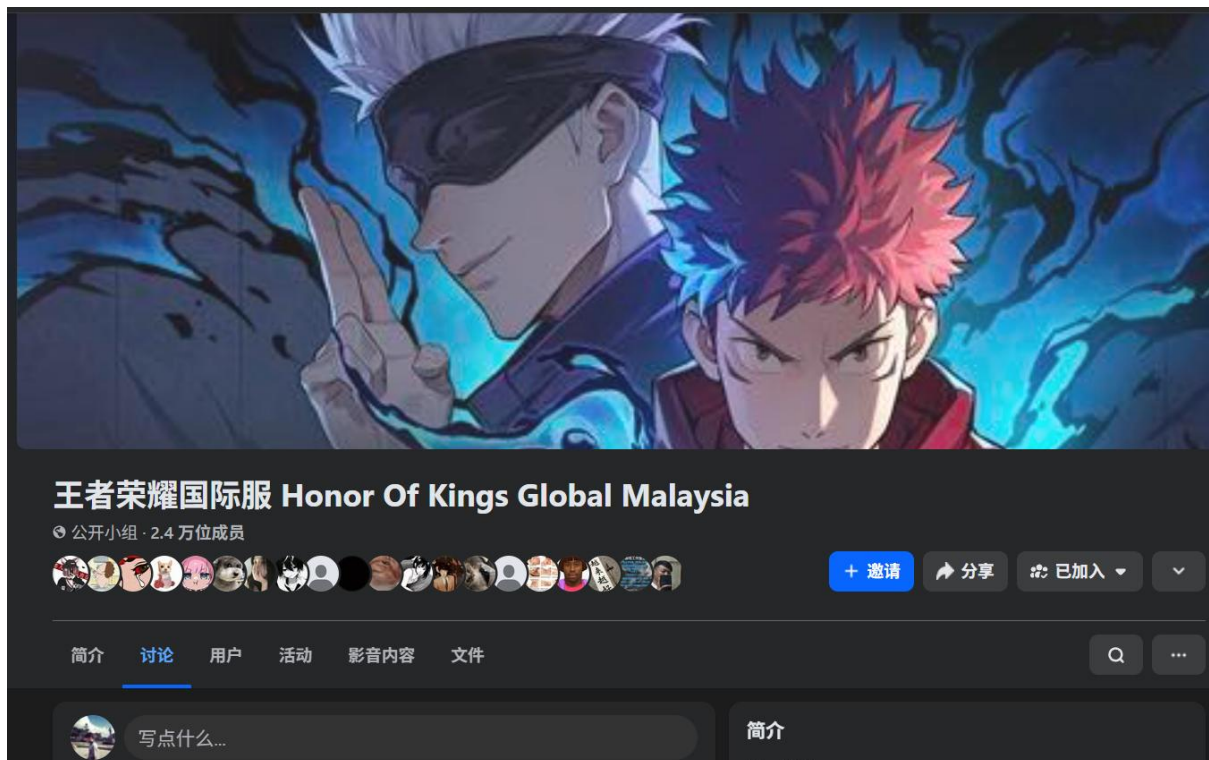
Peer Influence

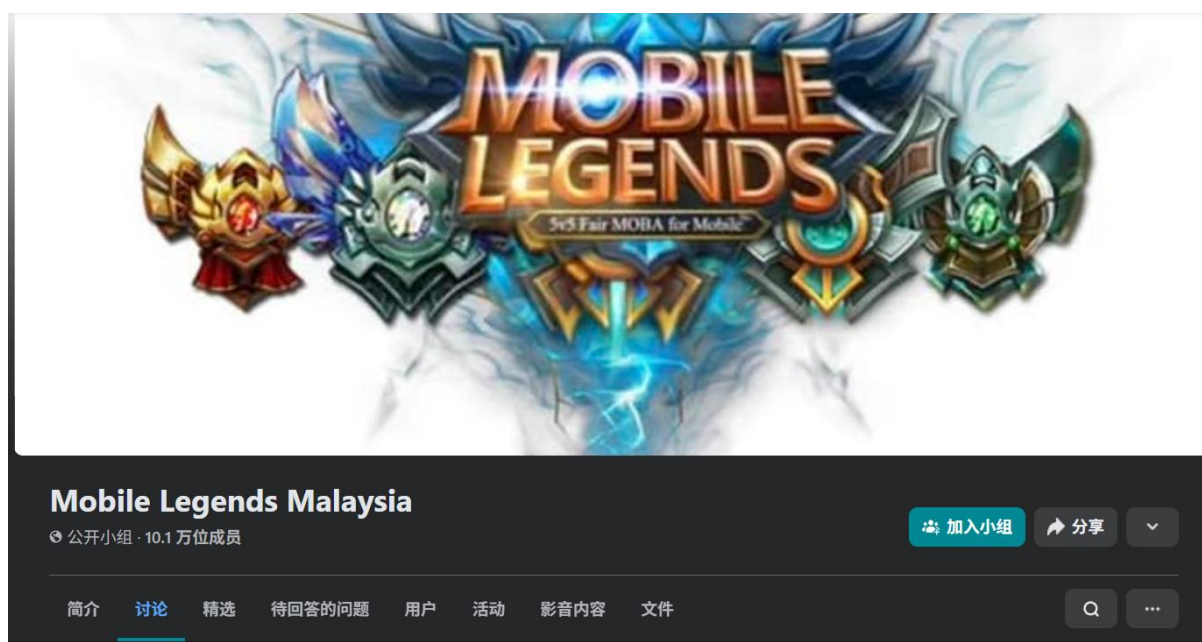
