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NEED FRUSTRATION AND INTERNET GAMING DISORDER: THE MEDIATING ROLE OF GAMING MOTIVATIONS

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Need Frustration and Internet Gaming Disorder:

The Mediating Role of Gaming Motivations

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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 acknowledgement 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 to, entitled "Need frustration and Internet gaming disorder: The mediating role of gaming motivations", prepare and submitted by Goh Ee-I, Ku Yue Kei, and Lee Xin Qi in partial fulfilment of requirements for the Bachelor of Social Sciences (Hons) Psychology is hereby accepted.

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Abstract

In view of the widespread multiplayer online battle arena (MOBA) as one of the most popular genres among all Internet games, Internet gaming disorder (IGD) could be developed due to addictive and excessive engagement in games. Therefore, drawing from the self-determination theory (SDT), a cross-sectional study design was adopted in the present study to examine (1) the predictive effect of need frustration, intrinsic motivation, extrinsic motivation and amotivation on IGD and (2) the mediating effects of gaming motivations (i.e., intrinsic motivation, extrinsic motivation, and amotivation) on need frustration and IGD among Malaysian MOBA gamers. A total of 516 Malaysian participants ranged from aged 18 to 29 (M = 24 years), with at least one year of MOBA gaming experience, had recruited in the present study via purposive sampling method. The results revealed that need frustration, extrinsic motivation and amotivation were significant and positive predictors of IGD, but not intrinsic motivation. Concurrently, extrinsic motivation and amotivation were found to be mediating the association between need frustration and IGD. Nevertheless, intrinsic motivation was not a significant mediator. It was inferred that MOBA gamers whose basic psychological needs are being threatened might be drawn into a cycle of excessive gaming behaviours, culminating in IGD. The present study had contributed and provided more future research directions as there were limited studies conducted that focused on MOBA youth as well as the detrimental effect of need frustration on IGD in Malaysia. Concurrently, earlier prevention and intervention programmes should be practised via the focus of addressing the basic psychological needs, in order to promote healthy gaming behaviours among Malaysian youth Internet gamers.

Keywords: need frustration, intrinsic motivation, extrinsic motivation, amotivation, Internet gaming disorder (IGD), multiple online battle area (MOBA), Malaysian youth

Tables of Contents

List of Tables

List of Figures

List of Abbreviations

APA	American Psychiatric Association
CI	Confidence Interval
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5th Edition
ICD-11	International Classification of Disease, 11st Edition
IGD	Internet gaming disorder
K-S	Kolmogorov-Smirnov
MLR	Multiple Linear Regression
MOBA	Multiplayer Online Battle Area
P-P	Probability-Probability
SDT	Self-determination Theory
UTAR	Universiti Tunku Abdul Rahman
VIF	Variance Inflation Factor

Chapter I

Introduction

Background of Study

In the 21st century, Internet gaming has been the most popular leisure activity for people worldwide (Poon et al., 2021). Consistently, as stated by Haberlin and Atkin (2022), mobile technology has become the most powerful communication and entertainment platform over the years. According to the Malaysian Communications and Multimedia Commission (2020), Internet usage among Malaysians in 2020 increased to 88.7%, with a 1.3% of increment compared to 87.4% in 2018, along with 42.8% of online gamers. At the same time, the population of mobile gamers will also reach 2.6 billion in 2022 (Kelly, 2022). Consequently, the mobile gaming market worldwide is expected to increase up to 152.50 billion in 2022 (Statista, 2022).

In view of the increasing number of Internet users, the social interaction involved while players playing multiple styles of games, such as role-playing games, could bring a sense of achievement for youngsters (Lin et al., 2021a). As mentioned by Statista (2020a), the most popular game genres in Malaysia are role-playing games and casual games (29%), real-time strategy games such as *League of Legends* (24%), followed by shooting games (23%). Therefore, the higher the frequency of playing games, the greater the chance of experiencing problematic gaming behaviour (Chamarro et al., 2020).

As mentioned by Nuyens et al. (2016), *League of Legends*, which is specifically categorised as one of the games from the multiplayer online battle area (MOBA) genre, is the most popular video that wide known by others. Essentially, MOBA games are a type of real-time strategy game where players control characters, with the allocation of groups, which

generally require two teams to compete against each other (Mora-Cantallops & Sicilia, 2018). Laconi et al. (2017) depicted that since MOBA includes a large number of players playing together in real time, this requires more significant motives and social interaction with other gamers online. Moreover, MOBA players would possibly acquire higher scores in Internet gaming disorder (IGD) even though they are not interacting with non-problematic gamers (Laconi et al., 2017).

Internet gaming disorder (IGD) has become more recognized as a public mental and physiological illness and causes the individual to face dysfunction in life in many aspects (Cheng et al., 2018; Tung et al., 2022). In 2013, IGD was included as one of the disorders in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) due to the drastically increased number of cases of problematic video game usage and excessive gaming behaviours (American Psychiatric Association [APA], 2013). Meanwhile, in 2018, World Health Organization also included gaming disorder as a mental disorder in the International Classification of Diseases (ICD-11). Hence, studies about IGD have been increasing throughout the years, although the criteria to be diagnosed somewhat criticised to be problematic (Petry et al., 2014; Pontes & Griffiths, 2014).

Typically, a study by Ko (2014) depicted that those with a higher rate of IGD have a lower tolerance rate to phenomena such as social, financial, marital, family and peers. At the same time, IGD might increase the chance of getting depression, anxiety, social phobia and decrease academic performance (Ko, 2014; Nasution et al., 2019). Furthermore, another study done by Petry et al. (2015) portrayed that IGD psychological symptoms could lead to outcomes such as depression, social isolation, poor interpersonal connection, low sociability and low competence. Consistently, IGD prevalence in Malaysia is kept increasing due to the integral of Internet and video gaming usage that immerge into part of the life of the users,

particularly young adults in Malaysia (Ling et al., 2021). Hence, greater scholarly attention should be given to examining the determinants of IGD, given the population has been exponentially growing.

In the present study, need frustration was suggested as the determinant of IGD. According to Tindall and Curtis (2019), the concept of need frustration is not equivalenced to the unfulfillment of need satisfaction. Relatively, it measures a different construct dimension that indicates frustration experienced when the three basic psychological needs (i.e., autonomy, competence, and relatedness) are disregarded (Allen & Anderson, 2018). Recurrently, a study done by Kosa and Uysal (2021) illustrated that need frustration is closely related to the maladjustment of psychological needs whereby individuals might experience frustration when they are being forced to act in some manners (autonomy), comparing and competing with others (competence), and socialise and bridge to others (relatedness) (Chamarro et al., 2020; Kosa & Uysal, 2021; Lin et al.,2021b).

In the meantime, some studies found that a higher level of need frustration would lead to a higher level of problematic gaming behaviour, which lowered self-esteem and self-control (Vuorinen et al., 2022; Przybylski & Weinstein, 2019). Alternatively stated, a higher level of need for frustration may lead to IGD (Lin et al., 2021b). Thus, to compensate for the frustration faced in the real world, players will engage more in playing Internet games to feel control over the characters, be connected, at the same time, avoid feeling rejected or isolated and gain better rewards through victorious in fun (Charmarro et al. 2020). Therefore, players with a higher level of need frustration could be linked to the development of psychopathology or obsessive gaming behaviour, especially those with poor control over their real life.

On the other hand, this study also focused on gaming motivations (i.e., intrinsic motivation, extrinsic motivation and amotivation). According to Wang and Cheng (2022),

gaming motivations strongly associate with IGD. Thus, intrinsic motivation is depicted to be positively predicting IGD (Gomez et al., 2022). Meanwhile, extrinsic motivation is also found to positively predicts IGD (Wang & Cheng, 2022; Bäcklund et al., 2022). Thirdly, some past studies illustrated that amotivation positively predicts IGD (Beard & Wickham, 2016; Çırak & Erol, 2020; Mills & Allen, 2020). All in all, the current study also examines to examine the mediating effect of gaming motivation on the relationship between need frustration and IGD among MOBA gamers in Malaysia.

Problem Statement

Malaysia has been reported as one of the countries with the highest number of active users (79%) engaged in online entertainment activities in 2018 (Statista, 2020b). Consistently, the Malaysian Communication and Multimedia Commission (2020) reported that the number of users that play online games had shown a significant increase from 35.2% in 2018 to 42.8% in 2020, particularly youth account for 76.1% (Povera, 2018), which categorised as those age between 18 to 29 (Ministry of Youth and Sport, 2018).

Other than that, it is also found that the most popular genre that attracted the interest of gamers to be multiplayer online battle area, MOBA, with *Mobile Legends: Bang Bang, League of Legends, and DOTA 2* to be included as parts of the top 5 games played by Malaysia online players. However, most of the studies that focused on IGD recruited participants only from the general community (Gomez et al., 2022), children and adolescents (Macur & Pontes, 2021; Teng et al., 2021), universities students (Allen & Anderson, 2018; Mills & Allen, 2020; Taner et al., 2022) or working adults (Oka et al., 2021; Shu et al., 2018) compared to limited study that emphasized only among youth context (T'ng et al., 2022). The population of youth gamers has substantially increased throughout these years. Hence, more scholarly attention is required in obtaining empirical evidence to identify the potential

determinants. Generally, the present study aims to fill the literature gaps by focusing on youth aged 18 to 29 who are university students or working adults.

In view of the COVID-19 pandemic, addiction to Internet gaming is depicted to increase dramatically due to limited outdoor activities movements (Ting & Essau, 2021; Zhu et al., 2021). Accordingly, repetitive and re-engagement in gaming behaviours or addictive gaming behaviours could in turn lead to the occurrence of IGD (Tras, 2019). Furthermore, although the pandemic situation has turned out to be endemic, the frequent lockdown that happened in the past few years may have strengthened the habituated gaming behaviour. Subsequently, making this behaviour to be more challenging to get rid of. Meanwhile, the American Psychiatric Association (APA, 2013) has tentatively regarded IGD in Section III Emerging IGD as one of the disorders in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Thereupon, studies on addictive gaming behaviours, as well as on IGD, have been broadening over the years (Chen et al., 2018; Imataka et al., 2022; Kuss, 2013; Mestre-Bach et al., 2022).

On top of that, several studies portrayed that excessive gaming, along with Internet gaming disorder, could both provoke several detrimental and adverse effects such as triggered and increased impulsive, aggression and violent behaviours (DeLisi et al., 2013; Evren et al., 2019; Jeong et al., 2019), depression (Ostinelli et al., 2021; Teng et al., 2021; Wang et al., 2019; Wright & Wachs, 2022), increased psychological distress (Rikkers et al., 2016), reduced psychological well-being (Tsui & Cheng, 2021), anxiety (Alhamoud et al., 2022) and increased suicidal ideation and/or attempts (Bersani et al., 2022; Wicki et al. 2021). Thus, in regard to the unpleasant outcomes that IGD might bring up, it is crucial to conduct more empirical studies to underline the advantageous treatments and preventions for IGD.

Nevertheless, despite the numerous studies that have filled in the empirical evidence of IGD, it is indispensable to draw research attention to the gaps in the field. There have been several studies conducted to examine the association and/or predictive effect of other variables on IGD, such as need satisfaction (Bender & Gentile, 2020; Hui et al., 2019; Wu et al., 2017), anxiety (Huang et al., 2022) and social anxiety (Marino et al., 2020). Nevertheless, to date, there are limited studies conducted to view the relationship between need frustration and IGD (Allen & Anderson, 2018; T'ng et al., 2022). Thus, the present study seeks to extend the discovery of the predictive effect of need frustration towards IGD with gaming motivations as the mediator.

To the best knowledge, there are preliminary studies examined MOBA gamers as compared to the generally available genres (Allen & Anderson, 2018), massively multiplayer online games (MMOG; Aziz et al., 2018; Aziz et al., 2021; Muhaimin et al., 2019) and multiplayer online role-playing games (MMORPG; Yunus et al., 2021). Thus, narrowing the research gaps on MOBA games in Malaysia is needed in view of the growing population of youth gamers.

Drawing on past studies, the present study aims to examine the direct and indirect association of need frustration towards IGD while identifying the underlying mechanisms between need frustration and IGD. To date, gaming motivations have been investigated as mediators in the studies of IGD (T'ng & Pau, 2021; Wang & Cheng, 2022) though the categorisation of gaming motivations differ from the intrinsic, extrinsic, as well as amotivation (i.e., achievement, socialization, and immersion). In addition, Mills and Allen (2020) examined the mediating effect of self-control towards need frustration and IGD rather than implying the impact of gaming motivations. Therefore, a more precise and concise

understanding of different concepts of gaming motivations could strengthen the conceptualisation of IGD.

In sum, in view of the detrimental effects that may be brought up by excessive gaming, as well as IGD, crystallised and effective prevention and intervention programmes should be designed. From that, this study aims to examine the mediating effect of intrinsic motivation, extrinsic motivation and amotivation on the association between need frustration and IGD.

Research Questions

1. Do need frustration, intrinsic motivation, extrinsic motivation and amotivation positively predict IGD among MOBA Malaysian youth?

2. Do gaming motivations (i.e., intrinsic motivation, extrinsic motivation and amotivation) mediate the relationship between need frustration and IGD among MOBA Malaysian youth?

Research Objectives

1. To examine the predictive effects of need frustration on IGD.

2. To investigate the predictive effect of intrinsic motivation on IGD.

3. To study the predictive effect of extrinsic motivation and IGD.

4. To investigate the predictive effect of amotivation and IGD.

5. To study the mediating role of intrinsic motivation between need frustration and IGD.

6. To study the mediating role of extrinsic motivation between need frustration and IGD.

7. To study the mediating role of amotivation between need frustration and IGD.

Hypotheses

H1: Need frustration positively predicts IGD among MOBA Malaysian youth.

H2: Intrinsic motivation positively predicts IGD among MOBA Malaysian youth.

H3: Extrinsic motivation positively predicts IGD among MOBA Malaysian youth.

H4: Amotivation positively predicts IGD among MOBA Malaysian youth.

H5: The association between need frustration and IGD is mediated by intrinsic motivation among MOBA Malaysian youth.

H6: The association between need frustration and IGD is mediated by extrinsic motivation among MOBA Malaysian youth.

H7: The association between need frustration and IGD is mediated by amotivation among MOBA Malaysian youth.

Significance of Study

Firstly, the significance of the study is to introduce a novel research direction toward the increasing prevalence of IGD. The current study emphasises the significance of need frustration with Self-determination Theory (SDT) and the inclusion of MOBA gamers with one-year gaming experience, which can be considered an up-and-coming direction in examining IGD compared to other research primarily focused on need satisfaction and intrinsic motivation. As a fact, there is still a lack of research examining the implication of need frustration in motivating engagement in problematic gaming activity, which then influences the well-being and life satisfaction of active gamers. Concerning the reviews and

findings of current research, a distinct effect between the predictors and mediator tends to aid the comprehension of this current research with ease.

Furthermore, the study can aid in providing a valuable contribution to future research regardless of the research databases, sample data, research procedure, along with the limitation of the study, which tends to aid the researchers to achieve further accomplishment in the research topic of IGD. According to Mills and Allen (2020), there is a lack of studies in assessing the gaming motivations and self-determination theory (SDT) with IGD, as past studies emphasised the extent of personal self-control in confronting these problematic gaming practices. Hence, the study is potentially aiding future research in discovering the divergent areas of IGD.

Apart from being beneficial in society's understanding and future research, the study is also available in aiding numerous authorities such as mental health practitioners, caregivers, as well as the gamers themselves to have a better understanding of the risk factors and negative consequences on the development of the problematic gaming practices. For example, based on the current research, mental health practitioners can initial a practical and effective intervention toward IGD patients after comprehending the antecedents of the gaming practices. Furthermore, current research might also aid caregivers in preventing and improving problematic practices by fulfilling basic psychological needs such as the need for relatedness. Finally, the present study may help in self-reflection among problematic gamers in pertaining to the extent of basic psychological needs fulfilled and prevent counterproductive effects.

Conceptual Definitions

Internet Gaming Disorder (IGD)

According to the American Psychiatric Association (2013), IGD is categorized as a mental disorder in which the individual engages in problematic gaming practices for a continuous of 12 months. Indeed, the individual is overly engaging in gaming practices considered abnormal in seeking stress-coping strategies or fulfilling the fundamental needs. Additionally, IGD result in negative emotional states such as anxiety and the detrimental implication in a myriad of functioning areas such as occupational, education and social.

Need Frustration

Need frustration indicates the extent of the individual failing or being impeded by internal or external drives in pursuing essential psychological needs fulfilment (autonomy, competence and relatedness). Meanwhile, autonomy frustration refers to the continuously controlled status of the individual by others, competence frustration refers to the incapability or lack of confidence of the individual in performing the tasks allocated, and lastly, relatedness frustration which refering the concerns of social isolation and lack of success in maintaining and expanding social relationship. According to the research of Kosa and Uysal (2021), there is a significant relationship between the degree of need frustration and abnormal gaming practices, which result in devastating of physical and psychological well-being.

Gaming motivations

Gaming motivations refer to states of stimulation and intention in influencing the patterns of gaming practices about intensity and frequency. Based on the research of Hulaj et al. (2020), gaming motivation is divided into **intrinsic motivation,** which the gaming practices emphasize for their own sake and result from self-stimulate; **extrinsic motivation** refers to

the external stimulation of the gaming practices; **amotivation,** which indicates that the diminish or absence of stimulation state in participating in gaming practices.

Multiplayer Online Battle Arena (MOBA)

It indicates a gaming strategy to improve the gaming connectedness and communication by allowing several gamers to participate in a shared battlefield for confrontation among the teams. Pertaining to differentiation, each player with the selective hero or character will be equipped with specific skills and capabilities to help the belonging team to fight against the opposite team. In MOBA, collaboration and cohesion among team members are considered essential to achieving success, hence MOBA is perceived as a means for fulfilling needs.

Operational Definitions

Internet Gaming Disorder (IGD)

The utilisation of the Internet Gaming Disorder Scale-Short Form (IGDS9-SF) was developed by Pontes and Griffiths (2015) to assess the degree of seriousness of IGD and its consequences on individual functioning areas. The scale consists of a total of 9 items with a 5-point Likert scale with 1 indicating '*Never'* and 5 '*Very Often'*. The greater the total score, the severity of the degree of IGD in influencing the individual.

Need Frustration

Basic Psychological Needs Satisfaction and Frustration Scale (BPNSF), which was developed by Chen et al. (2015), is applied to assessing the extent of satisfaction or frustration about the basic psychological needs fulfilment (autonomy, competence and relatedness). The scale is composed of a total of 12 items with a 5-point Likert scale that

ranges from 1 (*completely untrue*) to 5 (*completely true*). The greater the total score, the greater the satisfaction or frustration regarding psychological needs.

Gaming motivation

In order to examine the stimulation factors in prolonged gaming practices, Gaming Motivation Scale (GAMS) generated by Lafrenière et al. (2012) was used to assess the type of motivation that affects the desire of individuals to perform gaming practices. The scale included a total of items with six subscales (intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external motivation and amotivation) and are ranged by 7-point Likert scale with 1 (*do not agree at all*) and 7 (*very strongly agree*) motivation in affecting the gaming practices.

Multiplayer Online Battle Arena (MOBA) Gamers

In terms of recruiting representative respondents in the current research, it is essential to identify the genre under MOBA to prevent biased responses initially. The MOBA genre that consist in current research are League of Legends, Dota 2, Pokémon Unite, Honor of Kings, and Mobile Legends. Afterwards, several Facebook platforms are sorting out the purpose of posting the survey to recruit MOBA gamers in Malaysia. The included platforms are Mobile Legends MOBA (Malaysia), Pokémon Unite (Malaysia), POKEMON UNITE MALAYSIA, Mobile Legends Malaysia, [OFFICIAL COMMUNITY] League of Legends Malaysia and Malaysia League of Legends.