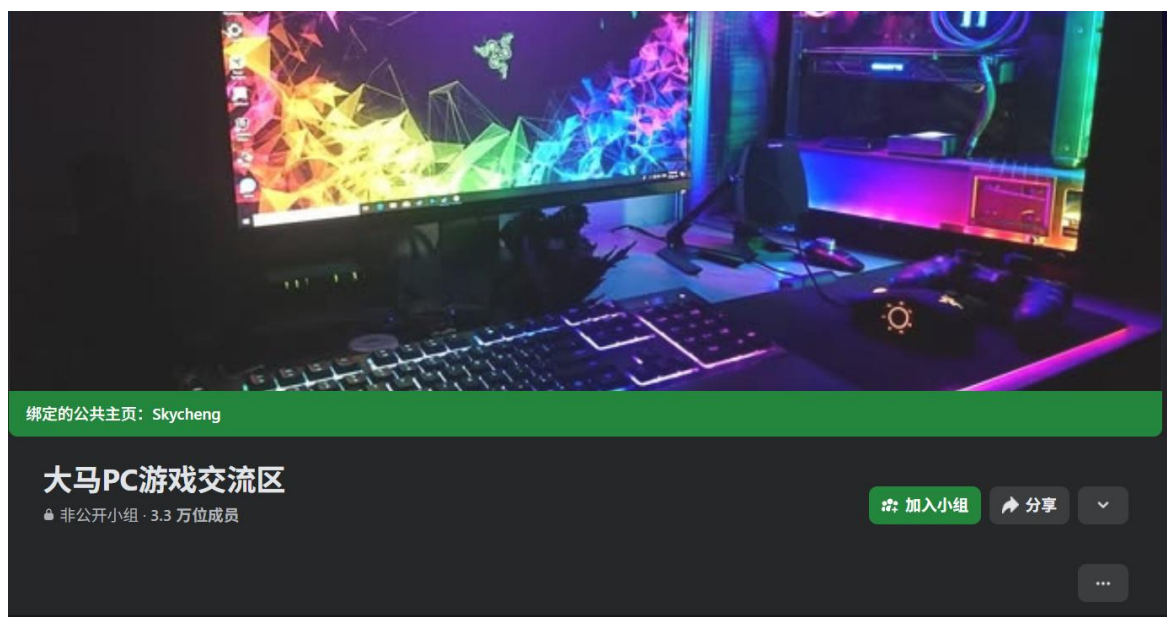
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.766	.757	6

Appendix G

Examples of Gaming Groups in Facebook and Discord



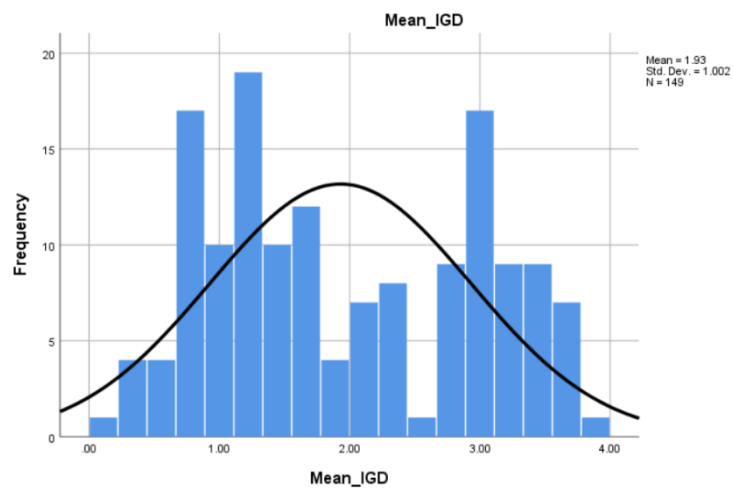




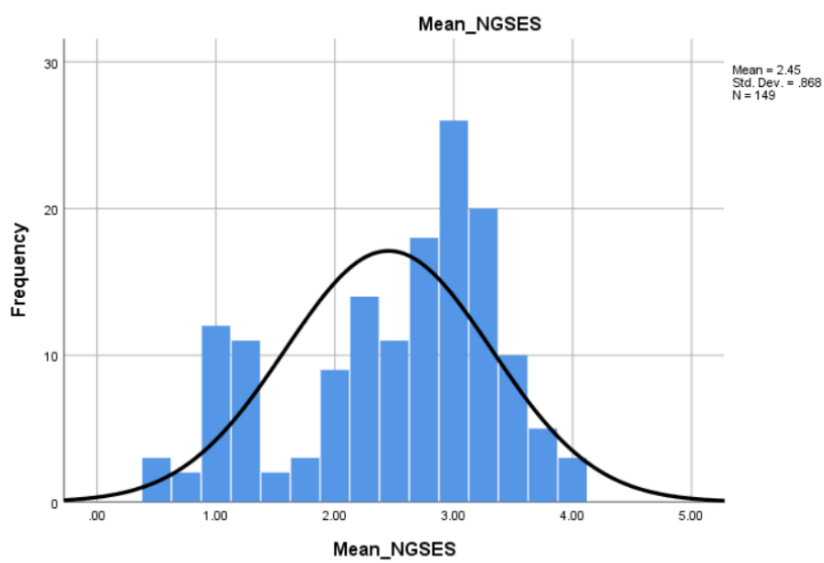
Appendix H

Histogram

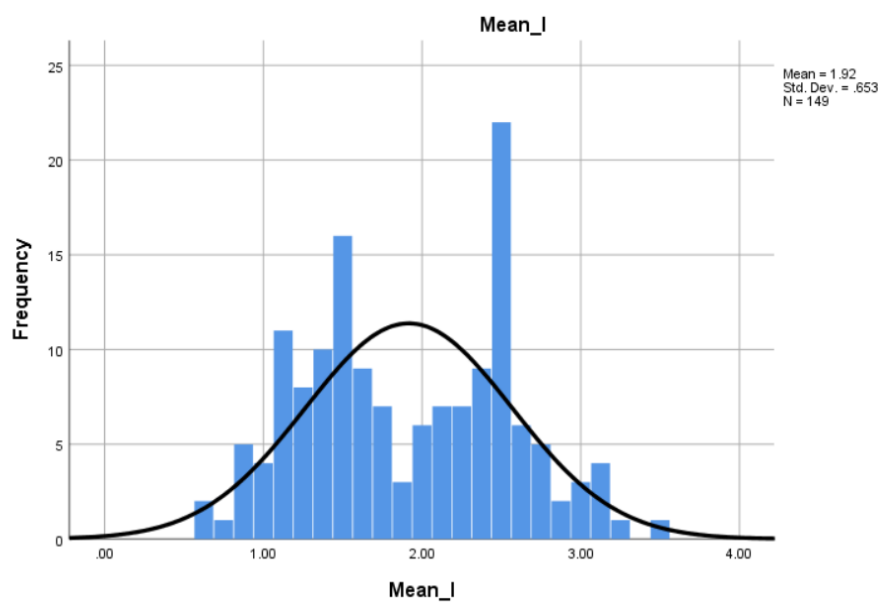
Internet Gaming Disorder



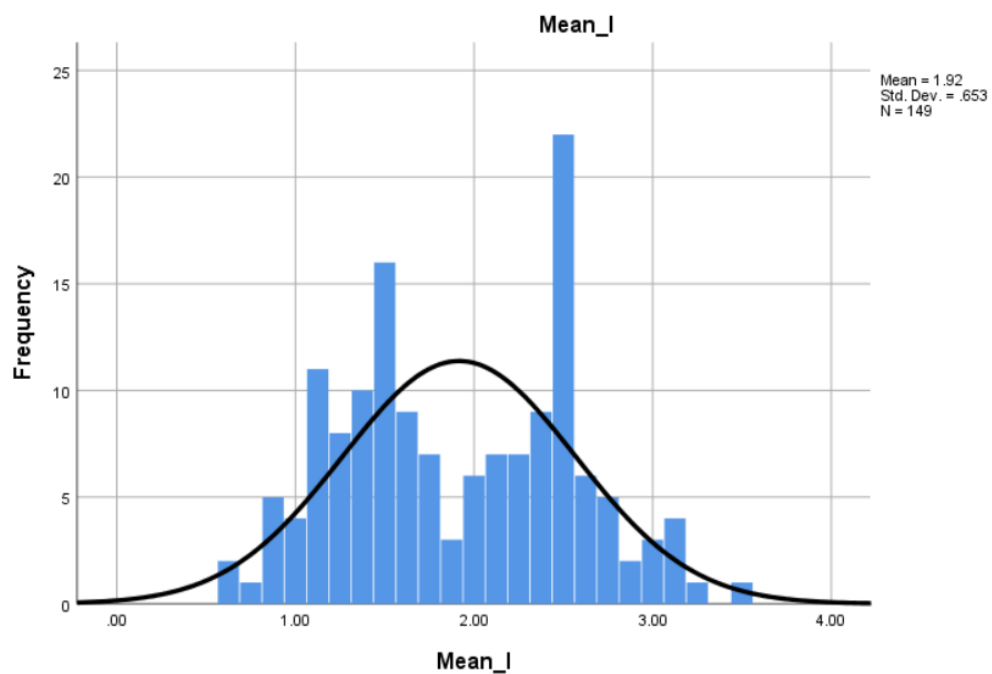
Self-Efficacy



Impulsivity



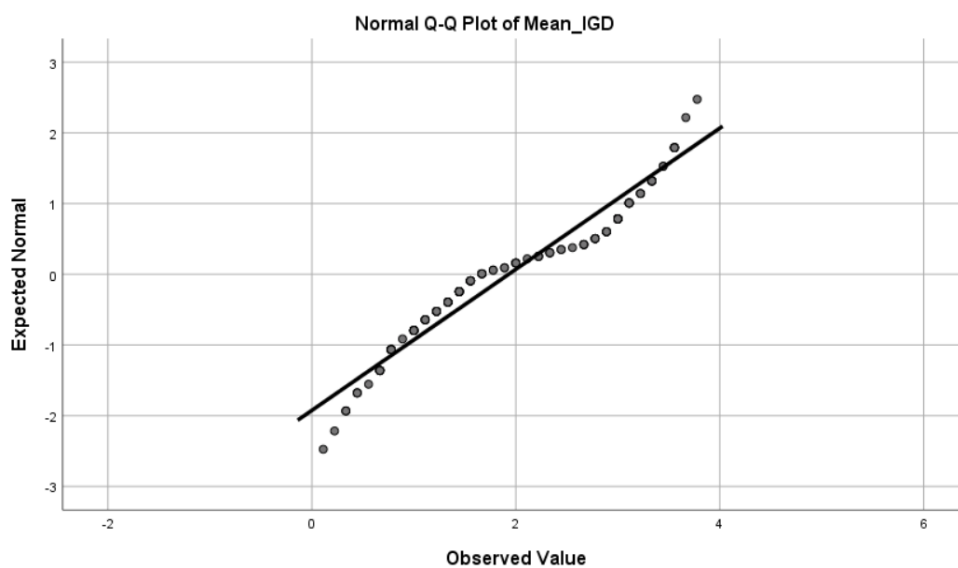