Chapter II

Literature Reviews

Conceptualizing on Internet Gaming Disorder (IGD)

According to APA (2013), Internet Gaming Disorder (IGD) was included in DSM-5 under Section III, Emerging Measures and Models. In DSM-5, IGD is defined as the persistent and recurrent use of the Internet to engage in game behaviours, commonly with other players, which significantly lead to life impairment or distress, with persistent over a 12-month period (APA, 2013). There are nine criteria for IGD, while an individual must achieve five criteria and experience the criteria in a 12-month period to be diagnosed. In DSM-5, the nine criteria to be diagnosed as IGD include: (1) preoccupation with Internet games which refers to the individual to be more dominant in Internet games compared to other daily activities; (2) withdrawal symptoms exist such as irritability, anxiety or depression when Internet gaming is taken away; (3) tolerance in increasing more hours spent in Internet games; (4) loss of self-control in participation in Internet games; (5) devote interest only in Internet games despite the previous interest hobbies and entertainment; (6) unstoppable excessive use of Internet games with prior knowledge that the psychosocial problem presents; (7) dishonest reporting to others on the amount of time used in Internet games; (8) playing Internet games to escape or get relief from destructive emotions (i.e., helplessness, anxiety and remorse); (9) engaging Internet games negatively affected or lost a significant relationship, job or educational and career opportunity (APA, 2013).

Conceptualizing on Need Frustration

Need frustration is defined as the degree to which a person feels thwarted from satiating their three basic psychological needs in daily life (Mills & Allen, 2020). There are three types of need frustration, including autonomy frustration, competence frustration, and

relatedness frustration. According to van Tuin et al. (2020), the concept of need frustration has differed from a low level of satisfaction, whereby being dissatisfied need not invariably signify that basic needs are being obstructed or frustrated. Thus, although both need satisfaction and need frustration are operating identical dimensions (i.e., autonomy, competence, and relatedness), they should be addressed as distinct constructs. A high level of need frustration would contribute to destructive outcomes such as low self-efficacy, ill-being-psychopathology, and maladaptive functioning in life (Chamarro et al., 2020; Tóth-Király, 2019). Meanwhile, Ryan et al. (2006) also depicted that individuals with higher levels of need frustration would perform some adverse behaviours, such as lacking skills in self-control and exhibiting aggression or erratic behaviours. These are categorised as compensatory behaviours for the obstructed basic needs such as being forced to act in an involuntary manner (autonomy), feeling incompetence to others (competence), as well as feeling unconnected or isolated from the social network around (relatedness).

Conceptualizing on Intrinsic Motivation

Intrinsic motivation is classified as one of the components of gaming motivation (Ryan & Deci, 2000). It is prototypically autonomous compared to different types of motivation (i.e., extrinsic motivation and amotivation). It means that when an individual experiences intrinsic motivation, the individual will perform certain behaviours with positive feelings, curiosity, and work to master optimal challenges (Buil et al., 2019). In other words, individuals participate in an activity solely because they find it entertaining and enjoyable. Thus, by adopting the concept into gaming motivation, it refers to gamers engaging in Internet gaming for the pleasure and enjoyment in the games. Consistently, intrinsic motivation was also found to have an association with maladaptive exhaustion that could increase the problematic pattern in gaming (Mills & Allen, 2020)**.** Hence, intrinsic motivation

for gaming is highly associated with the plausibility of a loss of self-control among gamers as the enjoyment of games increases the adaptation towards problematic gaming behaviours.

Conceptualizing on Extrinsic Motivation

In general, extrinsic motivation is interpreted as an individual's behaviour in conducting an activity with the expectation to get rewards from the external resource; or to avoid certain adverse circumstances (Gomez et al., 2022). Applicably, extrinsic motivation in Internet gaming refers to the external force, especially when they receive preferable outcomes (e.g., socialising well with others, triumphing in games), reinforcing their gaming behaviour. (Beard & Wickham, 2016). On the other hand, the external drives could also include the urge to escape from stressors and deadlines, struggles to achieve key performance indicators (KPI), and other real-life commitments (van Tuin et al., 2020). With the external drives to drive the urge of gamers to immerse in Internet games, there is a higher likelihood for one to increase the time spent on gaming, with the aim to ensure that they could be awarded with the preference reinforcers or rewards (e.g., to become more social accepted through the virtual environment), which may lead to problematic gaming behaviours (Gomez et al., 2022).

Conceptualizing on Amotivation

According to Deci and Ryan (1985), amotivation is the motivation type that illustrates the absence of deliberate desire for any action. In other words, amotivation is referred to as the opposite sides of motivations (i.e., intrinsic motivation and extrinsic motivation) that contribute poorly in driving certain behaviours. This might be due to the failure to recognise the correspondence between their behaviours and the consequence of those activities (Lafrenière et al., 2012). Thus, by implying the construct into gaming, amotivation refers to the gamers' lack of motivation to engage in Internet gaming behaviours (Király et al., 2022). Meanwhile, amotivation could also be evident as the unmotivated

feelings of the gamers, whereby the games do not generate any feeling of competence and do not feel worthy or bring any value (Hulaj et al., 2020). Therefore, individuals with amotivation, in accordance with unworthy and meaningless interpretations towards the games, are more likely to develop psychopathology problems (Király et al., 2022).

Need Frustration and IGD

Allen and Anderson (2018) reported that there is an association, specifically a positive predictive effect of need frustration on IGD. Gamers with higher need frustration, which includes the situation of being forced to act against their will (autonomy), feeling of incompetence toward others (competence), and feeling isolated (relatedness) from real-life situations, are expected to have a greater chance encountered IGD (Chamarro et al., 2020). In other words, need frustration may occur due to uncontrollable demands faced in the frustrating physical world. This could divert the force into excessive gaming, potentially developing into IGD (Kuźma et al., 2020).

In addition, MOBA gaming allows players to engage in a non-physical socialised platform that could compensate for need frustration in several ways, including the ability to characterize volunteer choices through games, feel competence to others through triumphs of games, and feel connected to the world (Allen & Anderson, 2018). Vansteenkiste and Ryan (2013) indicated that a higher level of IGD among gamers represents a higher level of need frustration in basic psychological needs faced in real life. Consequently, the addictive and repetition of gaming behaviours would present at a higher likelihood to occur due to maladaptive coping skills that adopted to overcome the need frustration (Allen & Anderson, 2018; Bender & Gentile, 2020; Mills et al., 2018). At the same time, Chamarro et al. (2020) portrayed that increased of screen time usage in gaming behaviours could be an underlying risk factor for IGD. This could be explained as need frustration influences the demand for

pleasure for winning a game, as well as to escape boredom, which in turn increases the frequency of Internet gaming that might lead to triggering of IGD (Chamarro et al., 2020; Kardefelt-Winther, 2016; Kuźma et al., 2020).

Intrinsic Motivation and IGD

According to Mills and Allen (2020), it is frequently discovered that intrinsic motivation is greater associated with the feelings of enjoyments and vitality. With the presence of intrinsic drives, the outcomes are postulated to be adaptive to individuals, at the same time increasing personal perceived enjoyment of the behaviours (Hulaj et al., 2020; Wu & Santana, 2022). In other words, as gamers fulfilled the state of enjoyment and feel self-motivated, this could lead to adaptive enjoyments in gaming behaviours that might lead to IGD.

To date, much of the literatures revealed the role of intrinsic motivation in problematic gaming behaviour (Gomez et al., 2022; Wan & Chiou, 2007). This implies when players reach out to the games in terms of their own choice rather than to achieve something, at the same time incorporating their gaming habits into their sense of identity (Beard & Wickham, 2016). With the increased intention to play games that foster the intrinsic motivation of gaming behaviours, it is more likely that excessive or problematic gaming behaviours might emerge from an insatiable drive to enjoy and seek attainments through Internet gaming (Billieux et al., 2013).

Simultaneously, Ryan et al. (2006) remarked that players with a higher degree of autonomy in virtual environments could motivate them to keep playing with pleasant experiences. In view of the popularity of MOBA games, it is concluded that the controls that players have onto the games allow them to feel dominating the characters through the voluntary actions allowed (Millar, 2017). This is accounted to the positive playing

experiences and satisfaction that players could experience, which lead by high level of autonomy (Brühlmann et al., 2020) This may be due to the nature of the MOBA that excite lower level of tension, which increased the satisfaction of gamers, at the same time marking a higher of repetitive involvements in the games.

Extrinsic Motivation and IGD

Empirical studies have reported the association between extrinsic motivation and IGD (Mills & Allen, 2018; Beard & Wickham, 2016; Çırak & Erol, 2020; Wan & Chiou, 2007). Study by Khan and Muatadir (2016) depicted that problematic online gaming behaviour is positively predicted by external drives such as social motivation. The external drives (external reinforcers) that drive players to engage in problematic gaming behaviours could include eagers towards social interaction (Yao & Zhong, 2014; Yee, 2006), games advancements and achievements (King & Delfabbro, 2014) as well as self-affirming purpose (Aydin & Sari, 2011). With the access to external reinforcers that one preferred, they would choose to repeatedly play the game (Beard & Wickham, 2016).

At the same time, studies portrayed that external drives that enhance extrinsic motivation will have a greater extend for individuals to develop into negative consequences, including IGD due to the obsessive passion towards the bahaviour (Mills et al., 2018; Seguin-Levesque et al., 2003). Further, extrinsic motivation is postulated as a significant and positive predictor of psychopathology symptoms, including IGD (Mills & Allen, 2020). With higher hours of Internet gaming to satisfy extrinsic motivation, gamers have a higher feasibility of associating with IGD risks (Kurnianingsih et al., 2018).

Concurrently, MOBA games could provide the resources that able to serve as the external drives that drive the reengagement behaviours in gaming behaviour. As an illustration, Umyatur and Amalia (2020) revealed that MOBA could be addressed as “skill

games" since it required teamwork and strategies to win games. Meanwhile, Nuyens et al. (2016) posited that social interaction appears to be one of the rewards (external drives) driving excessive and problematic gaming behaviour. Negotiation between team members of MOBA games allowed players to unmute or chat with each other in the virtual world, which enabled non-face-to-face socialization. Thus, MOBA is concluded as a challenging game, whereby victories in games will provoke feelings of honour (Umyatur & Amalia, 2020), and eager to socialise with others (Bonny & Castaneda, 2022), giving rise to repeating interest of gamers to join games, which may lead to loss of control on gaming behaviour (excessive gaming behaviour).

Amotivation and IGD

Studies postulated that amotivation is correlated with maladaptive outcomes (Mouratidis et al., 2011; Tóth-Király et al., 2019). As mentioned by Peracchia et al. (2019), amotivation is associated with certain psychopathology symptoms, including anxiety and depression, which possibly lead to fewer interests towards other subjects. With the limited urge to participate in any activity, gamers are believed also to have lower frequency of engaging in Internet gaming behaviours (Lafrenière et al., 2012; Vallerand, 1997). From that, Lafrenière et al. (2012) portrayed that amotivation is negatively predicting the frequency of gaming.

Nevertheless, a study by Beard and Wickham (2016) concluded that amotivation positively predicts IGD through high frequency of Internet gaming behaviour. This is further explained when amotivation could be attributed as the inability to control one's gaming behaviour despite being consciously aware and acknowledged of the detrimental effects of excessive gaming behaviours (Mills et al., 2018). Amotivation may be due to failure or unsuccessful compensation through Internet gaming experiences, which in turn excessively

culminating the dependence on MOBA games, which is highly possible to resemble into problematic gaming behaviours (Mills et al., 2018; Rehbein et al., 2015). This supports the concept of amotivation that claimed that individuals feel futility to control the player's power in engaging in video gaming. Thus, the present study aims to examine whether amotivation positively predicts IGD among Malaysian youth.

Need Frustration, Gaming Motivations and IGD

To date, only two studies examined the mediating roles of gaming motivation on need frustration and IGD (Mills et al., 2018; T'ng et al., 2022). Lafrenière et al. (2012) postulated that an increased in need frustration would lead to further drive in gaming, especially attracted by this virtual environment. Internet gaming provide a compensating opportunity for players to take up the slack in the three needs (i.e., autonomy, competence, and relatedness), which encourages them to feel empowered overall. In other words, when one feels frustrated whereby the three basic psychological needs are confronted, players will have a higher likelihood of developing obsessive gaming behaviour, which could easily provoke IGD. This could be accounted to the limited extend of self-control that players could withhold during the high level of need frustration (Przbylski & Weinstein, 2019). For instance, Mills and Allen (2020) mentioned that Internet gaming has the most significant influence towards emotions and psychopathological effects towards the gamers through the enforcement of intrinsic motivation when they view the real-world differently from the experiences encountered in the virtual world.

Additionally, Allen and Anderson (2018) portrayed that the problematic Internet gaming behaviour will increase with the rise in frequency of engaging in gaming behaviour. Further, gamers could satisfy their three psychological needs whereby they are allowed to strive through control over the characters of the games, being competent with other gamers,

as well as develop online social network with other gamers (Mills et al, 2018). These fostered the gaming motivations of gamers, which in turn pertaining and relying on the Internet gaming to compensate the frustrating physical world (Beard & Wickham, 2016).

Rooted in the mediating effect of gaming motivations towards the association between need frustration and IGD, MOBA is reported to be the most leading genre that associated with IGD (Chamarro et al., 2020). According to (Tyack et al., 2016), MOBA games are challenging, streamlined, as well as full attention is needed when immerse in a game. Therefore, it allows the concentration of players from blocking the other disruptions in real-life, while to solely attend to the MOBA games. This implies that MOBA games allow an escape of players from the frustrations acquired through the real-life experiences, which lead to fostered of gaming motivations that triggered problematic gaming behaviours. Thus, need frustration is strongly associated with gaming motivations, at the same time contributing predictive effect towards IGD, specifically through MOBA games.

Theoretical Framework

Self-determination Theory (SDT), a well-developed motivational theory developed by Ryan and Deci, emphasizes the extent of an individual's accomplishment in basic psychological needs (i.e., autonomy, competence, and relatedness). According to Legault (2017), the concept of basic psychological needs is engrafted in six mini theories constituted in SDT to postulate on individual motivation and humanity's growth and development. In particular, the mini theories are (1) Cognitive Evaluation Theory (CET), (2) Organismic Integration Theory (OIT), (3) Causality Orientation Theory (COT), (4) Goal Contents Theory (GCT), (5) Relationship Motivation Theory (RMT), and (6) Basic Psychological Needs Theory (BPNT) (Tyack & Mekler, 2020). In the current research, BPNT is the main focus in

examining its relationship with need frustration, whereas motivational factors as the mediator in leading to IGD.

Regarding this aspect, SDT is widely applied in examining the relationship between need satisfaction or need frustration as the predictors of the development of habits or actions by the mediating role of motivation (Chamarro et al., 2020; Kosa & Uysal, 2021; Mills & Allen, 2020; Rho et al., 2018). Based on current research, SDT posited that frustration as a negative emotional state tends to trigger engagement in problematic gaming practices as the state of dissatisfaction plays a role in motivating participation in order to achieve the basic psychological needs. This can be explained through (1) intrinsic motivation, denoted that the engagement in gaming practices primarily for the purpose of inner self consolation, (2) extrinsic motivation, indicates the engagement is owing to external drives such as tangible rewards or psychological satisfaction, and lastly (3) amotivation, revealed that the unclear or unconscious intention in the participation of gaming practices (Ryan & Deci, 2000; Tyack & Mekler, 2020).

Correspondingly, the extent of the basic psychological needs' accomplishment is explained through the initial framework by Ryan and Deci (2000) in which the degree of accomplishment is measured through need satisfaction and need frustration. It is wise to discern that need satisfaction and need frustration are allocated as two extremes on a continuous continuum, indicating that the greater need frustration does not represent the lower need satisfaction (Longo et al., 2018). Meanwhile, need frustration is denoted as the state of needs deprivation or scarcity that probably owing to internal or external drives in restricting the accessibility of the individual in need satisfaction.

Rooted in SDT, need frustration tends to be ingrained in autonomy, competence and relatedness, resulting in the invasion of cognition, emotions and social development. For

instance, autonomy frustration that due to the deficiency of a sense of control over might lead to the diminish of self-efficacy and perceived on external locus of control; competence frustration results from capability constraints precipitate to low self-esteem or self-doubt; lastly, relatedness frustration that in view of social isolation or restricted social network perchance incite of marginalised (Chamarro et al., 2020). Kosa and Uysal (2021) posited that there is a detrimental effect of need frustration in constructing undesired outcomes such as problematic gaming practices which then developed into IGD resulting from the influence of motivation that precipitate the gaming practices in fulfilling the basic psychological needs.

Conceptual Framework

In the present study, the extent of need frustration in basic psychological needs (i.e., autonomy, competence, and relatedness) serves as a predictor in the development of IGD among MOBA Malaysian youth. This indicates the greater in the extent of need frustration will increase the likelihood of the development of IGD. Furthermore, gaming motivations (i.e., intrinsic, extrinsic and amotivation) are postulated as predictors of IGD among the MOBA Malaysian youth. Likewise, intrinsic and extrinsic motivation is hypothesized to significantly predict the diagnosis of IGD, whereas amotivation is hypothesized to not significantly predict IGD. Additionally, current research also examines mediating effect of gaming motivation between the association of need frustration and the diagnosis of IGD.

In the aspect of the predictive role of need frustration in IGD, it is posited that the deprivation of need fulfilment regardless in the domains of autonomy, competence and relatedness will lead to the problematic construction of cognition, emotions and social functioning areas. As a regard, the deprivation or failure in achieving the basic psychological needs may lead to a state of emptiness which then triggers the motivation in seeking compensation through virtual reality. This is supported by Tóth-Király et al. (2019) that

stated need frustration significantly predicts problematic gaming practices to recompense the need's deprivation.

Furthermore, gaming motivation is perceived to have a significant predictive effect toward IGD. In the perspective of intrinsic motivation in precipitating the problematic gaming practices, that attribute the gaming practices as the means to seek inner pleasure and satisfaction (Ryan & Deci, 2000). Owing to the intrinsic basic psychological needs achieved through gaming such as autonomous control, self-recognition and social connection, these desired outcomes have the greater likelihood in causing the problematic gaming dependency. Gaming practices tends to result in a state of flow which refers to a fully immersed or involvement in a particular activity that brings inner satisfaction (Hu et al., 2019; Kurnianingsih et al., 2018; Söbke et al., 2020). Therefore, based on the discussion of Hu et al. (2019), the flow state and desired mental states that experienced during the gaming practices tends to increase the vulnerability of IGD.

Apart from the intrinsic motivation, extrinsic motivation is hypothesised as the significant predictor of IGD. Extrinsic motivation indicates the implication of the external drives that motivate and trigger the engagement or alteration of an individual's cognition, emotions and behaviors (Mills & Allen, 2020; Tyack & Mekler, 2020). In regard to extrinsic motivation, it can be representing in various component, such as (1) instrumental reward, refers to tangible desired outcome such as monetary, (2) informational reward, indicates of the acquired of feedback or approval from others, such as the capability and competency in gaming, and (3) relatedness reward, represents of the sense of connectedness to the society and obtain belonginess among the gamers, such as social affiliation fulfilment through communication in the virtual gaming (Cruz et al., 2017; Whittaker et al., 2021). This is supported by the study of Sabri and Yunus (2021) that stated the engagement in the

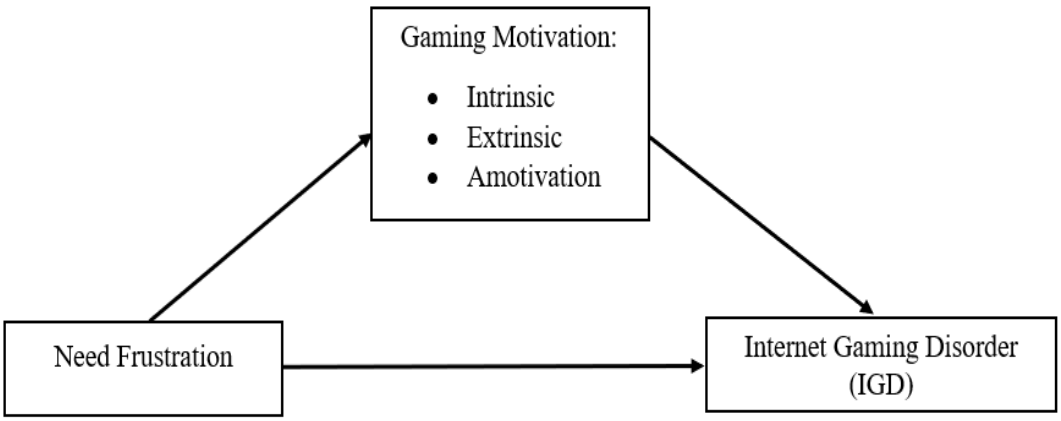
problematic gaming practices serves as a means to aid the gamers for compensating their needs deprivation to enhance their psychological well-being and life satisfaction.