Peer Influence



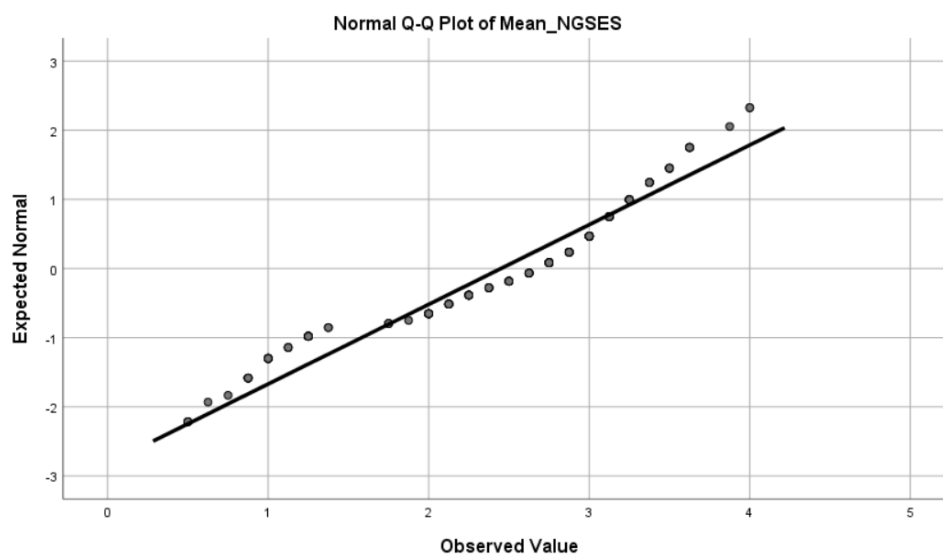
Appendix I

Quantile-Quantile Plot

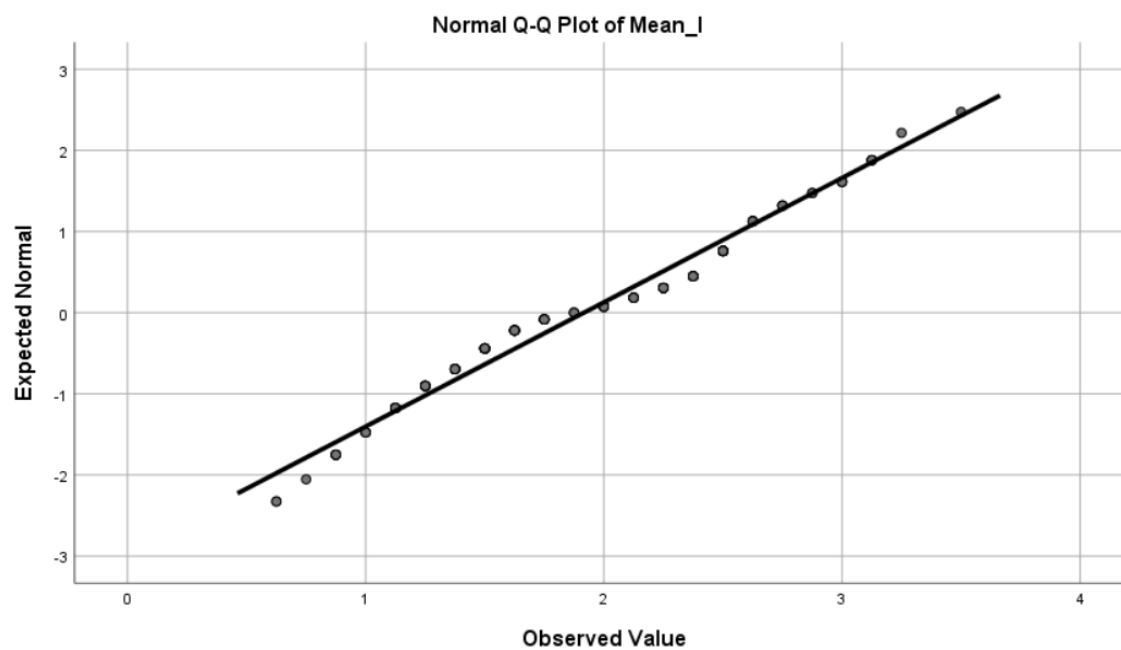
Internet Gaming Disorder



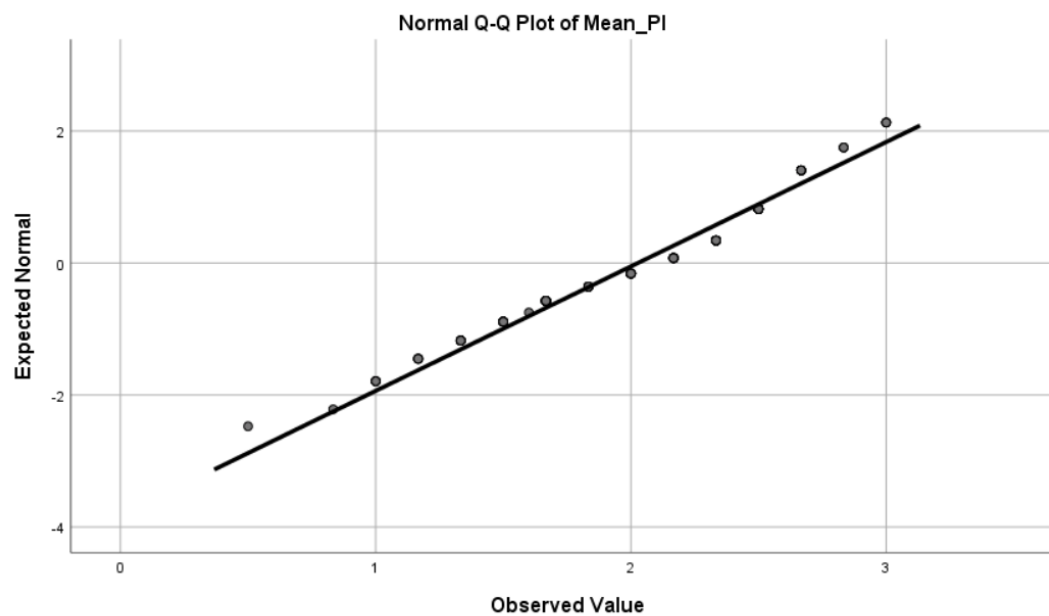
Self-Efficacy



Impulsivity



Peer Influence



Appendix J

Skewness and Kurtosis

Internet Gaming Disorder

Descriptives

			Statistic	Std. Error
Mean_IGD	Mean		1.9292	.08212
	95% Confidence Interval for Mean	Lower Bound	1.7669	
		Upper Bound	2.0914	
	5% Trimmed Mean		1.9254	
	Median		1.6667	
	Variance		1.005	
	Std. Deviation		1.00243	
	Minimum		.11	
	Maximum		3.78	
	Range		3.67	
	Interquartile Range		1.89	
	Skewness		.157	.199
	Kurtosis		-1.315	.395

Self-Efficacy

Mean_NGSES	Mean		2.4505	.07112
	95% Confidence Interval for Mean	Lower Bound	2.3100	
		Upper Bound	2.5910	
	5% Trimmed Mean		2.4765	
	Median		2.7500	
	Variance		.754	
	Std. Deviation		.86807	
	Minimum		.50	
	Maximum		4.00	
	Range		3.50	
	Interquartile Range		1.13	
	Skewness		-.628	.199
	Kurtosis		-.590	.395

Impulsivity

Mean_I	Mean		1.9161	.05348
	95% Confidence Interval for Mean	Lower Bound	1.8104	
		Upper Bound	2.0218	
	5% Trimmed Mean		1.9091	
	Median		1.8750	
	Variance		.426	
	Std. Deviation		.65283	
	Minimum		.63	
	Maximum		3.50	
	Range		2.88	
	Interquartile Range		1.13	
	Skewness		.103	.199
	Kurtosis		-.962	.395

Peer Influence

Mean_PI	Mean		2.0275	.04345
	95% Confidence Interval for Mean	Lower Bound	1.9417	
		Upper Bound	2.1134	
	5% Trimmed Mean		2.0404	
	Median		2.1667	
	Variance		.281	
	Std. Deviation		.53037	
	Minimum		.50	
	Maximum		3.00	
	Range		2.50	
	Interquartile Range		.83	
	Skewness		-.424	.199
	Kurtosis		-.560	.395

Appendix K

Test of Normality

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Mean_IGD	.135	149	.000	.935	149	.000
Mean_NGSES	.138	149	.000	.930	149	.000
Mean_I	.121	149	.000	.964	149	.001
Mean_PI	.147	149	.000	.957	149	.000

a. Lilliefors Significance Correction

Appendix L

Descriptive Statistics

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18	1	.7	.7	.7
	19	5	3.4	3.4	4.0
	20	15	10.1	10.1	14.1
	21	22	14.8	14.8	28.9
	22	27	18.1	18.1	47.0
	23	19	12.8	12.8	59.7
	24	25	16.8	16.8	76.5
	25	19	12.8	12.8	89.3
	26	5	3.4	3.4	92.6
	27	4	2.7	2.7	95.3
	28	4	2.7	2.7	98.0
	29	3	2.0	2.0	100.0
	Total	149	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	80	53.7	53.7	53.7
	2	67	45.0	45.0	98.7
	4	2	1.3	1.3	100.0
	Total	149	100.0	100.0	

Race

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	136	91.3	91.3	91.3
	2	7	4.7	4.7	96.0
	3	5	3.4	3.4	99.3
	4	1	.7	.7	100.0
	Total	149	100.0	100.0	

Have you been playing MOBA games (e.g., Mobile Legend, Dota 2, Honor of King) for at least 1 year?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	149	100.0	100.0	100.0

How many years have you been playing MOBA games?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	31	20.8	20.8	20.8
	2	26	17.4	17.4	38.3
	3	74	49.7	49.7	87.9
	4	18	12.1	12.1	100.0
	Total	149	100.0	100.0	

How frequently do you play MOBA games?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	19	12.8	12.8	12.8
	2	44	29.5	29.5	42.3
	3	49	32.9	32.9	75.2
	4	37	24.8	24.8	100.0
	Total	149	100.0	100.0	

How many hours do you spend playing MOBA games each day?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	7.4	7.4	7.4
	2	82	55.0	55.0	62.4
	3	40	26.8	26.8	89.3
	4	13	8.7	8.7	98.0
	5	3	2.0	2.0	100.0
	Total	149	100.0	100.0	

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Mean_IGD	149	.11	3.78	287.44	1.9292	1.00243	1.005
Mean_NGSES	149	.50	4.00	365.13	2.4505	.86807	.754
Mean_I	149	.63	3.50	285.50	1.9161	.65283	.426
Mean_PI	149	.50	3.00	302.10	2.0275	.53037	.281
Valid N (listwise)	149						