In turn, amotivation is postulated to have significant predictive effect in the diagnosis of IGD. The construct of amotivation is concerning unmotivated state or deficiency of preferences in the engagement in the activity (Mills & Allen, 2020; Ryan & Deci, 2000; Ryan & Deci, 2020; Söbke et al., 2020). Therefore, current research hypothesised that amotivation positively predicts IGD through a high frequency of invovement. To date, there are a few studies that mentioned that amotivation has the greater risk in predicting the IGD resulting from the deficits in internal locus of control as well as unintentional dependency (Beard & Wickham, 2016; Çırak & Erol, 2020; Mills & Allen, 2020).

Therefore, current research aims to examine the predictive roles of the need frustration and gaming motivation toward the vulnerability of IGD with the application of SDT. Furthermore, the present study aims to examine the association between the need frustration and IGD with the mediating factor of gaming motivation.

Figure 2.1

Conceptual framework of the study on need frustration and Internet gaming disorder: The mediating role of gaming motivations



Chapter III

Methodology

Research Design

In this study, a quantitative research approach with an online survey research design was applied for data collection, analysis, and interpretation. A quantitative design was beneficial and corresponded with the study hypothesis in examining the predictive effects of need frustration, intrinsic motivation, extrinsic motivation and amotivation on IGD. Furthermore, the present study also examined the mediating effect of intrinsic motivation, extrinsic motivation and amotivation on the relationship between need frustration and IGD. According to Creswell and Creswell (2018), a quantitative research approach emphasises collecting numerical data or descriptive statistics through descriptive studies or surveys. In the present study, the descriptive data regarding the need frustration, gaming motivation and IGD of the respondents was obtained through the self-administered survey to examine the hypotheses.

Based on the survey design, structured instruments were utilised to assess the respondents' perceptions, behaviours, and emotional states in accordance with the variables and hypotheses of the research (Çırak & Erol, 2020; Goodwin & Goodwin, 2016; Rho et al., 2018). The survey in the present study mainly consisted of demographic variables along with the instruments that measured the respondents' need frustration, gaming motivations and IGD. Likewise, a cross-sectional design in data collection is widely applied in social science-related research in appraising the pervasiveness of the respondents' responses at one time to prevent the dropout concerns of respondents and unpredictable external factors (Connelly, 2016; Taechoyotin et al., 2020; Severo et al., 2020). A cross-sectional design was employed

in this study due to the various requirements such as time limitations and it was relatively convenient for data gathering and analysis (Kosa & Uysal, 2021; Mills & Allen, 2020).

Sampling Method

In the current study, non-probability sampling method was utilised. Non-probability sampling was used when the research was impossible to ensure each respondent in the target population could be randomly included in the research (Goodwin & Goodwin, 2016; Showkat & Parveen, 2017). According to Goodwin and Goodwin (2016), the non-probability sampling method was only appropriate to be used in research that has the specific interest of the research requirement as due to representativeness of respondents plays a significant role in the research analysis and discussion. In the present study, the respondents were unable to select randomly within the population owing to the criteria that were required in the present research.

On top of that, a purposive sampling method was utilised to ensure the sample's representativeness and the result's accuracy through an intentional selection process of the respondents based on inclusion and exclusion criteria (Campbell et al., 2020; Berndt, 2020). Regarding the present research, the inclusive criteria included (1) Malaysian nationality, (2) aged between 18-29, (3) MOBA gamers, and (4) with at least one year of gaming experience.

Several studies adopted the purposive sampling method to examine the variables' predictive effects with IGD (Adam et al., 2019; Beard & Wickham, 2016; Chamarro et al., 2020). According to Adam et al. (2018), the application of purposive sampling in examining the predictive effects of anxiety and family relationships in IGD among adult gamers of Massively Multiplayer Online (MMO) in Australia. Thus, the present study intentionally recruited the respondents based on the inclusion criteria to make sure of representativeness by posting the survey on the online platform that exactly relates to the MOBA genre. Apart from

that, according to Beard and Wickham (2016), the design of the research allows them to utilise of purposive sampling method in recruiting the respondents in examining the association of inner satisfaction and IGD which the criteria included age 18 and above with Massively Multiplayer Online Role-Playing Games (MMORPGs) experience.

Sample Size

Schoemann et al. (2017) suggested that Monte Carlo Power analysis was an effective way to calculate a mediation study's sample size. This method was used when the indirect effect of mediators could be considered for the sample size calculation (Thoemmes et al., 2010). With the direction of paths expected, standard deviations, as well as the correlation of each variable to be inserted into the calculator, the calculator will suggest the minimum sample sizes (Schoemann et al., 2017).

Since there were three dimensions under the spectrum of gaming motivations (i.e., intrinsic motivation, extrinsic motivation, and amotivation), the average of the three sample sizes was calculated. After calculating the average sample size required, the number revealed a total of 217 participants at 95% statistical power to be the minimum number of responses to be collected (see Appendix B). Nevertheless, given the potential occurrence of a large number of outliers due to data collection through an online survey, this study recommended adding an extra 50% of the samples. Thus, it recorded a minimum total number of 326 responses. The actual sample size that was recruited from the present study recorded a total of 1265 responses, by filtering out the unwanted responses, there was a total of 527 remaining responses used to be included in the process of data analysis.

Location

In this study, the respondents were youth with ages that ranged between 18 to 29 in Malaysia. Responses were collected from participants from different states in Malaysia.

Participants

The participated respondent in this study were Malaysian aged between 18 to 29, who had at least one year of MOBA gaming experience. Thus, those who failed to meet the inclusive criteria were filtered out of the current study.

Research Instruments

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

Pontes and Griffiths (2015) developed the IGDS9-SF to examine the seriousness of Internet Gaming Disorder (IGD) along with its consequences on gamers' well-being. This scale consisted of a total of 9 items with the allocation of a 5-point Likert scale ranging from 1(*never*) to 5 (*very often*). The scale included items such as "Do you feel preoccupied with gaming behaviour?", "Do you feel more irritability, anxiety or even sadness when you try to either reduce or stop your gaming activity?', and "Do you play in order to temporarily escape or relieve a negative mood such as helplessness and anxiety?'' The calculation procedure of summarization for all items to achieve the final IGD score, the greater score indicated as the greater intensity of IGD. The Cronbach's alpha (α) of the scale was found to be .794, indicating an excepted consistency and correlation among the items.

Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS)

Chen et al. (2015) generated the BPNSFS to determine the extent of satisfaction and frustration toward the psychological needs of autonomy, competence and relatedness. The scale consisted of 3 subscales (i.e., autonomy, competence, and relatedness), with each subscale including 8 items in measuring the extent of satisfaction and frustration. Specifically, the present study emphasized the basic psychological need frustration items based on the research topic, with 4 items presented in each subscale. Thus, there was a total of 12 items with a 5-point Likert scale that ranged from 1 (*completely untrue*) to 5

(*completely true*) with the scale interpretation of the greater the total score, the greater an individual's or frustration state according to the particular psychological needs. The internal consistency of the need frustration-related subscales was acceptable for competence (α = .897), autonomy (α = .775) and relatedness (α = .878), indicating good internal consistency.

Gaming Motivation Scale (GAMS)

Lafrenière et al. (2012) developed the GAMS to appraise the motivation of gaming practices in terms of six subscales, including intrinsic motivation, four factors of extrinsic motivation (i.e., integrated regulation, identified regulation, introjected regulation and eternal regulation), as well as amotivation. The application of a 7-point Likert scale that ranged each subscale that consisted of 3 items respectively from 1 (*do not agree at all*) to 7 (*very strongly agree*). For the scoring interpretation, the greater the total score, the greater the effect of the particular motivation subscale in influencing gaming practices. In the aspect of internal consistency in the present study, all Cronbach's alpha (α) were above .700 for each subscale (see Appendix D), except for external regulation (α = .672). At the same time, the internal consistency of all items was recorded as .885, illustrating good internal consistency.

Procedure

Prior to the study, ethical clearance was applied from the Scientific and Ethical Review Committee of UTAR to seek approval for the involvement of human subjects in the present study (refer Appendix H). Next, before conducting the actual study, a pilot study with 114 responses was conducted to assess the feasibility and reliability of the measurements, as well as the utility of the methods in a greater study (Christodoulou et al., 2015; Leon et al., 2011). The questionnaires were generated via Qualtrics. Next, the survey link to the set of questionnaires was distributed through Facebook community groups, including Mobile Legends MOBA (Malaysia), Pokemon Unite [Malaysia], POKEMON UNITE MALAYSIA,

Mobile Legends Malaysia, [OFFICIAL COMMUNITY] League of Legends Malaysia, Malaysia League of Legends, MOBILE LEGENDS MALAYSIA, DOTA 2 Malaysia | Players, and DOTA 2 Malaysia.

As regards the research inclusion criteria of (1) Malaysia nationality, (2) aged between 18-29, and (3) at least one-year gaming experience in MOBA such as *League of Legends*, *Dota 2*, *Pokémon Unite*, *Honor of Kings*, and *Mobile Legends*, respondents were recruited through the spreading of online surveys through social media platforms. For the concern of confidentiality, attached informed consent at the front of the online survey for the warrant purpose of the Personal Data Protection Act (2010) in utilising the personal data of the respondents. There was an ought for the respondents to agree with all the terms and conditions of the survey participation before proceeding to the following demographic section, and others. Participation in this online survey was a voluntary act while the data collected were encrypted and only accessed by researchers and supervisor.

Data Analysis

The present study utilised Statistical Package for Social Sciences (SPSS) version 22 for data analysis. The reliability analyses for all variables for the pilot study were conducted. Cronbach's alpha coefficient was used to determine the consistency of the constructs, which could indicate the reliability of the variables. Additionally, according to George and Mallery (2003), Cronbach's Alpha coefficient value should be between .70 and .79 to be deemed as "fair", between .80 and .89 to be considered "good" and above .90 to be considered "excellent". Nevertheless, few scholars remarked that the acceptable range of value of Cronbach's alpha to be above .600 (Hulin et al., 2001; Raharjanti et al., 2022; Shi et al., 2012), illustrating acceptable internal consistency for all subscales in the present study. Consistently, IGD was presented as the outcome variable, need frustration as the predictor,

and gaming motivations (i.e., intrinsic motivation, extrinsic motivation and amotivation) to be the mediators of the association between need frustration and IGD.

Normality Assumptions

Prior to the data analyses, analyses on skewness and kurtosis, Kolmogorov-Smirnov (K-S) test, probability-probability (P-P) plot and histogram were conducted to check the normality assumptions.

Skewness and Kurtosis. According to Mishra et al. (2019), skewness and kurtosis measured the asymmetry, as well as the tailedness of the probability distribution. The acceptable value of skewness and kurtosis fall between –2 and +2.

Kolmogorov-Smirnov (K-S) test. The K-S test was used to check the continuity of distribution through the comparison of the collected scores to the predictive sample scores that were normally distributed (Trochim & Donnelly, 2006). A value of $p > .05$ indicated that there was no significant difference between the sample distribution and the normal distribution.

Probability-Probability (P-P) plot. The P-P plot was used to test the normality assumptions through the comparison of the observed cumulative probability distribution with the expected cumulative probability distribution scattered on the graph. Plots (observed cumulative probability) that were lying approximately in the straight line of expected cumulative probability indicated the data to be normally distributed and vice versa (Ramachandran & Tsokos, 2020).

Histogram. Histogram, the plotted graph of observed values against frequency was used to check a normal distribution through the visual indicator. According to Field (2009), a bell-shaped distribution indicated that the sample data is normally distributed.

Descriptive Statistics

The summarization and preparation of demographic variables and descriptive statistics of variables as evidence and support for the findings (Cohen et al., 2017). The calculation of means and standard deviations for the demographic variables such as age, status of relationship, race, status of employment, level of education, frequency of gaming behaviours, gaming duration and Internet gaming experience.

Multiple Linear Regression (MLR) Assumptions

To examine the predicting effects of need frustration, as well as gaming motivations, multiple linear regression (MLR) was adopted, with the cut-off point of .05 significance value applied for all statistical analyses. Data analysis for assumptions of MLR, such as independence of error, multicollinearity, normality of residual, linearity and homoscedasticity were conducted, while Cook's distance, Mahalanobis Distance, and Leverage Value were adopted to detect multivariate outliers and influential cases.

Independence of Error. The Durbin-Watson test was utilised to evaluate the assumption of error independence, with the closer the value to two, the higher the congruence of the results (Chen, 2016).

Multicollinearity. The present study examined multicollinearity by observing the values of tolerance and variance inflation factors (VIF). The derived tolerance value bigger than .10 and VIF value smaller than 10 illustrate the absence of multicollinearity (Pallant, 2016).

Normality of Residuals, Linearity and Homoscedasticity. The normality of residual, linearity and homoscedasticity were observed by plotting residuals value against the expected value. A random and even pattern of residuals scatterplot displayed along the zero indicates no violation of the three assumptions (Osborne & Waters, 2002).

Multivariate Outliers and Influential Cases. Three measures were used to detect outliers, including Cook's distance, Mahalanobis Distance, and Leverage Value. According to Cook and Weisberg (1982), Cook's distance of cases' values that exceeded the value of one indicates the presence of outlier(s). Next, the Mahalanobis distance value that was smaller than 15 for a sample of 100, while 25 as the cut-off point for a sample of 500 illustrates the detection of outlier(s) (Barnett & Lewis, 1994). Thirdly, values that were bigger than two times Leverage's value, $2 \times \left[\frac{(k+1)}{n}\right]$ for the dataset could be suspected as outliers (Hoaglin & Welsh, 1978).

Inferential Statistics

Process Macro. This analysis was applied to determine if gaming motivations were mediating the association between need frustration and IGD, this study adopted Hayes's (2018) process of macro to study the mediating effect. There were three pathways included in the present study, including (1) need frustration positively predicts IGD through intrinsic motivation, (2) need frustration positively predicts IGD through extrinsic motivation, and (3) need frustration negatively predicts IGD through amotivation. According to Hayes (2018), the indirect effect of the model could be interpreted as statistically significant when the range of value between the 95% bias-correlated confidence interval (CI) does not consist of the value of zero.

Chapter IV

Results

Data Cleaning

According to den Broeck et al. (2005), data cleaning, as an error prevention strategy, was one of the crucial and essential steps in data analyses to identify the presence of erroneous data, by making sure that the dataset contains no erroneous data by filtering out the invalid data. At the initial stage, there were a total of 1265 responses collected in the present study.

Irrelevant Data

According to Revilla and Ochoa (2017), the optimal duration to complete a survey was around 10 minutes. Thus, by filtering out 689 responses that did not reach a minimum duration of 10 minutes in answering the survey, there was a remaining total of 576 responses. The targeted population for the present study was Malaysians aged between 18 and 29, with at least one year of gaming experience in MOBA games. nine sets of data were recorded out from the age range, 32 sets of data were recorded as non-MOBA gamers, five responses from MOBA gamer respondents reported gaming experience lower than a year and three respondents were non-Malaysian, resulting in a total of 527 respondents retained.

Missing Data

Different scholars had concluded various thresholds of the number of missingness data before appraising the removal of the data (Madley-Dowd et al., 2019; Sekaran & Bougie, 2019). According to Jakobsen et al. (2017), datasets with more than 10% missing data were almost certainly biased. Thus, by filtering out 11 cases with lower than 90% completion, 516 sets of responses were remained and used for data analyses.

Normality Assumptions

Prior to the multiple regression analysis and mediation analysis, the data were checked through normality assumptions, including skewness and kurtosis, Kolmogorov-Smirnov test, probability-probability plot, as well as histogram.

Skewness and Kurtosis

According to Table 4.1, it was found that the values of skewness and kurtosis were within the desirable range which was ± 2, indicating no violation and the data were normally distributed (Mishra et al., 2019).

Table 4.1

Normality Assumptions: Skewness and Kurtosis

Variable	Skewness	Kurtosis
Need Frustration	– .333	– 0.333
Intrinsic Motivation	– .244	1.413
Extrinsic Motivation	– .078	.517
Amotivation	– .569	.286
IGD	– .172	– .646

Note. IGD = Internet gaming disorder.

Kolmogorov-Smirnov (K-S) Test

As shown in Table 4.2, violation of the assumptions was observed in all variables as the significant value indicating $p < .05$ for all the variables in the present study (see Appendix E). According to Demir (2022), a value of $p < .05$ indicated that the population was not normally distributed and there was a significant difference between the sample distribution and the normal distribution.

Table 4.2

Kolmogorov-Smirnov (K-S) test

Variable	Sig.
Need Frustration	< .001
Intrinsic Motivation	< .001
Extrinsic Motivation	< .001
Amotivation	< .001
IGD	< .001

Note. IGD = Internet gaming disorder.

Probability-Probability (P-P) plot

The plots of each variable observed cumulative probability scattered on the graph indicated that the sample data was normally distributed and were located approximately to the straight line of expected cumulative probability (see Appendix E). The pattern of the plots implied no violation of normality was observed.

Histogram

In the present study, the result of the histogram for each of the variables displayed a normally distributed result as all the histograms were in the bell-shaped distribution (see Appendix E). This indicated the assumption of normality for histogram was not violated.

Summary of Normality Assumptions

As mentioned by Demir (2022), the significant difference between the sample distribution and the normal distribution could be attributed to the big sample size. K-S test is considered as a test that has greater sensitivity toward its values and required small deviations for significant values (Ghasemi & Zahediasl, 2012). Thus, although all the variables in the K-

S test were revealed to be violating the assumption of normality, it can still be concluded that the normality assumptions were met in the present study given that violation of histograms, P-P plots and skewness and kurtosis were not observed.

Descriptive Statistics

There was a total of 516 responses after the process of data screening and cleaning to exclude the participants that were not fulfilling the inclusive criteria. As presented in Table 4.3, from the 516 participants, it was found that the mean age of sample respondent was 24 years old, with the vast majority of participants was males (n = 348) and followed by females (n = 168). According to Table 4.3, there was a vital disparity of participants in some demographic variables (e.g., race, relationship and employment status) specifically with the majority of the participants were Chinese (69.2%), in single status (62.2%) and were employed (67.2%).

In terms of participants' gaming frequency and duration in a week, it can be concluded that the majority of the participants reported as moderately involved in MOBA gaming which was 2 to 8 times (78.7%) and 5 to 10 hours (50.2%) per week. There was also a certain attention-worthy number of participants regarding their excessive gaming frequency and duration, which were 9 times and above (20.0%) and 11 hours and above (14.7%) as these showed a problematic gaming practice in daily life.

In the present study, the cut-off value of each of the main variables (i.e., IGD, need frustration, intrinsic motivation, extrinsic motivation, and amotivation) was determined through the calculation of the median to differentiate the variables into higher or lower levels. Based on the cut-off value, IGD (M = 26.21, SD = 6.66), as one of the main variables has recorded that more than half of the participants (n = 265) were categorised into a higher level of IGD and a similar proportion of participants with IGD that reflected accompanied with

significant level of need frustration. As for motivational types (i.e., intrinsic motivation, extrinsic motivation, and amotivation), participants were found to achieve more than half for each motivational type. In short, extrinsic motivation (M = 52.96) revealed the superior motivation effect among intrinsic motivation (M = 14.98) and amotivation (M = 12.72).

Table 4.3

Frequency Distribution of Demographic Variables and Main Variables

	n	%	*M*	*SD*
Demographic Variables				
Age			24.00	2.69
Gender				
Male	348	67.40		
Female	168	32.60		
Relationship status				
Single	321	62.20		
Married	73	14.10		
In relationship	122	23.60		
Race				
Malay	102	19.80		
Chinese	357	69.20		
India	54	10.50		
Others	3	0.60		
Employment status				
Employed	347	67.20		
Unemployed	20	3.90		

Table 4.3

Frequency Distribution of Demographic Variables and Main Variables (Continued)

	n	%	*M*	*SD*
Others	149	28.90		
MOBA gamer				
Yes	516	100.0		
No	0	0		
Educational level				
Secondary School/ Pre-U	91	17.60		
Diploma	180	34.90		
Bachelor's degree	224	43.40		
Postgraduate degree	21	4.10		
Gaming frequency (per week)				
0 – 1 time	7	1.40		
2 – 4 times	164	31.80		
5 – 8 times	242	46.90		
9 times and above	103	20.00		
Gaming duration (per week)				
1 hour and below	14	2.70		
2 to 4 hours	167	32.40		
5 to 7 hours	147	28.50		
8 to 10 hours	112	21.70		
11 hours and above	76	14.70		

Table 4.3

Frequency Distribution of Demographic Variables and Main Variables (Continued)

	n	%	*M*	*SD*
Gaming experience (in years)				
1 to 3 years	67	13.00		
4 to 6 years	202	39.10		
7 to 9 years	121	23.40		
10 years and above	126	24.40		
Starting age			16.09	4.50
Main variables				
IGD			26.21	6.66
Low (< 27)	251	48.60		
High (≥ 27)	265	51.40		
Need Frustration			38.23	8.21
Low (< 39)	251	48.60		
High (≥ 39)	265	51.40		
Intrinsic Motivation			14.98	2.68
Low (< 15)	241	46.70		
High (≥ 15)	275	53.30		
Extrinsic Motivation			52.96	9.97
Low (< 52)	251	48.60		
High (≥ 52)	265	51.40		

Table 4.3

Frequency Distribution of Demographic Variables and Main Variables (Continued)

	n	%	*M*	*SD*
Amotivation			12.72	3.89
Low (< 13)	225	43.60		
High (≥ 13)	291	56.40		

Note. $N = 516$.