Appendix M

Multiple Linear Regression Assumptions

Model Summary Table

Model Summary ^b										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change	Durbin-Watson
1	.756 ^a	.571	.562	.66339	.571	64.312	3	145	.000	2.099

a. Predictors: (Constant), Mean_PI, Mean_NGSES, Mean_I

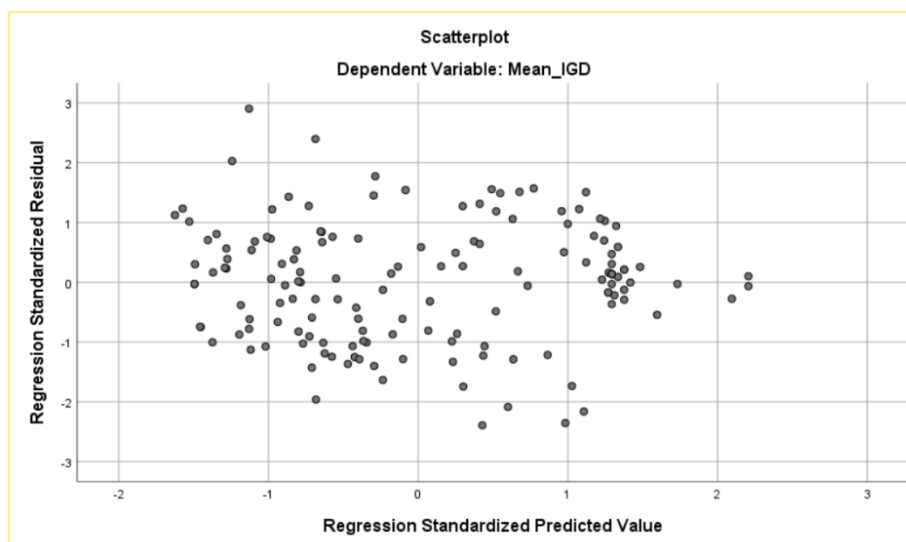
b. Dependent Variable: Mean_IGD

Coefficient Tables

Coefficients ^a											
Model	Unstandardized Coefficients			Standardized Coefficients		Sig.	Correlations			Collinearity Statistics	
	B	Std. Error		Beta	t		Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.160	.299		.537	.592					
	Mean_NGSES	-.251	.064	-.217	-3.914	.000	-.350	-.309	-.213	.962	1.039
	Mean_I	.896	.096	.584	9.370	.000	.707	.614	.510	.762	1.312
	Mean_PI	.328	.117	.174	2.818	.006	.475	.228	.153	.779	1.284

a. Dependent Variable: Mean_IGD

Scatterplot



Casewise Summaries

Case Summaries				
	Case Number	Mahalanobis Distance	Cook's Distance	Centered Leverage Value
1	1	12.00089	.00657	.07895
2	2	10.16406	.01064	.06687
3	3	9.22309	.10669	.06068
4	4	8.32472	.00102	.05477
5	5	7.82987	.02448	.05151
6	6	7.65013	.00046	.05033
7	7	7.14153	.05651	.04698
8	8	6.99787	.00493	.04604
9	9	6.97745	.00099	.04590
10	10	6.93479	.00681	.04562
11	11	6.82590	.00012	.04491
12	12	6.82590	.00008	.04491
13	13	6.46583	.02681	.04254
14	14	6.39255	.01689	.04206
15	15	6.39103	.00020	.04205
16	16	6.39103	.00020	.04205
17	17	6.04217	.01437	.03975
18	18	5.66837	.00463	.03729
19	19	5.63276	.01686	.03706
20	20	5.59488	.01060	.03681
21	21	5.58660	.00723	.03675
22	22	5.16506	.01648	.03398
23	23	4.84123	.02571	.03185
24	24	4.73902	.00257	.03118
25	25	4.73902	.00030	.03118
26	26	4.27209	.00071	.02811
27	27	3.97702	.00023	.02616
28	28	3.97276	.00282	.02614

29	29	3.85288	.00002	.02535
30	30	3.84323	.00151	.02528
31	31	3.79202	.00123	.02495
32	32	3.76372	.00041	.02476
33	33	3.76372	.00041	.02476
34	34	3.76051	.00059	.02474
35	35	3.71387	.00245	.02443
36	36	3.63912	.00919	.02394
37	37	3.63493	.00014	.02391
38	38	3.60476	.00000	.02372
39	39	3.58158	.01343	.02356
40	40	3.57097	.01090	.02349
41	41	3.56033	.00438	.02342
42	42	3.55530	.00749	.02339
43	43	3.45228	.00096	.02271
44	44	3.42061	.01933	.02250
45	45	3.39179	.00080	.02231
46	46	3.39179	.00023	.02231
47	47	3.39179	.00023	.02231
48	48	3.39179	.00019	.02231
49	49	3.30578	.02144	.02175
50	50	3.29660	.00000	.02169
51	51	3.28515	.00591	.02161
52	52	3.28104	.00279	.02159
53	53	3.27904	.00003	.02157
54	54	3.27036	.01332	.02152
55	55	3.26826	.00085	.02150
56	56	3.24194	.00853	.02133
57	57	3.20596	.00805	.02109
58	58	3.15910	.00041	.02078
59	59	2.97725	.02690	.01959