Multiple Linear Regression (MLR) Assumptions

Independent

According to Berry (1993), it was assumed that the responses from any participants were independent of the other participants. This assumption was met since the data collected in the present study from the participants were independent.

Types of Variables

All variables in the study have to be continuous variables to utilize multiple linear regression analysis. Hence, the assumption was met as all the variables used in the present study were continuous variables.

Independence of Errors

The Durbin-Watson test was used to examine the presence of independence of errors in the present study (see Appendix F). According to Champion et al. (1998), the benchmark for this test was between 1 and 3 and it was suggested that the closer to 2, the higher the congruence to the assumption (Reddy & Sarma, 2015). Table 4.4 showed that the assumption of independence of errors was met as the value was 1.808.

Table 4.4

Independence of Errors (Durbin-Watson)

Model	Durbin-Watson
1	1.808

Note. Predictors: Need Frustration, Intrinsic Motivation, Extrinsic Motivation and Amotivation; Dependent Variable: IGD

Multicollinearity

In the Multiple Linear Regression (MLR) model, multicollinearity was measured by using the Variance Inflation Factor (VIF) and tolerance (see Appendix F). In order to meet the assumption, tolerance values have to exceed the value of .10 (Daoud, 2017; Bager et al., 2017) while the VIF value have to be smaller than 10 (Hair et al., 2009; Shrestha, 2020). As shown in Table 4.5, multicollinearity was not identified in the present study.

Table 4.5

Collinearity Statistics

	Tolerance	VIF
Need Frustration	.699	1.431
Intrinsic Motivation	.790	1.266
Extrinsic Motivation	.694	1.440
Amotivation	.703	1.422

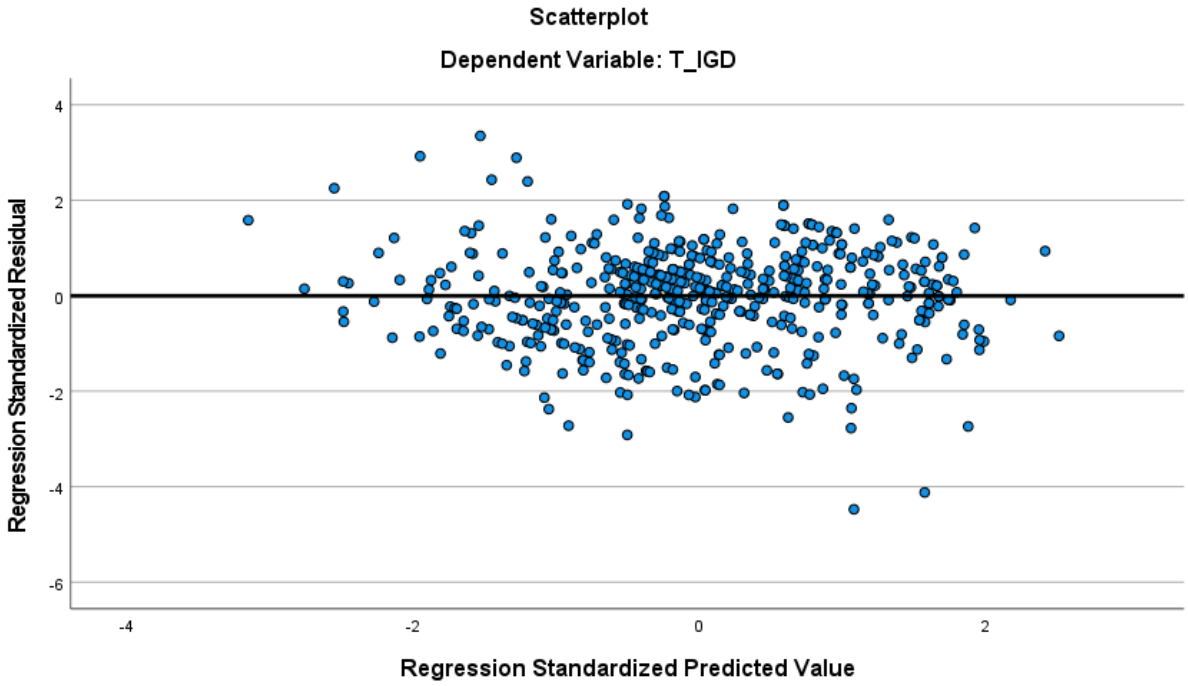
Note. Predictors: Need Frustration, Intrinsic Motivation, Extrinsic Motivation and Amotivation; Dependent Variable: IGD

Normality of Residuals, Linearity and Homoscedasticity

Scatterplot was used to examine the normality of residuals, linearity and homoscedasticity. Figure 4.1 illustrated that the residuals were randomly and evenly distributed along the zero line around the zero or horizontal line (Field, 2009). Therefore, the assumption of normality of residuals, linearity and homoscedasticity were met in the present study.

Figure 4.1

Normality of residuals, linearity and homoscedasticity among variables



Multivariate Outliers

In order to check multivariate outliers, three measures were adopted, including Cook's distance (Cook & Weisberg, 1982), Mahalanobis distance (Barnett & Lewis, 1994) and Centered Leverage Value (Hoaglin & Welsch,1978). By using the standard deviation of

two, it was demonstrated that 25 cases were potentially labelled as multivariate outliers (see Appendix F).

From the total of 25 cases, none of it was found to violate Cook's distance, or Mahalanobis distance as all the cases were not included as residual statistics. Concurrently, as showed in Table 4.6, the centered leverage value with the benchmark of .019, which was calculated from the equation of $2 \times \left[\frac{(4+1)}{516}\right]$, was violated by three cases, including cases 194, 356 and 445 (Hoaglin & Welsch,1978). However, these three cases were not removed since another two assumptions, which were Mahalanobis distance as well as Cook's distance were not violated. Thus, no multivariate outlier was found and none of the cases were removed.

Table 4.6

Multivariate Outliers

Case Number	Mahalanobis Distance	Cook's Distance	Centered Leverage Value
1	9.309	.032	.018
6	8.854	.018	.017
14	5.598	.020	.011
44	9.610	.073	.019
46	1.967	.007	.004
57	5.338	.028	.010
165	1.601	.004	.003
185	1.408	.004	.003
194	13.974	.035	.027
200	3.497	.008	.007
201	2.267	.011	.004
223	2.209	.007	.004

Table 4.6

Multivariate Outliers (Continued)

Case Number	Mahalanobis Distance	Cook's Distance	Centered Leverage Value
251	1.259	.004	.002
257	3.776	.008	.007
258	3.776	.008	.007
260	1.380	.008	.003
287	2.567	.006	.005
344	9.046	.022	.018
356	12.207	.027	.024
417	2.460	.010	.005
419	2.427	.006	.005
435	0.665	.003	.001
445	15.522	.059	.030
464	2.493	.009	.005
516	4.225	.041	.008

Note. $n = 25$.

Inferential Statistics

Multiple Linear Regression (MLR) Analysis

In the current study, multiple regression analysis was utilised to examine if need frustration, intrinsic motivation, extrinsic motivation and amotivation significantly predict IGD (see Appendix F). According to the results shown in Table 4.7, the model was statistically significant, $F(4, 511) = 124.731$, $p < .001$ and accounted for 49.0% of the variance. Need frustration ($\beta = .469$, $p < .001$) was found to be the strongest positive

predictor of IGD, followed by extrinsic motivation (β = .229, $p < .001$), and amotivation (β = .186, $p < .001$). However, intrinsic motivation did not have a significant predictive effect on IGD (β = .006, $p = .889$). Thus, hypotheses 1, 3 and 4 were supported, while hypothesis 2 was not supported.

Table 4.7

Predictors of IGD among Malaysian Youth

Dependent Variable	Predictor Variable	β	*t*	Sig.
IGD	NF	.469***	12.448	< .001
	IM	.006	.173	.863
	EM	.229***	6.076	< .001
	AM	.186***	4.958	< .001

Note. $N = 516$. IGD = Internet gaming disorder; NF = Need Frustration; IM = Intrinsic Motivation, EM = Extrinsic Motivation, AM = Amotivation.

***$p < .001$

Mediation Analysis

The direct, indirect and total effects of need frustration, gaming motivations (i.e., intrinsic motivation, extrinsic motivation and amotivation) and IGD were conducted using PROCESS macro. Model 4 was adopted under the PROCESS macro, which focuses on the bootstrapping method to examine the mediating effect of gaming motivations on the association between need frustration and IGD's (see Appendix G). The number of bootstraps was set at 1000, with the level of confidence intervals at 95%. According to Hayes (2018), an

indirect effect of mediation was statistically supported when the confidence interval (CI) based on the bootstrap samples does not have the presence of zero.

Alwin and Hauser (1975) proposed two measures to calculate the decomposition of effects in path analysis, including calculating the ratio of indirect effect to total effect as the first measure, and the ratio of direct effect to the total effect as the second measure. Below were two formulas for both measures, calculating the ratio of indirect effect to total effect and ratio of direct effect to total effect respectively, with *a* representing slope connecting the independent variable to the mediator, *b* representing the conditional slope linking the mediator to the outcome variable, *c* representing the total effect of the independent variable on the outcome variable and *c'* representing the conditional slope linking the independent variable to the outcome variable.

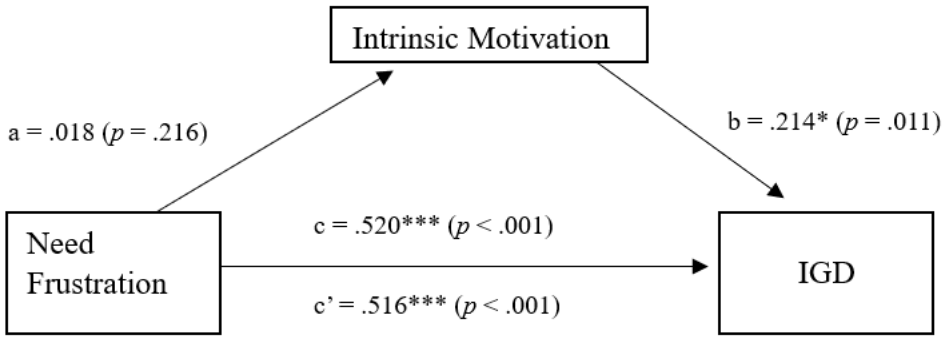
$$P_M = \frac{\text{ab}}{\text{ab}+c\prime} = \frac{\text{ab}}{c}$$

$$1 - P_M = 1 - \frac{\text{ab}}{\text{ab}+c\prime} = 1 - \frac{\text{ab}}{c}$$

Need Frustration, Intrinsic Motivation and IGD. Figure 4.2 revealed that intrinsic motivation had a significant effect on IGD, $B = .214$, $SE = .084$, $t = 2.554$, $p = .011$, 95% CI [.050, .379]. The direct effect of need frustration on IGD was statistically significant, $B = .516$, $SE = .027$, $t = 18.860$, $p < .001$, 95% CI [.463, .570]. The indirect effect of need frustration on IGD via intrinsic motivation was observed to be not significant, $B = .004$, $SE = .004$, 95% CI [– .003, .136]. The ratio of the indirect effect to the total effect was .007 and the ratio of the direct effect to the total effect was .993. The results did not support that intrinsic motivation mediates the association between need frustration and IGD. Thus, hypothesis 5 was not supported.

Figure 4.2

Mediation effect of intrinsic motivation on need frustration and IGD



Note. $N = 516$. Simple mediation diagram: a, b, c and c' were path coefficients representing unstandardized regression weights and *p*-value (in parentheses). The c path coefficient represented the total effect of need frustration on IGD. The c-prime path coefficient referred to the direct effect of need frustration on IGD. All analysed paths were significant except a path.

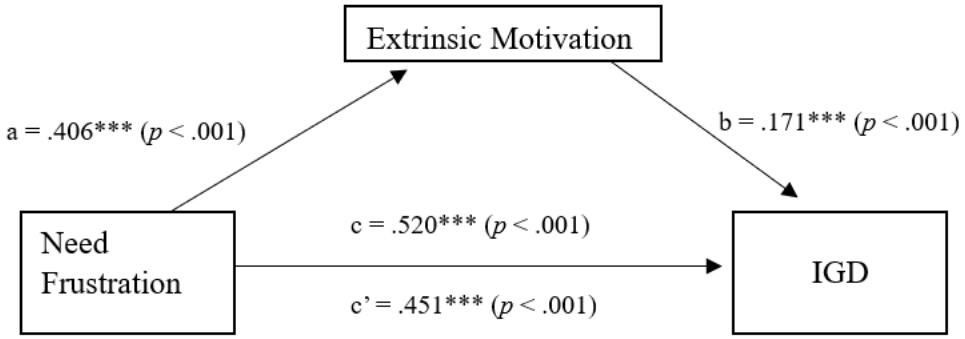
*$p < .05$, ***$p < .001$.

Need Frustration, Extrinsic Motivation and IGD. According to the results shown in Figure 4.3, after controlling the effects of extrinsic motivation, it was found that extrinsic motivation had a significant effect on IGD, $B = .173$, $SE = .023$, $t = 7.512$, $p < .001$, 95% CI [.127, .216]. The direct effect of need frustration on IGD was statistically significant, $B = .451$, $SE = .028$, $t = 16.272$, $p < .001$, 95% CI [.397, .505]. The indirect effect of need frustration on IGD through extrinsic motivation was statistically significant, $B = .070$, $SE = .015$, 95% CI [.042, .102]. The ratio of the indirect effect to the total effect was .134 and the ratio of the direct effect to the total effect was .866. The results supported that extrinsic

motivation possess mediating effect on the association between need frustration and IGD. Therefore, hypothesis 6 was supported.

Figure 4.3

Mediation effect of extrinsic motivation on need frustration and IGD



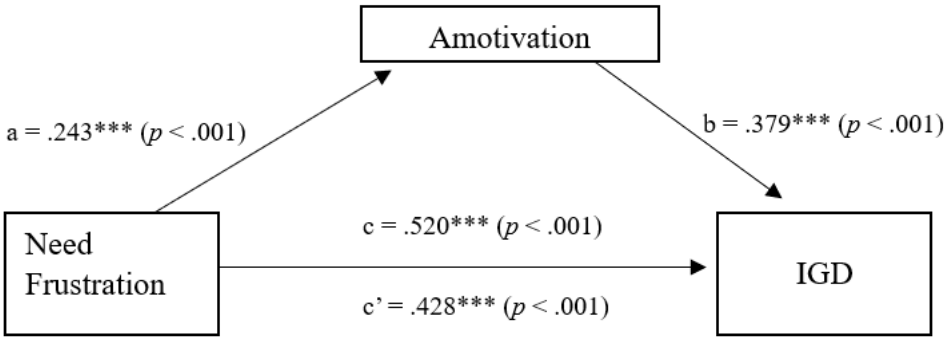
Note. N = 516. Simple mediation diagram: a, b, c and c' were path coefficients representing unstandardized regression weights and *p*-value (in parentheses). The c path coefficient represented the total effect of need frustration on IGD. The c-prime path coefficient referred to the direct effect of need frustration on IGD. All analysed paths were significant. ****p* < .001.

Need Frustration, Amotivation and IGD. As shown in Figure 4.4, after controlling the effects of amotivation, it was found that amotivation had a significant effect on IGD, *B* = .380, *SE* = .066, *t* = 5.789, *p* < .001, 95% CI [.250, .508]. The direct effect of need frustration on IGD was statistically significant, *B* = .428, *SE* = .031, *t* = 13.794, *p* < .001, 95% CI [.367, .489]. The indirect effect of need frustration on IGD's through amotivation was statistically significant, *B* = .092, *SE* = .017, 95% CI [.059, .126]. The ratio of the

indirect effect to the total effect was .177 and the ratio of the direct effect to the total effect was .823. The results supported that amotivation is a mediator on need frustration and IGD.

Figure 4.4

Mediation effect of extrinsic motivation on need frustration and IGD



Note. $N = 516$. Simple mediation diagram: a, b, c and c' were path coefficients representing unstandardized regression weights and *p*-value (in parentheses). The c path coefficient represented the total effect of need frustration on IGD. The c-prime path coefficient referred to the direct effect of need frustration on IGD. All analysed paths were significant.

***$p < .001$.

Chapter V

Discussion

H1. Need Frustration Positively Predicts IGD among MOBA Malaysian Youth.

Based on the result, the first hypothesis was supported as need frustration was proven to be a significant predictor of IGD among MOBA Malaysian youth. The present study was consistent with some past studies (Allen & Anderson, 2018; Hui et al., 2019; Mills & Allen, 2020) which concluded need frustration as a positive predictor of IGD.

The possible reason to explain need frustration as a significant predictor of IGD was that MOBA games could serve as a substituting compensator when basic psychological needs were being frustrated in real-life (Chamarro et al., 2020). For instances, players with low level of satisfaction in their real-life situation, such as possessed the feeling of inferior towards others (competence frustration), being forced to behave and act in ways without corresponding to their willingness or feel being controlled and pressured (autonomy frustration) and loneliness due to absence of social interaction with family or friends (relatedness frustration) will lead them to develop IGD due to the uncontrollable demands increased from the reality by deriving online resources (Chamarro et al., 2020; Mills et al., 2021).

There were few studies indicated that gamers with basic psychological needs were predisposed to lower level of self-control and self-esteem, at the same time evoking the increased of depressive symptoms throughout their real life which led the gamers likely to be addicted in Internet gaming unconsciously (Beard & Wickham, 2016; Mills & Allen, 2020; Vuorinen et al., 2022). In simpler words, need frustration was highly associated with psychological distress in real life (Hagfors et al., 2023). Consequently, MOBA games became one of the important platforms which allowed players to relieve their need frustration in real

life which in turn fostered the gamers' willingness to spend more time in virtual reality (Allen & Anderson, 2018; Liao et al., 2020). In shorts, players were being drained into a negative cycle by immersing in the virtual life to gain compensate the frustrated psychological needs through Internet gaming. Hence, excessive frequency and time-spend in MOBA games would increase when the demands of recompensing frustrated basic psychological needs augmented, yielding to lack of control, eventuating the development of IGD (Kuźma et al., 2020; Mills et al., 2018).

Another possible reason for need frustration to have a positive predicting effect on IGD was that MOBA games could increase players' level of gratification, but unable to solve the threats in real-life although Internet gaming behaviour was used as a coping mechanism to compensate frustrated basic psychological needs (Chamarro et al., 2020; Mills et al., 2017; T'ng & Pau, 2020). In view of the self-value being acknowledged through games, players would offer increased amount of time to repeatedly delight in the feeling of flow (Kuźma et al., 2020). Thus, it was unavoidable to concede that real life issues remained to threaten basic psychological needs of players regardless of the momentary relaxes that players could experience in MOBA games (Charmarro et al., 2020; T'ng & Pau, 2020). Therefore, MOBA games intensified the gamers behaviours of escaping real life when basic needs were being threatened, on the other hand, being drained into consistent loop despite acknowledging that real-life issues persist, gives rise to cultivating IGD.

H2. Intrinsic motivation positively predicts IGD among MOBA Malaysian youth.

Based on the result, it was shown that intrinsic motivation was not a significant predictor of IGD among MOBA Malaysian youth. Therefore, the second hypothesis was not supported. In contrast with various conducted past studies (e.g., Birk et al., 2016a; Birk et al., 2016b; Przybylski et al., 2012; Gomez et al., 2022; King et al., 2017; Reid, 2012), intrinsic

motivation was claimed to underline one's engagement in leisure activities solely for its enjoyment or satisfaction such as Internet gaming, which was likely to increase problematic gaming behaviour.

The inconsistency of the findings might stem from individual differences in ability in controlling the intensity of engagement in MOBA games. Intrinsic motivation was posited to integrate with higher level sense of control, signifying that players possessed greater level of autonomy to opt frequency of in-game engagement rather than serving with a purpose (Beard & Wickham, 2016). From that, with competence in self-dominating the inclusion in games, gamers' psychological well-being was postulated to be fostered, leading to a reduced risk to culminating problematic gaming behaviours (Gomez et al., 2022; Király et al., 2023; Mills & Allen, 2020).

According to Arbeau et al. (2020), there was a stereotypic view from MOBA gamers in labelling Internet games as social incompetence, unpleasant and worthless in their real-life. Nevertheless, to a certain level of self-control, gamers were found to be enjoying, relaxing in games, and recorded increase in self-confidence when engaged in Internet games (Arbeau et al., 2020; Bäcklund et al., 2022; Burgers et al., 2015). Accordingly, the sense of control undermined the impact of intrinsic motivation to excessively participate in Internet gaming, lowered down the risk to progress into IGD. For instance, Beard and Wickham (2016) conducted a study and found that the participants viewed Internet games as an extension to experience novel and unique virtual world, thus, exhibit higher degree of control in regulating time spent in Internet games. As a result, without channelled into the hazardous cycle of excessive gaming, the detrimental outcome (i.e., IGD) could be avoided. Hence, it was inferred that intrinsic motivation contribute to sense of control, by undermining the risk of culminating IGD.

H3. Extrinsic motivation positively predicts IGD among MOBA Malaysian youth.

In the current study, it was showed that extrinsic motivation was significantly and positively predicting IGD. Thus, the hypothesis was supported. This finding was congruent with few previous studies that examined the predictive effect of extrinsic motivation on IGD which concluded the positive predictive effect of extrinsic motivation on IGD (Beard & Wickham, 2016; Khan & Muatadir, 2016; Mills & Allen, 2020; Mills et al., 2018). Particularly, it was concluded that adverse consequences (i.e., IGD) were more likely to be experienced when extrinsic motivation was boosted by amplified external drives due to their excessive passion towards internet gaming behaviour (Mills & Allen, 2020; Seguin-Levesque et al., 2003).

Congruently, a meta-analysis conducted by Bäcklund et al. (2022) depicted that the external rewards to induce repeated gaming behaviour could be derived from various sources, including competitiveness, achievement (i.e., reward-seeking behaviour), social factors (i.e., social acceptance, peer pressure and social involvement) and escapes from reality. Concurrently, players' motivation to be repeatedly involved in games was indicated to be reinforced in MOBA matches in terms of social interaction and meaningful competition with battled competitors (Bonny & Castaneda, 2022), as well as drives to immerse oneself in MOBA games which could serve as avoidance tool from hardships and difficulties faced in real-life (Bäcklund et al., 2022; Melodia et al., 2022).

According to Chamarro et al. (2020), players would have a greater likelihood to encounter IGD through the reward-seeking behaviours in Internet games. Particularly, MOBA games offered a virtual arena, whereby competitions would happen between players across the world, providing chances for gamers to develop social connections with other players (Bonny & Castaneda, 2022; Melodia et al., 2022). As result, achievements and

triumphs, as well as smooth social interactions gotten from the battles and games would be highly regarded, which in turn developed self-concept (i.e., strong personalised characters) among players (Beard & Wickham, 2016; Rasheed et al., 2022).

Connectedly, Kou et al. (2018) assessed that streakiness (i.e., winning streaks in battles) in MOBA games was essential in interfering with gamers' perception of their self-competency. These could serve as reinforcers in obtaining the preferred or desired outcomes (e.g., winning to increase self-confidence) through Internet gaming, leading to a cycle of repetitive in Internet gaming behaviours and eventually stimulating IGD through a process of reinforcement (Bonny & Castaneda, 2022). Thereby, players would exhibit higher intentions due to the appealing and attracting features of MOBA games, as well as recognition that they could gain from the games. As a result, these could intensify the reliance on Internet games, particularly on MOBA games, that could precipitate the development of IGD (Allen & Anderson, 2018; Beard & Wickham, 2016).

H4. Amotivation positively predicts IGD among MOBA Malaysian youth.

Based on the findings, amotivation was found to have significant and positive predictive effect on IGD. Thus, the hypothesis was supported. The result confirmed past studies that concluded amotivation as a positive predictor of IGD (Beard & Wickham, 2016; Çırak & Erol, 2020; Mills & Allen, 2020). Notably, players that continued to engage in MOBA games would have a greater chance to culminate maladaptive outcomes (i.e., IGD) despite expressing amotivation towards the games. According to Király et al. (2022), those who committed in Internet gaming even if driving by amotivation (i.e., not receiving substantial good reason to compel) were with a greater likelihood to be negatively affected.

Correspondingly, Mills and Allen (2020) depicted that amotivation would be precipitated by strong sense of lack of volition when individuals choose to engage in an

activity despite the absence of urge to be involved in. This could lead to deprivation of self-control among players, even if they were aware of the detrimental outcomes of excessive involvement in Internet games (Bäcklund et al., 2022). Consequently, the loss of sense of control would induce recurrent and repetitive involvement in Internet gaming due to impotent in getting rid of Internet gaming behaviours, resulting in negative affective state, prompting the development of IGD.

Furthermore, Khalafi (2021) outlined that it was possible that players were initially enjoyed and felt delighted in Internet games, however, eventually alternating into an aimless playing purpose overtime. This was probably a consequence of excessive time spent on Internet gaming, resulting in masking of value of enjoyment and betterment of Internet gaming that one may perceive beforehand. In fact, as presented by Tyack et al. (2016), MOBA players frequently choose to stop playing as the games were no longer entertaining and enjoyable to them. Nevertheless, to alleviate the sense of emptiness, players would still participate in games as the sense of loss of control overshadowed the consciousness that the game no longer entertaining and amusing. Hence, the excessive engagement in Internet gaming was depicted to reinforce the essential will of players to play games, which in turn pertaining indispensable and detrimental outcomes, particularly, IGD (Çırak & Erol, 2020; Király et al., 2022; Mills & Allen, 2020).

H5. The association between need frustration and IGD is mediated by intrinsic motivation among MOBA Malaysian youth.

In the present study, intrinsic motivation was suggested as a mediator. However, it was not found to be a significant mediator to need frustration and IGD. Thus, this hypothesis was not supported. This conveyed that the association between need frustration and IGD was not on account of players genuine enjoyment and interest towards MOBA games. In other

words, need frustration was found to precipitate IGD among MOBA players despite the uncertain influence of intrinsic motivation. The result was inconsistent with previous studies that examined that mediating effect of intrinsic motivation on need frustration and IGD (Mills & Allen, 2020; Mills et al., 2018; Radel et al., 2014).

Ryan et al. (2006) reported that with high level of need frustration, players' enjoyment towards games was expected to be lowered, thusly, exhibiting no intrinsic motivation to enjoy the games. According to Deci and Ryan (1985), Internet games could be helpful in compensating all the three psychological needs that have been obstructed. Nevertheless, MOBA games was posited to not to induce high levels of intrinsic motivation in players despite knowing that games were challenging (compensating competence frustration), controllable (compensating autonomy frustration) and fostering social relationships with other players compensating autonomy frustration), which could flourish the feeling of flow in players (Allen & Anderson, 2018; Arbeau et al., 2020).

On top of that, a potential explanation that intrinsic motivation does not place a mediating role on the association between need frustration and IGD is due to undermining effect of extrinsic motivation towards intrinsic motivation. Specifically, this can be described by over-justification effect in motivation (Deci, 1971; Maimaran. & Fishbach, 2014; Murayama et al., 2010). An experiment conducted by Hong et al. (2022) to examine undermining effect of external reward concluded that participants were revealing a significant decrease in enthusiasm for game engagement. Likewise, A meta-analysis conducted by Lehtivuori (2023) indicated that extrinsic motivation would impede and undermine intrinsic motivation when external rewards were delivered in condition of task engagement, task performance, and task completion.

Deci and Ryan (1985) highlighted that one would lose the sense of control towards pertaining a particular behaviour when external rewards got involved. By integrating the substantiated presumption into the present study, the players might perceive external rewards (e.g., accomplishments in games, online social interactions) as the source of compensating need frustration rather than fully enjoying and delighting in MOBA battles. As such, the withdrawal of the reward could lead to diminishing of intention of one to involve in the activity (Deci et al., 2001). Thus, it could be perceived that the motivation to involve in MOBA games of players relied on extrinsic motivation rather than intrinsic motivation, whereby need frustration is likely to increase gaming hours, which could lead to development of IGD without being controlled, as compared to intrinsic motivation.

H6. The association between need frustration and IGD is mediated by extrinsic motivation among MOBA Malaysian youth.

According to the result, this hypothesis was supported and confirmed several studies that unveiled that extrinsic motivation as the mediator between need frustration and IGD (Chamarro et al., 2020; Lemmens & Weergang, 2023; Li et al., 2021; T'ng et al., 2022). Extrinsic motivation was perceived as a symbolize that aid in motivating the gamers along with compensating the basic psychological needs (i.e., autonomy, competence, and relatedness) that incapable to acquire in real life settings which resulted in sense of frustration and deprivation.

The present study disclosed that the engagement in problematic gaming practices was resulting from the deprivation of the need of autonomy in the actual world, thus, there was a need for the MOBA gamers to retrieve their wills and freedom through engaging in Internet gaming. According to Allen and Anderson (2018), the invention of the gaming characteristics tends to fulfil the needs of gamers in exhibiting their greater authority and domination toward

the virtual life events which incapable in real world. For instance, need of autonomy that restricted by the illimitable oppression of the rule and regulations could result in the sense of loss of one's freedom, which tend to increase the susceptibility of IGD so that to compensate the loss of need autonomy in gaming realm (Bäcklund et al., 2022; T'ng et al., 2022). To elaborate, this might stem from gamers' immense freedom and privileges that were absent in reality which then led to a state flow or an optimal experience in virtual Internet game environment, to foster temporary psychological relief (Li et al., 2021). Thereby, the gamers who were extrinsically motivated likely to be involved in excessive gamely in order to get rid of autonomy frustration.

Apart from the need of autonomy, the present study also postulated that the gamers pursued a sense of competence and accomplishment through gaming practices as the result of taking possessions of real-life stressors and the level competitiveness among in-game players. Undoubtedly, in the realm of Internet gaming, particularly, MOBA genre, certain extend of privileges or authorities would be possessed by the player whom ability was affirmed, whereas those who have been underestimated or disregarded might not be able to own their superiority and sense of achievement (Bussone et al., 2020; Liao et al., 2020b; Rasheed et al., 2022). Thus, the objective of gaining and retaining the sense of achievement tends to be fulfilled through engaging in gaming behaviour when completing the missions and flattering other gamers. According to Carlisle et al. (2019), they have concluded that the engagement of youth, especially male in problematic gaming practices were highly precipitated by the achievement-related frustration which resulted in seeking accomplishment satisfaction as well as sense of honour in virtual world. Thereupon, gamers who reported competence frustration have higher susceptibility to engage in excessive gaming behavior, with higher plausibility to progress into IGD.

Concurrently, extrinsic motivation comprised of the pursuit of the sense of relatedness and belonging which played a role in determining the severity of IGD. In a matter of fact, the present study revealed that relatedness frustration tends to enhance the engagement in problematic gaming practices by owing to compensate the frustration of needs of social connection and the fear of isolation. Substantially, relatedness frustration was confronted by those who were introvert, lack of expression or communication skills and scarcity of social support which could result in the belonginess seeking through virtual environment that rich in privateness which further provide personal spaces to gamers, leading to problematic gaming practices (Celik et al., 2022; Pui et al., 2019; Yang et al., 2020; Zhang et al., 2019). According to Yang and Liu (2017), the objective of engaging in gaming was for widely projection of social network along with minimising the undesired feeling such as loneliness and the sense of low presence. Thence, relatedness frustration precipitated on the excessive of engagement and IGD among gamers through betterment of extrinsic motivation.

H7. The association between need frustration and IGD is mediated by amotivation among MOBA Malaysian youth.

Based on the data analysis of present study, this hypothesis was supported, and it was substantiated by numerous of studies that concluded the mediating effect of amotivation between need frustration and IGD (Bäcklund et al., 2022; Gomez et al., 2022; Mills & Allen, 2020). In regard to amotivation that indicated as the absence of intrinsic and extrinsic motivation in engaging the gaming practices, it was triggered by the state of need frustration and deprivation which then engendered on the sense of lack of internal locus of control toward the life events (Mills & Allen, 2020). According to Mills et al. (2018), need frustration would provoke the ideation of escapism or suppresses on undesired affection, which then led to the problematic gaming practices, with amotivation served as the mediating role. This can be further explained by the confusion that the gamers with IGD failed to

actively regulate their problematic gaming practices since they were being mastered by coping mechanisms that conceal the actual thoughts which further lead to the excessive engagement in gaming without intentional motivation (Banyai et al., 2019; Chang & Lin, 2019). Therefore, it can be postulated that the gamers unconsciously perceived gaming as the means for escaping from reality deprivation which eventually proven the mediating effect of amotivation.

In addition, amotivation could enhance the desire of gamers to engage in problematic gaming practices unintentionally and ultimately, the excessive behaviour transformed into an indispensable habit among the gamers. In fact, frustration experienced by the gamers in nowadays competitive and fast-paced world tends to increase a sense of trepidation or other psychological symptoms which subsequently reinforced problematic gaming practices for dispersion purposes. According to Çırak and Erol (2020), they illustrated that the gamers consciously reject and resist renouncing their problematic gaming habit despite the realisation of the negative outcomes. Indeed, the mediating effect of amotivation between the association of need frustration and IGD tends to deteriorate the gamers' psychiatric conditions such as exacerbation of anxiety or the degree of stress toward their need frustration (Király et al., 2022; Peracchia et al., 2019). Hence, it can be posited that need frustration could result in the problematic gaming practices as the gamers take this behaviour as the habit that was vitally essential in their life and structured an attachment with it.

Likewise, gamers with higher level of amotivation were more likely to be perceived as having low self-control and self-determination in their gaming behaviours (Cudo et al., 2020; Cudo et al., 2022; Lin et al., 2021a; Sun et al., 2022). According to Çırak and Erol (2020), problematic gaming practices that associated to amotivation was generally owing to the minor degree of self-discipline and the concerns of powerlessness in dominating the undesired gaming practices. Gamers were prone to give credence to the truth that the

diminishing of internal locus of control which led them to feel incapable and vulnerable to influence by external drives. Thus, the gamers persisted in the problematic gaming practices due to frailty in making behaviour changes and this causes the formation of a cycle which amotivation as a gearwheel that connected to the frustration of self-control and problematic gaming practices.

Implication

Theoretical Implication

Self-Determination Theory (SDT) which developed by Ryan and Deci (1985) was applied in the study to study the mediating effect of gaming motivations on the association between need frustration and IGD, emphasizing spectrum of motivations in engaging in activities. The present study had contributed more on the understanding of need frustration and IGD among MOBA Malaysian youth, concurrently, providing more future research directions as there were limited studies conducted that focused on MOBA youth as well as the detrimental effect of need frustration on IGD (Chamarro et al., 2020; Kosa & Uysal, 2021). Hence, the current study had widened the understanding of IGD with the theoretical support of SDT in Malaysia context.

On top of that, the present study had found that extrinsic motivation and amotivation were significant mediators in the association between need frustration and IGD. Concurrently, intrinsic motivation was found to be not mediating the relationship between need frustration and IGD. The result revealed a disparity direction as suggested in the SDT, which stated that all the motivations (i.e., intrinsic motivation, extrinsic motivation, and amotivation) served as drives of behaviours in different intensity. Similarly, there were past studies that evidenced that intrinsic motivation possessed a significant role of either predictor

of IGD or mediator between need frustration and IGD (Birk et al., 2016b; Gomez et al., 2022; Mills & Allen, 2020; Mills et al., 2018; Radel et al., 2014; Wan & Chiou, 2007).

Nevertheless, although SDT theory signified that all the three spectrums of motivations (i.e., intrinsic motivation, extrinsic motivation and amotivation) were impacting one's intention to involve in activities, there would be some exception cases whereas the overjustification effect occurred, in condition that external rewards override the occurrence of intrinsic motivation (Deci, 1971). The non-significant mediating effect of intrinsic motivation on IGD could be due to the undermining impact of external rewards towards intrinsic motivation. Those concentrating on external drives (e.g., social interactions, triumphs, in-game characters growth) would occupy higher level of sense of control, subsequently allowed them to refrain from being drawn into excessive and problematic gaming behaviours (Bread & Wickham, 2016; Deci, 1971; Maimaran et al., 2014; Murayama et al., 2010; Safarina & Halimah, 2019). Thus, the result had shed light on examining the significance of undermining effect of extrinsic motivation over intrinsic motivation in the context of IGD.

Moreover, in accordance with the proposed SDT theory, the present study affirmed that extrinsic motivation and amotivation were predicting IGD, concurrently, serving as mediators between need frustration and IGD. The results were aligned with few previous studies that had been conducted (Bäcklund et al., 2022; Chamarro et al., 2020; Gomez et al., 2022; Lemmens & Weergang, 2023; Li et al., 2021; Mills & Allen, 2020; T'ng et al., 2022). Nevertheless, some of the past studies that conducted in Western countries showed that amotivation negatively predicts IGD (Brühlmann et al., 2020; Peracchia et al., 2019). Therefore, the present study could provide a new insight for the future researchers to future investigate culture differences as covariate variable.

In summary, the present study had provided different insights and plausible etiologies for the researchers to further investigate the association between need frustration, gaming motivations and IGD, in addition to covariate variables or confounding variables in MOBA genres, grounded in the SDT theory.

Practical Implications

The present study had provided an enhanced understanding on the roles of need frustration (i.e., autonomy, competency, and relatedness) and gaming motivation (i.e., intrinsic motivation, extrinsic motivation, and amotivation) on IGD among MOBA Malaysian youth. Therefore, the current study could impart to public on adverse and detrimental outcomes that could be associated with problematic gaming behaviours, which was the development of IGD.

In addition, the present study had concluded that higher level of need frustration could provoke IGD at a higher possibility. Thus, as prevention method, in order to ascertain healthy gaming behaviours, it was inferred that autonomy, competency and relatedness frustration should not be threatened (Allen & Anderson, 2018). Various parties, such as Ministry of Health Malaysia (MOH), parents, teachers, and professionals such as psychologists and counsellors should pay more attention and attentively corporate together to reduce the risk of gamers in developing IGD. Therefore, implementation of preventive programmes that educate individuals on effective ways to cope with need frustration (i.e., enhance real-life social interactions and connections), rather than immersed in Internet gaming could distance them from compensating all the basic psychological needs that had been threatened.

Next, apart from taking preventive steps, interventions strategies would be helpful in addressing needs of players who had diagnosed with IGD. It was important to tackle the maladaptive coping mechanisms of individuals, in order to evade further compulsion and

fixation on MOBA games, which could deteriorate the development of IGD. Thus, mental health professionals could be supportive in assisting them to identify and acknowledge the presence of the symptoms, explore different alternatives of coping mechanisms, concurrently, behave on course of logical judgements. As results, outcome of treatments of IGD could be guaranteed by implementing evidence-based treatments, such as cognitive behavioural therapy, motivational enhancement therapy (Zajac et al., 2017).

In addition, in view of the significant predicting effect of extrinsic motivation on IGD, reducing external rewards (i.e., positive reinforcement) could be helpful in regulating in-game durations. In simpler words, extrinsic motivation serves as an important key feature for players to stay attentive, thus, diminishing the positive reinforcement could intentionally decreased the in-game duration, consequently, trimmed the risk of getting IGD down. Game producers could collaborate in the intervention by minimizing or lessening in-game incentives such as “win item”, “powers” and “points” once the players had found to be excessively engaging in Internet gaming.

Limitations

Inevitably, there were several limitations that were found in the present study that could call attention from future researchers to be conscious of. Primarily, the application of self-report questionnaires in present study was considered as a subjective reporting method. Owing to the nature of self-reporting format, it possessed the probability to lead to a degree of response self-bias, which could result in the issue of generalization. Undeniably, individuals possessed independent and incompatible perspective towards the degree in assessing their psychological state that was listed in the self-report survey. Thus, this might precipitate certain issues that were prone to influence on the reliability of the result such as the attempt to act in socially acceptable and desirable ways (i.e., to reveal low IGD).