60	60	2.97193	.00003	.01955
61	61	2.97193	.00215	.01955
62	62	2.90317	.00065	.01910
63	63	2.89561	.00802	.01905
64	64	2.86218	.01709	.01883
65	65	2.82929	.01661	.01861

91	91	2.31731	.00901	.01525
92	92	2.25535	.01571	.01484
93	93	2.25390	.00067	.01483
94	94	2.23064	.00442	.01468
95	95	2.17286	.00348	.01430
96	96	2.17029	.00040	.01428
97	97	2.14331	.00705	.01410
98	98	2.11534	.00722	.01392
99	99	2.08552	.00009	.01372
100	100	2.02316	.00343	.01331
101	101	2.00977	.04185	.01322
102	102	2.00977	.00323	.01322
103	103	1.97523	.00042	.01299
104	104	1.91618	.00254	.01261
105	105	1.85542	.00122	.01221
106	106	1.85424	.00310	.01220
107	107	1.83855	.00077	.01210
108	108	1.81734	.00038	.01196
109	109	1.80692	.00276	.01189
110	110	1.79722	.00209	.01182
111	111	1.78087	.00736	.01172
112	112	1.71518	.00375	.01128
113	113	1.71511	.00001	.01128
114	114	1.70986	.00860	.01125
115	115	1.69473	.00526	.01115
116	116	1.67556	.00065	.01102
117	117	1.55645	.00229	.01024
118	118	1.55645	.00837	.01024
119	119	1.52246	.00001	.01002
120	120	1.43477	.00813	.00944
121	121	1.39202	.00214	.00916
122	122	1.36016	.00015	.00895

123	123	1.30851	.00144	.00861
124	124	1.26437	.00003	.00832
125	125	1.26307	.00422	.00831
126	126	1.21313	.00218	.00798
127	127	1.20605	.00874	.00793
128	128	1.19901	.00362	.00789
129	129	1.17113	.00600	.00770
130	130	.93489	.00111	.00615
131	131	.91666	.00329	.00603
132	132	.90712	.00491	.00597
133	133	.87744	.00437	.00577
134	134	.87454	.00001	.00575
135	135	.85846	.00641	.00565
136	136	.83540	.00617	.00550
137	137	.83482	.00014	.00549
138	138	.80568	.01724	.00530
139	139	.80568	.00022	.00530
140	140	.80124	.00079	.00527
141	141	.72300	.01047	.00476
142	142	.71122	.00222	.00468
143	143	.67572	.00465	.00445
144	144	.61532	.00320	.00405
145	145	.57037	.01409	.00375
146	146	.49928	.00775	.00328
147	147	.48804	.00395	.00321
148	148	.43853	.00242	.00289
149	149	.38674	.00568	.00254
150	150	.38200	.00003	.00251
151	151	.33127	.00086	.00218
152	152	.16274	.00053	.00107
153	153	.10513	.00123	.00069

127	127	1.20605	.00874	.00793
128	128	1.19901	.00362	.00789
129	129	1.17113	.00600	.00770
130	130	.93489	.00111	.00615
131	131	.91666	.00329	.00603
132	132	.90712	.00491	.00597
133	133	.87744	.00437	.00577
134	134	.87454	.00001	.00575
135	135	.85846	.00641	.00565
136	136	.83540	.00617	.00550
137	137	.83482	.00014	.00549
138	138	.80568	.01724	.00530
139	139	.80568	.00022	.00530
140	140	.80124	.00079	.00527
141	141	.72300	.01047	.00476
142	142	.71122	.00222	.00468
143	143	.67572	.00465	.00445
144	144	.61532	.00320	.00405
145	145	.57037	.01409	.00375
146	146	.49928	.00775	.00328
147	147	.48804	.00395	.00321
148	148	.43853	.00242	.00289
149	149	.38674	.00568	.00254
150	150	.38200	.00003	.00251
151	151	.33127	.00086	.00218
152	152	.16274	.00053	.00107
153	153	.10513	.00123	.00069
Total	N	153	153	153

Appendix N

Multiple Linear Regression Analysis

Anova Table

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	84.909	3	28.303	64.312	.000 ^b
	Residual	63.813	145	.440		
	Total	148.721	148			
a. Dependent Variable: Mean_IGD						
b. Predictors: (Constant), Mean_PI, Mean_NGSES, Mean_I						

Coefficients Table

Coefficients ^a											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.160	.299		.537	.592					
	Mean_NGSES	-.251	.064	-.217	-3.914	.000	-.350	-.309	-.213	.962	1.039
	Mean_I	.896	.096	.584	9.370	.000	.707	.614	.510	.762	1.312
	Mean_PI	.328	.117	.174	2.818	.006	.475	.228	.153	.779	1.284

a. Dependent Variable: Mean_IGD