Apart from that, the disproportion of gender and race was also acknowledged as one of limitations of present study. It was vital to contemplate that the disproportionate number of the participants in terms of gender and race may influence a significant degree of the discussion of the present study. This could be further explained by the differences of behavioural, emotional and information processing that culminate in distinct patterns of decision-making and problem-solving system between males and females (Marraudino et al., 2022). Inescapably, cultural background could also play an essential role in determining one's behaviours, emotions and thoughts which possessed aim to adhere to their cultural norms and regulations. Thus, ensuring the proportionate gender and race could aid in acquiring comprehensible and uncontroversial results.

Markedly, the nature of cross-sectional study was also seen as the limitation of present study. Owing to its nature, present study was ineffectual to determine the definite causal relationship or cause-and-effect among the variables as this was resulting from the collection of data at once. Regarding this, it was impossible for future studies to examine the changes of IGD as well as the need frustration overtime among participants to yield the research databases.

Concurrently, as the limitation, present study only emphasized on MOBA genre and gamers, which tends to result in the generalization issue for future studies that focused on others genre. As a matter of fact, the distinction of genre displayed a various extent of need frustration, gaming motivations as well as IGD’s symptoms. According to Toth et al. (2021), there was evident difference between the MOBA genre and Real-time strategy (RTS) genre, which MOBA gamers focused on relatedness and belonginess, whereas RTS gamers were highly seeking for competence fulfilment.

Recommendations

In accordance with the limitations of present study, there were several recommendations provided for the future studies. Firstly, corresponding to the limitation of self-report questionnaires, future studies were recommended to utilize additional methods such as interviewing to gather the required data objectively instead of subjectively relying on the participants' beliefs and perspective oneself (McGrath et al., 2019). This method of data collection was supported by a few of research which analysed the severity of IGD and the extent of need frustration which imparted a certain extent of detailed information through observation on participants' psychological states and simultaneously, interview could aid in minimising the potential of response bias (Lin et al., 2021a; Lin et al., 2021b). In fact, the existence of the interviewer could play a role in giving terminology explanations for the participants who confronted the understanding concerns during the questionnaire answering.

Furthermore, future studies were suggested to manipulate the evenly proportion of gender as well as race in their studies as in present study, males and Chinese constituted to a large proportion of dataset as compared to others, which could possibly lead to generalization concern for future studies. As a matter of fact, there was a potential influence on the accuracy in assessing the mediating effect of gaming motivations between the need frustration and IGD's symptom owing to the disproportionate gender and race. This could be explained by distinct behavioural, psychological and emotional states that possessed by different genders along with racial to cope with need frustration, which tend to be influenced by the cultural background, environmental and social factors (Gelunas, 2023; Lopez-Fernandez et al., 2019).

In addition, cross-sectional study emphasized on one-time collection and restrained in examining causal relationship among the variables, thus, future studies could aim to further furnish the databases by conducting longitudinal study. Longitudinal study could be helpful

in giving prominence to periodic data collection and this research design was appropriate for assessing the behavioural and psychological changes across lifetime. For instance, it could be applicable to assess the changes of the severity degree of IGD as well as the extent of need frustration over lifetime that resulted by problematic gaming practices (Teng et al., 2020; Yang et al., 2022).

Last but not least, future studies were recommended to focuse on a wide range of gaming genres which able to ensure the generalization of future studies. Indeed, the focusing on distinct genres also able to make certain on the accuracy of the predictive and mediating effects of need frustration and gaming motivations respectively toward IGD's symptoms. As mentioned in limitation, there was a difference degree of influences of gaming genre toward need frustration compensation which afterward triggered on the distinct types of gaming motivations.

Conclusion

In conclusion, need frustration, extrinsic motivation and amotivation were found as significant predictors of association between need frustration and IGD among MOBA Malaysian youth, but not intrinsic motivation. At the same time, extrinsic motivation and amotivation were found to mediating the association between need frustration and IGD. The present study has filled a gap in the literature by acknowledging the relationship between need frustration, gaming motivations and IGD among MOBA Malaysian youth. Giving that the rising population in Malaysia that involved in Internet gaming, this current study was useful in discovering effective and efficient paths to attribute the cause, early preventions and interventions, and treatments of IGD in Malaysia.

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Appendix A

Informed Consent

PERSONAL DATA PROTECTION NOTICE

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 Associated 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 complaints 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_____.

Acknowledgment of Notice

[ ] I have been notified and that I hereby understood, consented and agreed per UTAR above notice.

[ ] I disagree, my personal data will not be processed.

.....
Name:
Date:

Questionnaire

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

IGD Instructions:

These questions will ask you about your gaming activity during the past year (i.e., last 12 months). By gaming activity, we understand any gaming-related activity that has been played either from a computer/laptop or from a gaming console or any other kind of device (e.g., mobile phone, tablet, etc.) both online and/or offline.

1 Never 2 Rarely 3 Sometimes 4 Often 5 Very often

	1 Never (1)	2 Rarely (2)	3 Sometimes (3)	4 Often (4)	5 Very Often (5)
Do you feel preoccupied with your gaming behavior? (Some examples: Do you think about previous gaming activity or anticipate the next gaming session? Do you think gaming has become the dominant activity in your daily life?).	○	○	○	○	○
Do you feel more irritability, anxiety or even sadness when you try to either reduce or stop your gaming activity?	○	○	○	○	○
Do you feel the need to spend increasing amount of time engaged gaming in order to achieve satisfaction or pleasure?	○	○	○	○	○
Do you systematically fail when trying to control or cease your gaming activity?	○	○	○	○	○
Have you lost interests in previous hobbies and other entertainment activities as a result of your engagement with the game?	○	○	○	○	○
Have you continued your gaming activity despite knowing it was causing problems between you and other people?	○	○	○	○	○
Have you deceived any of your family members, therapists or others because the amount of your gaming activity?	○	○	○	○	○
Do you play in order to temporarily escape or relieve a negative mood (e.g., helplessness, guilt, anxiety)?	○	○	○	○	○
Have you jeopardized or lost an important relationship, job or an educational or career opportunity because of your gaming activity?	○	○	○	○	○

Basic Psychological Need Satisfaction and Frustration (BPNSF)

BPNSF Instruction:

Below we ask you about the kind of experiences you actually have in your life. Please read each of the following items carefully. You can choose from 1 to 5 to indicate the degree to which the statement is true for you at this point in your life.

1 Completely Disagree 2 Disagree 3 Neutral 4 Agree 5 Completely Agree

Autonomy Satisfaction

	1 Completely Disagree (1)	2 Disagree (2)	3 Neutral (3)	4 Agree (4)	5 Completely Agree (5)
I feel a sense of choice and freedom in the things I undertake.	○	○	○	○	○
I feel that my decisions reflect what I really want.	○	○	○	○	○
I feel my choices express who I really am.	○	○	○	○	○
I feel I have been doing what really interests me.	○	○	○	○	○

RS Relatedness Satisfaction

	1 Completely Disagree (1)	2 Disagree (2)	3 Neutral (3)	4 Agree (4)	5 Completely Agree (5)
I feel that the people I care about also care about me.	○	○	○	○	○
I feel connected with people who care for me, and for whom I care.	○	○	○	○	○
I feel close and connected with other people who are important to me.	○	○	○	○	○
I experience a warm feeling with the people I spend time with.	○	○	○	○	○

CS Competence Satisfaction

	1 Completely Disagree (1)	2 Disagree (2)	3 Neutral (3)	4 Agree (4)	5 Completely Agree (5)
I feel confident that I can do things well.	○	○	○	○	○
I feel capable at what I do.	○	○	○	○	○
I feel competent to achieve my goals.	○	○	○	○	○
I feel I can successfully complete difficult tasks.	○	○	○	○	○

AF Autonomy Frustration

	1 Completely Disagree (1)	2 Disagree (2)	3 Neutral (3)	4 Agree (4)	5 Completely Agree (5)
Most of the things I do feel like “I have to”.	○	○	○	○	○
I feel forced to do many things I wouldn’t choose to do.	○	○	○	○	○
I feel pressured to do too many things.	○	○	○	○	○
My daily activities feel like a chain of obligations.	○	○	○	○	○

RF Relatedness Frustration

	1 Completely Disagree (1)	2 Disagree (2)	3 Neutral (3)	4 Agree (4)	5 Completely Agree (5)
I feel excluded from the group I want to belong to.	○	○	○	○	○
I feel that people who are important to me are cold and distant towards me.	○	○	○	○	○
I have the impression that people I spend time with dislike me.	○	○	○	○	○
I feel the relationships I have are just superficial.	○	○	○	○	○

CF Competence Frustration

	1 Completely Disagree (1)	2 Disagree (2)	3 Neutral (3)	4 Agree (4)	5 Completely Agree (5)
I have serious doubts about whether I can do things well.	○	○	○	○	○
I feel disappointed with many of my performances.	○	○	○	○	○
I feel insecure about my abilities.	○	○	○	○	○
I feel like a failure because of the mistakes I make.	○	○	○	○	○

Gaming Motivation Scale (GAMS)

GAMS Instruction:

These questions will ask you about the type of gaming motivation that you have in your gaming behavior. Please read each of the following items carefully. You can choose from 1 to 7 to indicate the degree to which the statement that you agree at this point in your daily life.

1 Do not agree at all 2 Strongly not agree 3 Do not agree 4 Neutral 5 Agree 6 Strongly agree 7 Very strongly agree

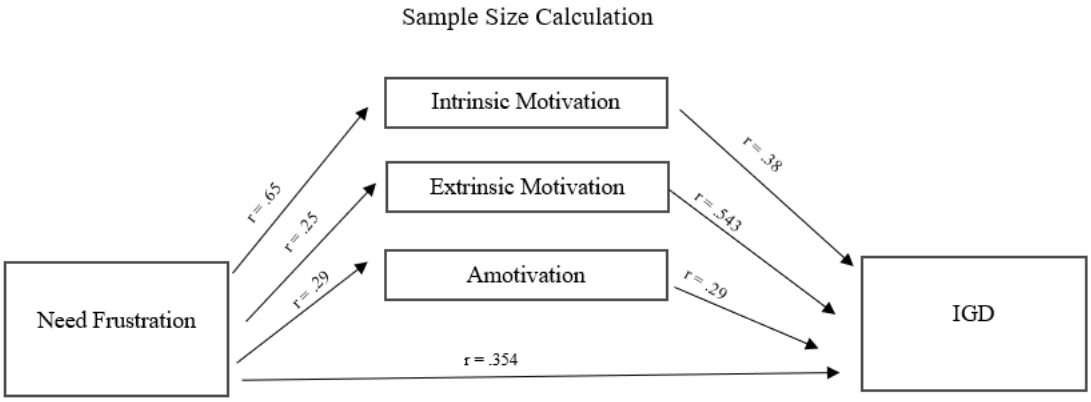
	1 Do not agree at all (1)	2 Strongly not agree (2)	3 Do not agree (3)	4 Neutral (4)	5 Agree (5)	6 Strongly agree (6)	7 Very strongly agree (7)
Because it is stimulating to play.	○	○	○	○	○	○	○
For the pleasure of trying/experiencing new game options (e.g., classes, characters, teams, races, equipment).	○	○	○	○	○	○	○
For the feeling of efficacy I experience when I play.	○	○	○	○	○	○	○
Because it is an extension of me.	○	○	○	○	○	○	○
Because it is an integral part of my life.	○	○	○	○	○	○	○
Because it is aligned with my personal values.	○	○	○	○	○	○	○
Because it is a good way to develop important aspects of myself.	○	○	○	○	○	○	○
Because it is a good way to develop social and intellectual abilities that are useful to me.	○	○	○	○	○	○	○

Because it has personal significance to me.	○	○	○	○	○	○	○
Because I feel that I must play regularly.	○	○	○	○	○	○	○
Because I must play to feel good about myself.	○	○	○	○	○	○	○
Because otherwise I would feel bad about myself.	○	○	○	○	○	○	○
To acquire powerful and rare items (e.g., armors, weapons) and virtual currency (e.g., gold pieces, gems) or to unlock hidden/restricted elements of the game (e.g., new characters, equipment, maps).	○	○	○	○	○	○	○
For the prestige of being a good player.	○	○	○	○	○	○	○
To gain in-game awards and trophies or character/avatar's levels and experiences points.	○	○	○	○	○	○	○

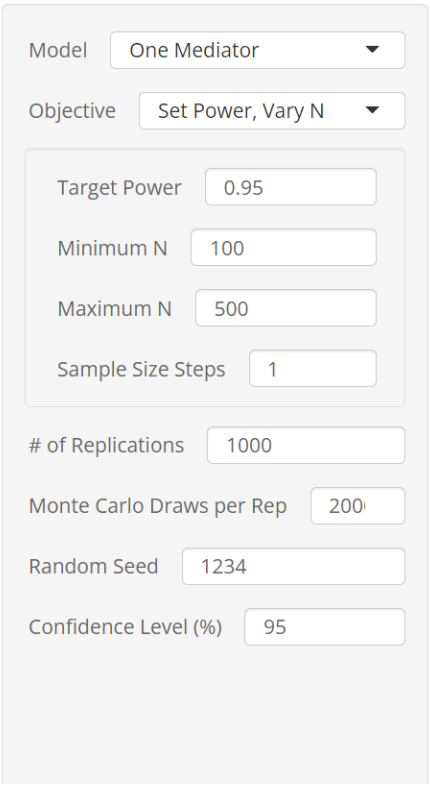
It is not clear anymore; I sometimes ask myself if it is good for me.	○	○	○	○	○	○	○
I used to have good reasons, but now I am asking myself if I should continue.	○	○	○	○	○	○	○
Honestly, I don't know; I have the impression that I'm wasting my time.	○	○	○	○	○	○	○

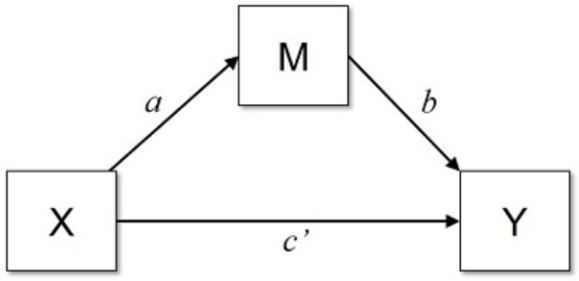
Appendix B

Sample Size Calculation



Path 1: NFàIntrinsic Motivationà IGD



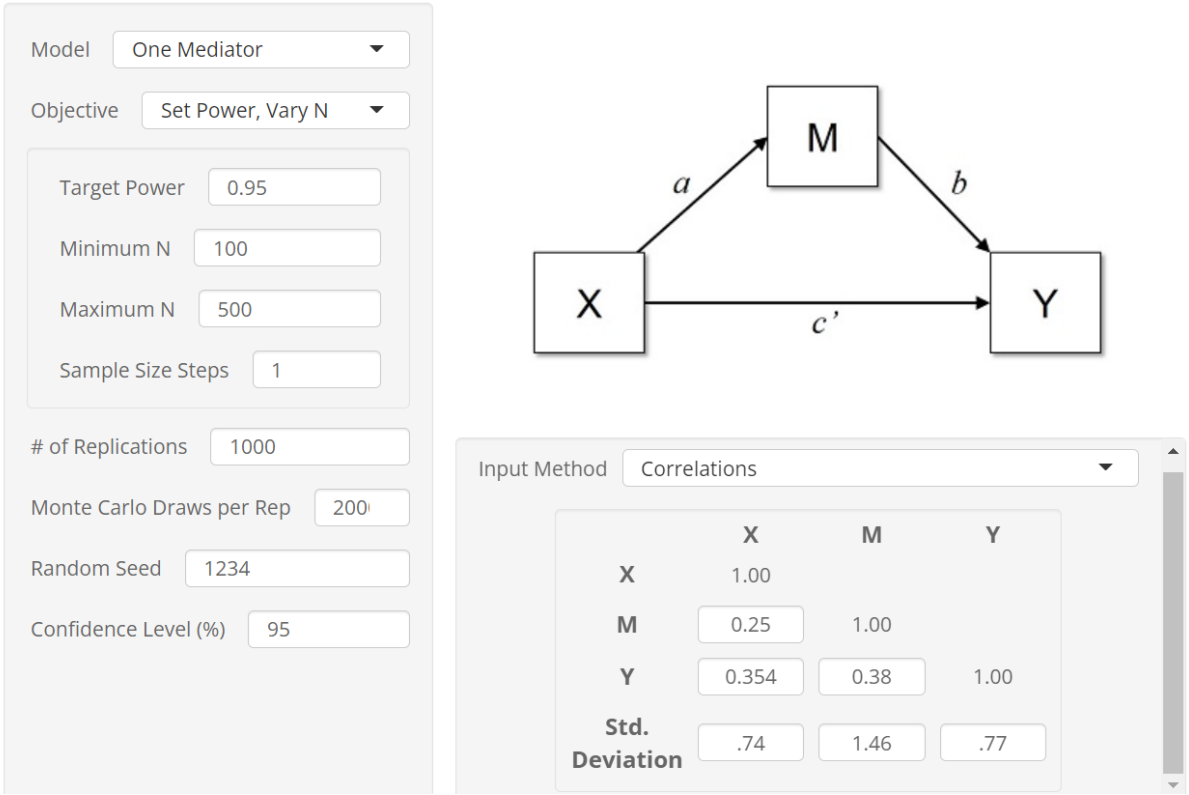


Parameter	N	LL	Power	UL
ab	100.00	0.49	0.59	0.69
ab	101.00	0.50	0.60	0.69
ab	102.00	0.50	0.60	0.69
ab	103.00	0.50	0.60	0.69

ab	277.00	0.93	0.95	0.97
ab	278.00	0.93	0.95	0.97
ab	279.00	0.93	0.95	0.97
ab	280.00	0.93	0.95	0.97
ab	281.00	0.93	0.95	0.97

N = 281 at 0.95 power

Path 2: NFàExtrinsic MotivationàIGD

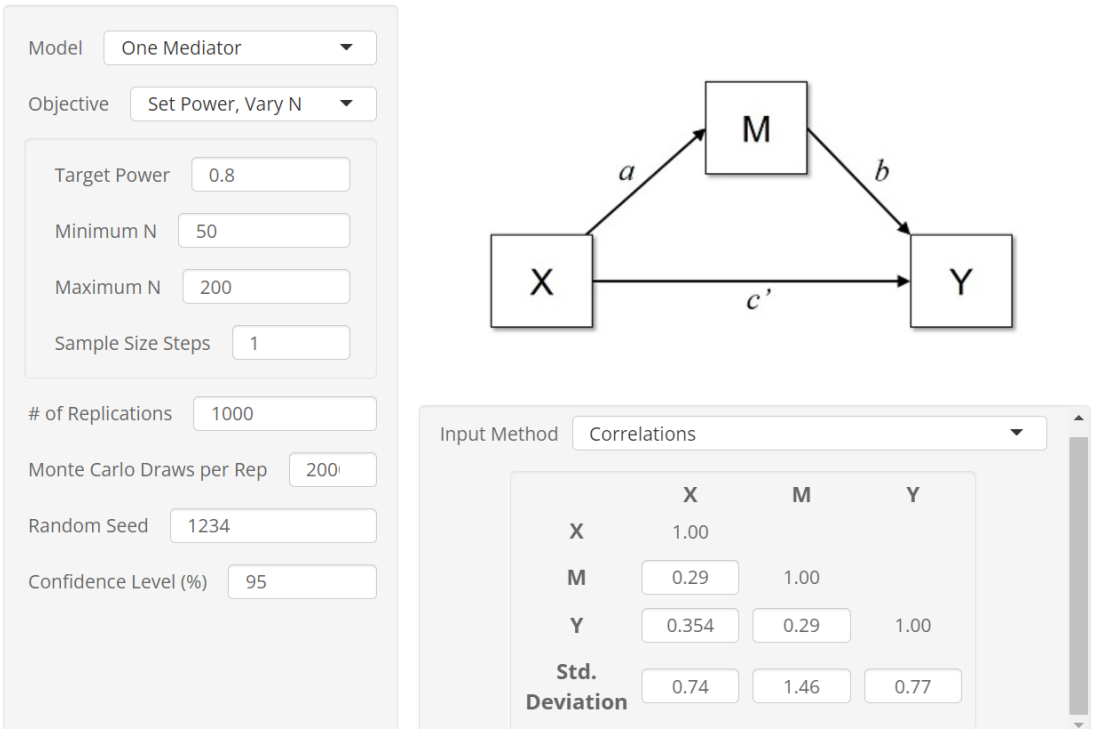


Parameter	N	LL	Power	UL
ab	100.00	0.52	0.65	0.76
ab	101.00	0.53	0.65	0.76
ab	102.00	0.53	0.66	0.76
ab	103.00	0.54	0.66	0.77

ab	199.00	0.92	0.95	0.97
ab	200.00	0.92	0.95	0.97
ab	201.00	0.92	0.95	0.97
ab	202.00	0.92	0.95	0.97
ab	203.00	0.93	0.95	0.97

N = 203 at 0.95 power

Path 3: NFàAmotivationàIGD



Parameter	N	LL	Power	UL
ab	100.00	0.52	0.68	0.80
ab	101.00	0.53	0.68	0.81
ab	102.00	0.54	0.69	0.81
ab	103.00	0.55	0.70	0.81

ab	163.00	0.91	0.95	0.97
ab	164.00	0.91	0.95	0.97
ab	165.00	0.91	0.95	0.97
ab	166.00	0.92	0.95	0.97
ab	167.00	0.92	0.95	0.98

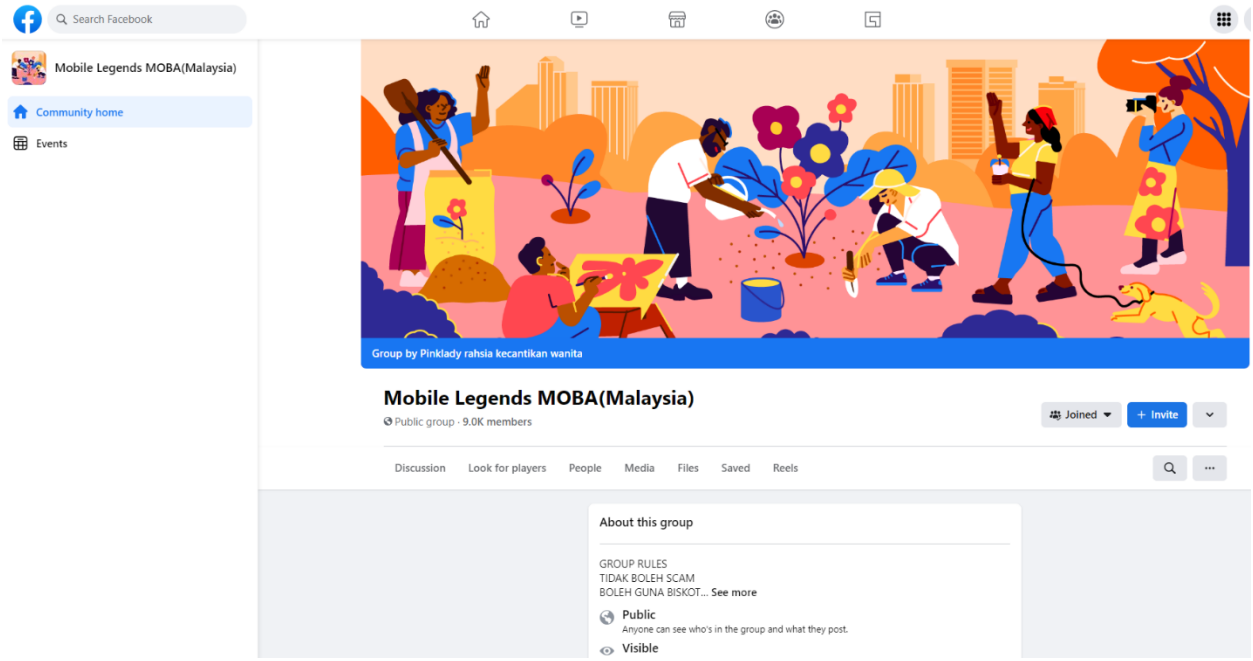
N =167 at 0.95 power

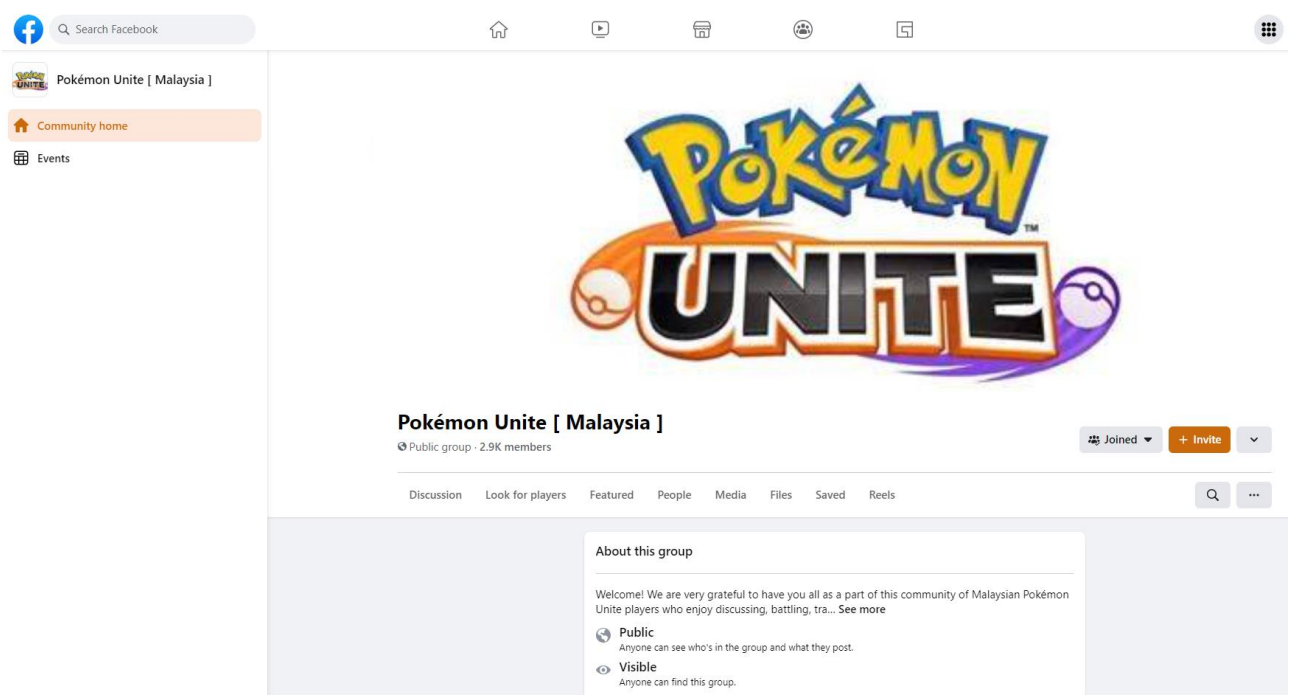
Average of three paths: N = (281 + 203 +167)/3

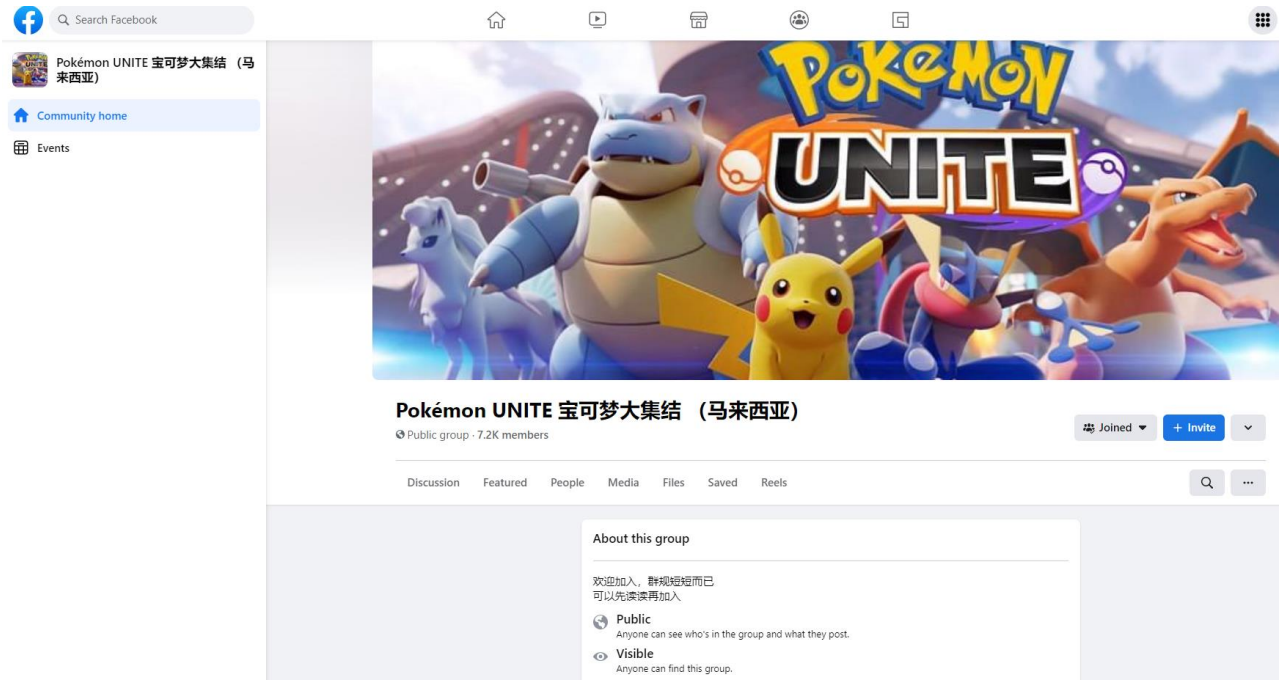
= 217

Appendix C

Facebook MOBA Groups






Search Facebook
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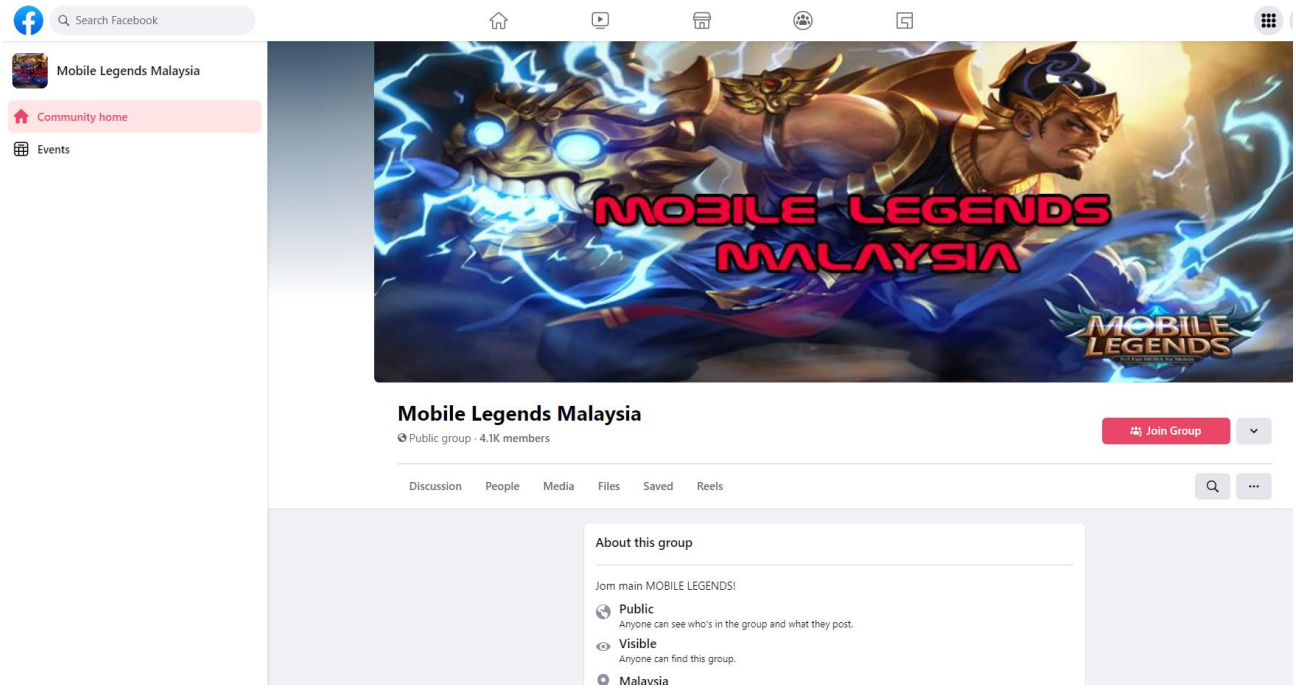
Community home
Events
POKEMON UNITE
Pokémon UNITE 宝可梦大集结 （马来西亚）
Public group · 7.2K members
Joined
+ Invite
Discussion
Featured
People
Media
Files
Saved
Reels
About this group
欢迎加入，群规短短而已
可以先读读再加入
Public
Anyone can see who's in the group and what they post.
Visible
Anyone can find this group.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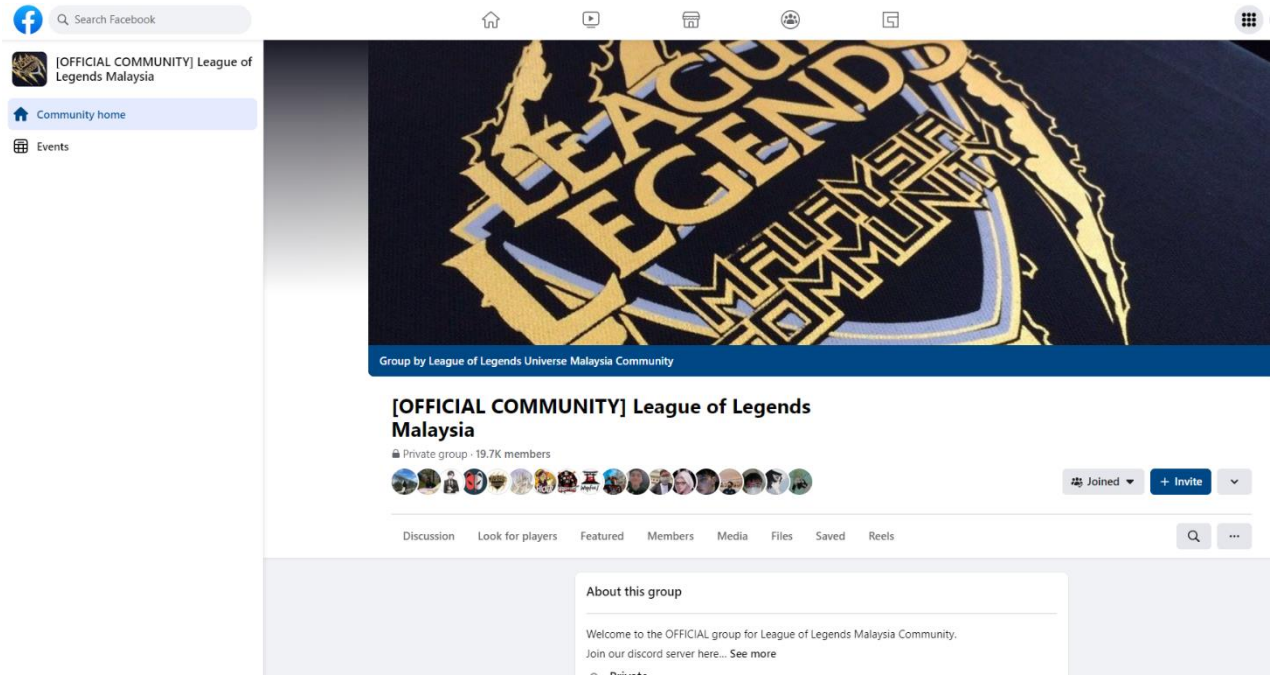
Malaysia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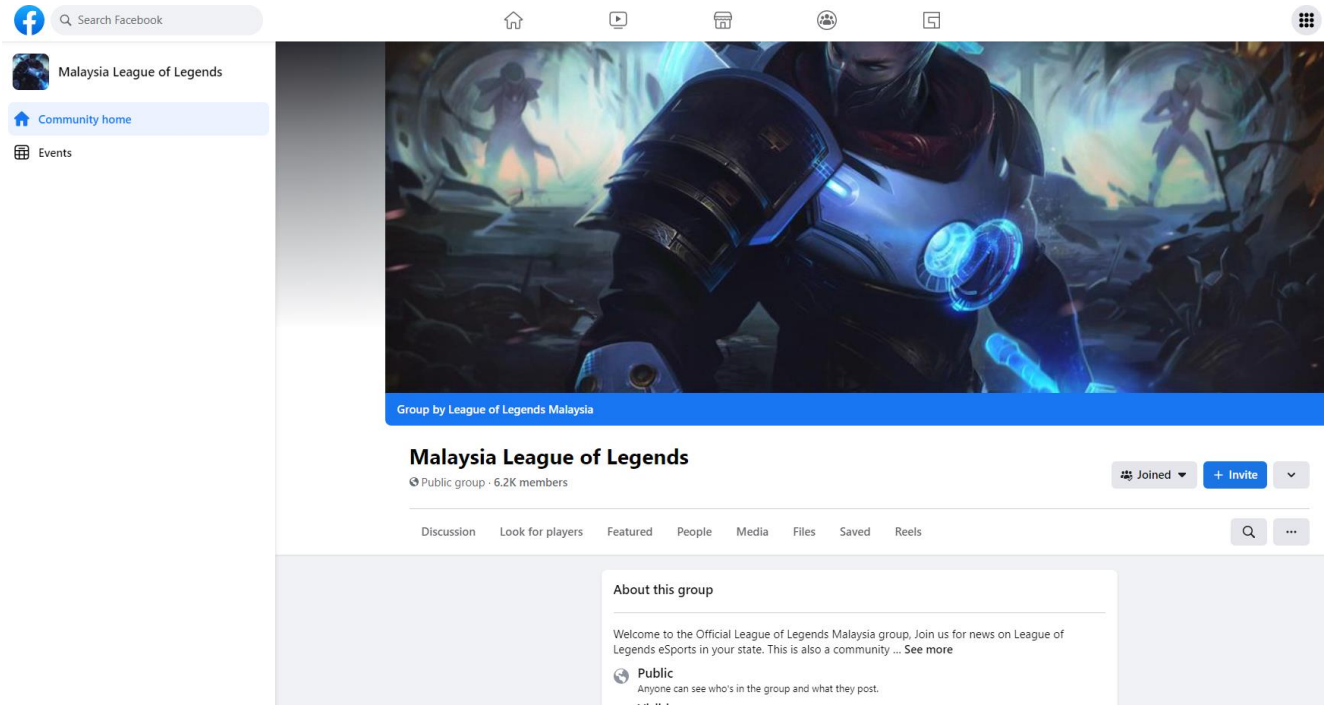
Join our discord server here... See more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Group by League of Legends Malaysia
Malaysia League of Legends
Public group · 6.2K members
Joined
+ Invite
Discussion
Look for players
Featured
People
Media
Files
Saved
Reels
About this group
Welcome to the Official League of Legends Malaysia group, Join us for news on League of Legends eSports in your state. This is also a community ... See more
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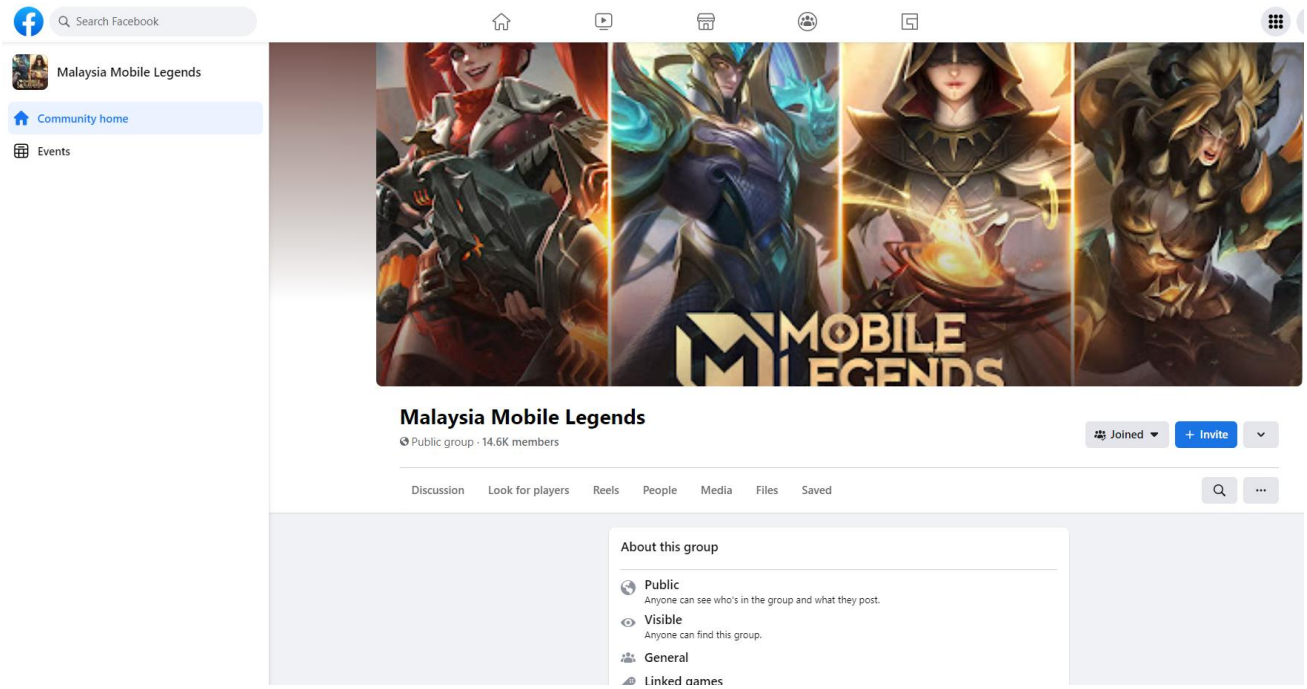
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Community home
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Malaysia Mobile Legends
Public group · 14.6K members
Joined
+ Invite
Discussion
Look for players
Reels
People
Media
Files
Saved
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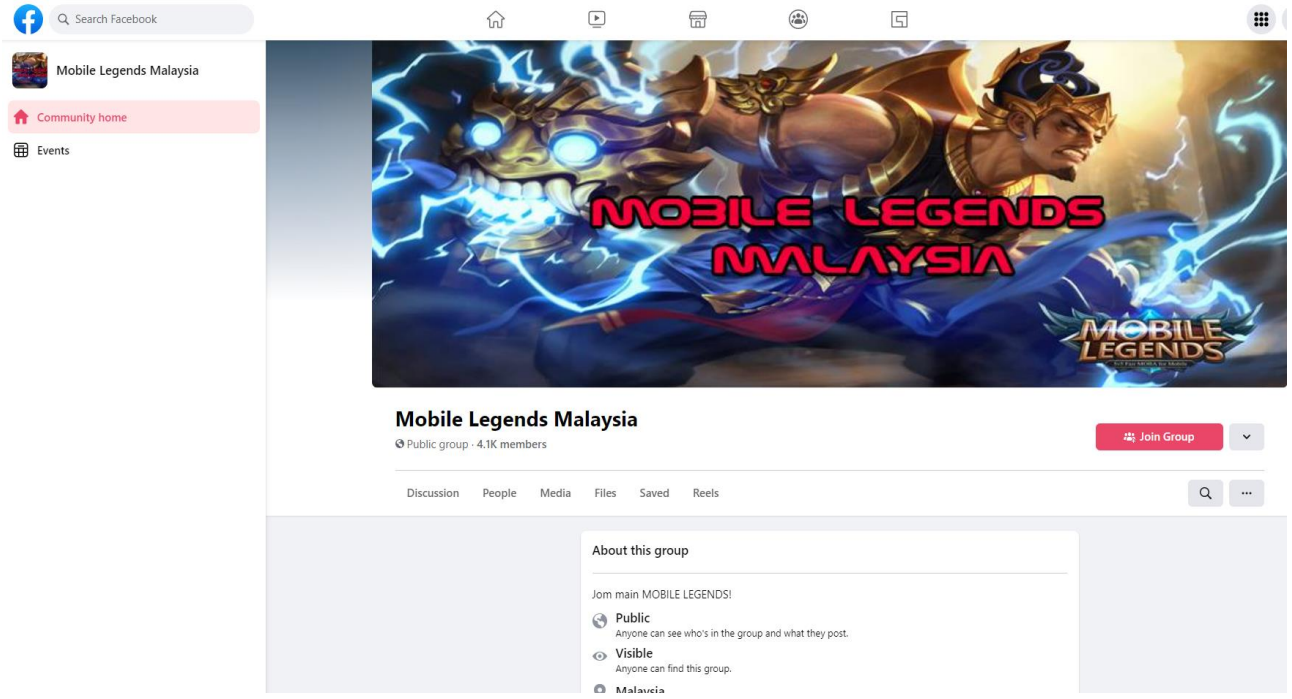
Visible
Anyone can find this group.
General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MALAYSIA
MOBILE LEGENDS
Mobile Legends Malaysia
Public group · 4.1K members
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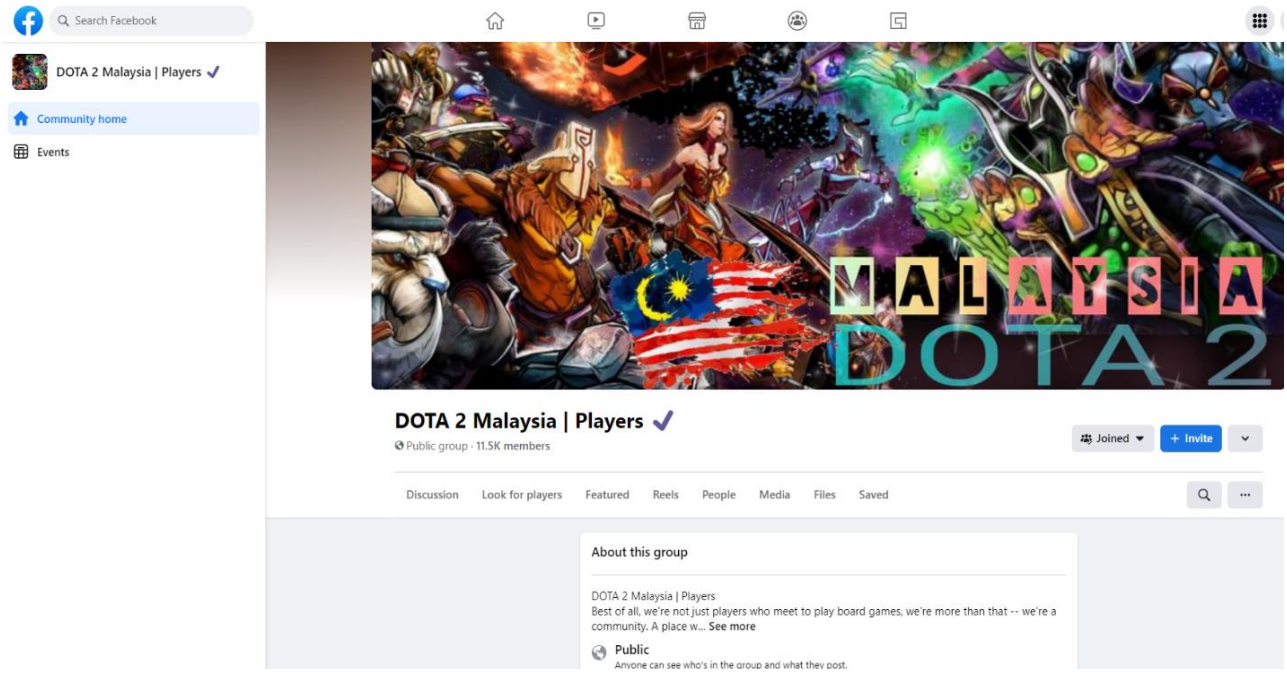
People
Media
Files
Saved
Reels
About this group
Jom main MOBILE LEGENDS!
Public
Anyone can see who's in the group and what they post.
Visible
Anyone can find this group.


Search Facebook
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Community home
Events
MALAYSIA
DOTA 2
DOTA 2 Malaysia | Players
Public group · 11.5K members
Joined
+ Invite
Discussion
Look for players
Featured
Reels
People
Media
Files
Saved
About this group
DOTA 2 Malaysia | Players
Best of all, we're not just players who meet to play board games, we're more than that -- we're a community. A place w... See more
Public
Anyone can see who's in the group and what they post.

Appendix D

Reliability Analysis

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

Reliability Statistics

Cronbach's Alpha	N of Items
.794	9

Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS)

Autonomy Frustration Subscale

Reliability Statistics

Cronbach's Alpha	N of Items
.775	4

Relatedness Frustration Subscale

Reliability Statistics

Cronbach's Alpha	N of Items
.878	4

Competence Frustration Subscale

Reliability Statistics

Cronbach's Alpha	N of Items
.897	4

Gaming Motivation Scale (GAMS)

Intrinsic Motivation Subscale

Reliability Statistics

Cronbach's Alpha	N of Items
.794	3

Integrated Regulation Subscale

Reliability Statistics

Cronbach's Alpha	N of Items
.834	3

Identified Regulation Subscale

Reliability Statistics

Cronbach's Alpha	N of Items
.798	3

Introjected Regulation Subscale

Reliability Statistics

Cronbach's Alpha	N of Items
.874	3

External Regulation Subscale

Reliability Statistics

Cronbach's Alpha	N of Items
.672	3

Amotivation Subscale

Reliability Statistics

Cronbach's Alpha	N of Items
.856	3

Appendix E

Normality Assumptions Checking

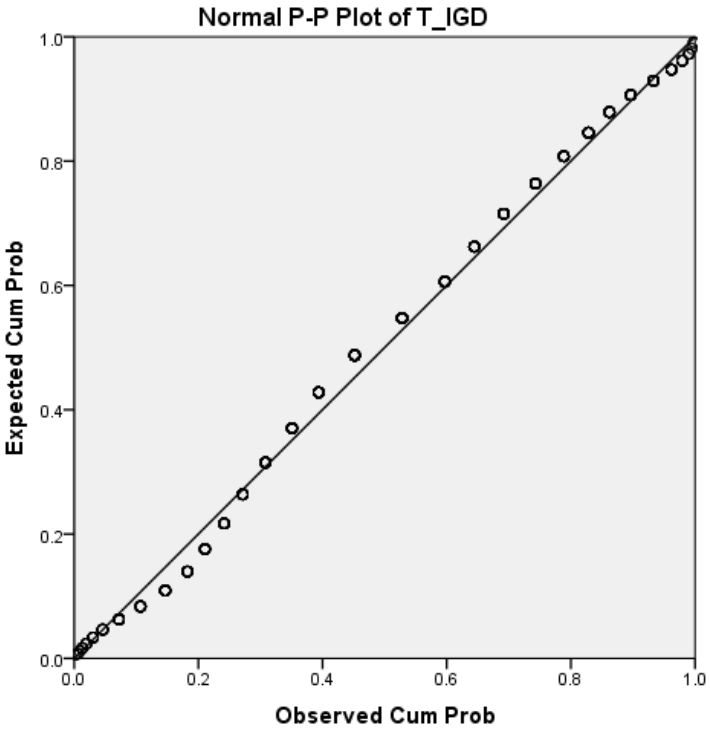
Kolmogorov-Smirnov (K-S) test

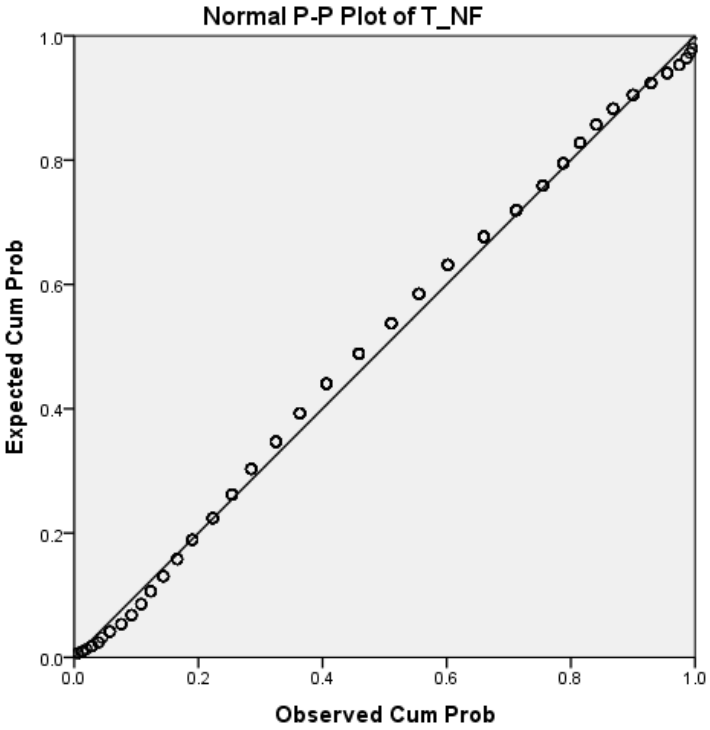
Tests of Normality

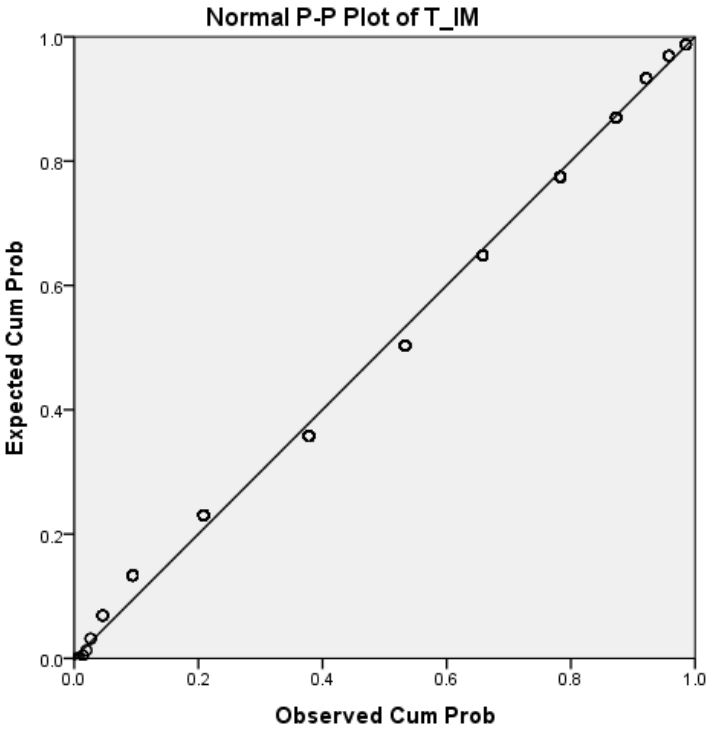
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
T_IGD	.071	516	.000	.985	516	.000
T_NF	.058	516	.000	.985	516	.000
T_IM	.109	516	.000	.962	516	.000
T_EM	.064	516	.000	.983	516	.000
T_AM	.107	516	.000	.962	516	.000

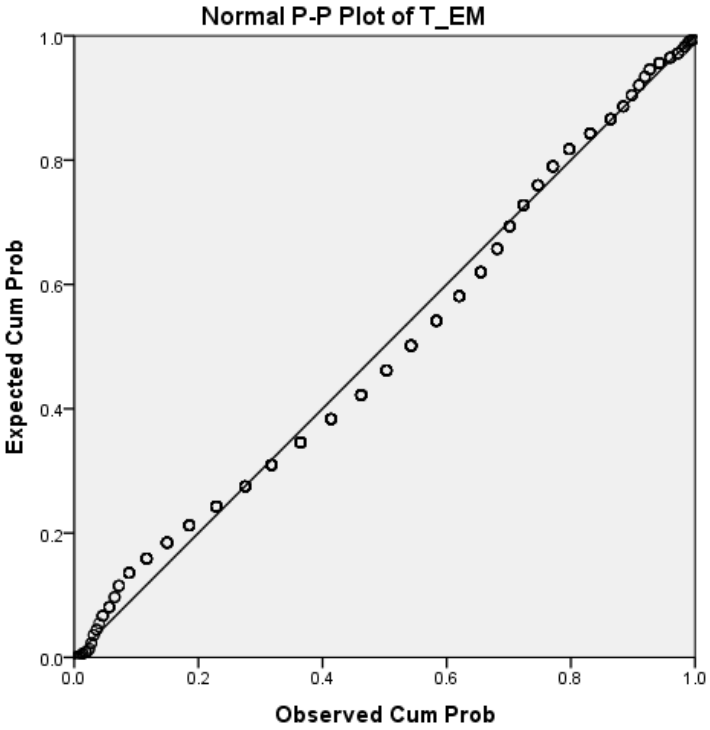
a. Lilliefors Significance Correction

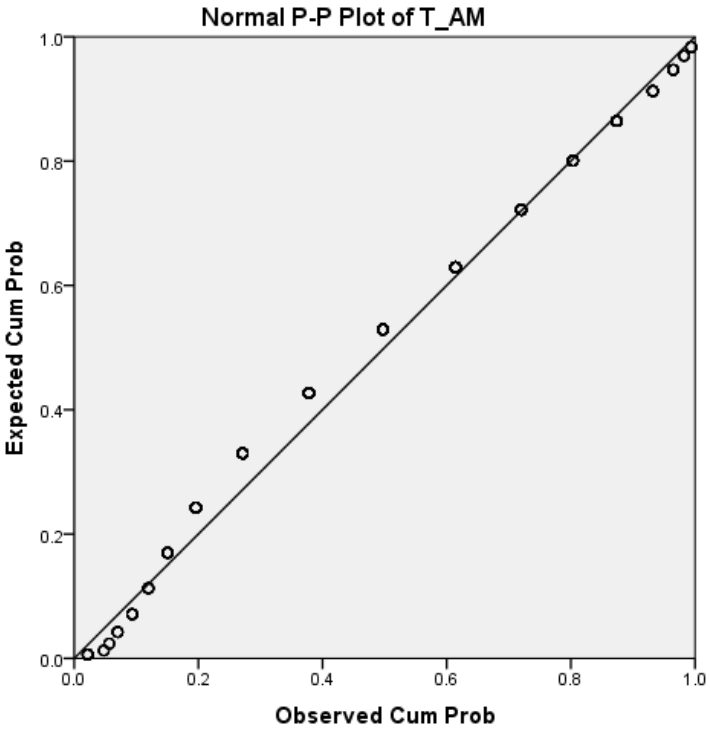
Probability-probability (P-P) plot



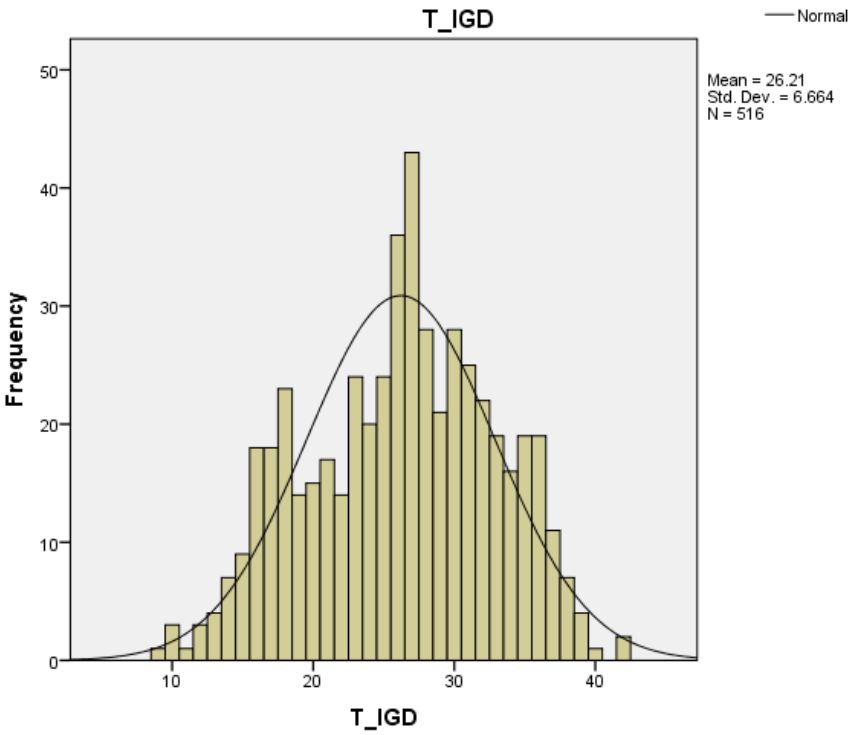

Normal P-P Plot of T_NF
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

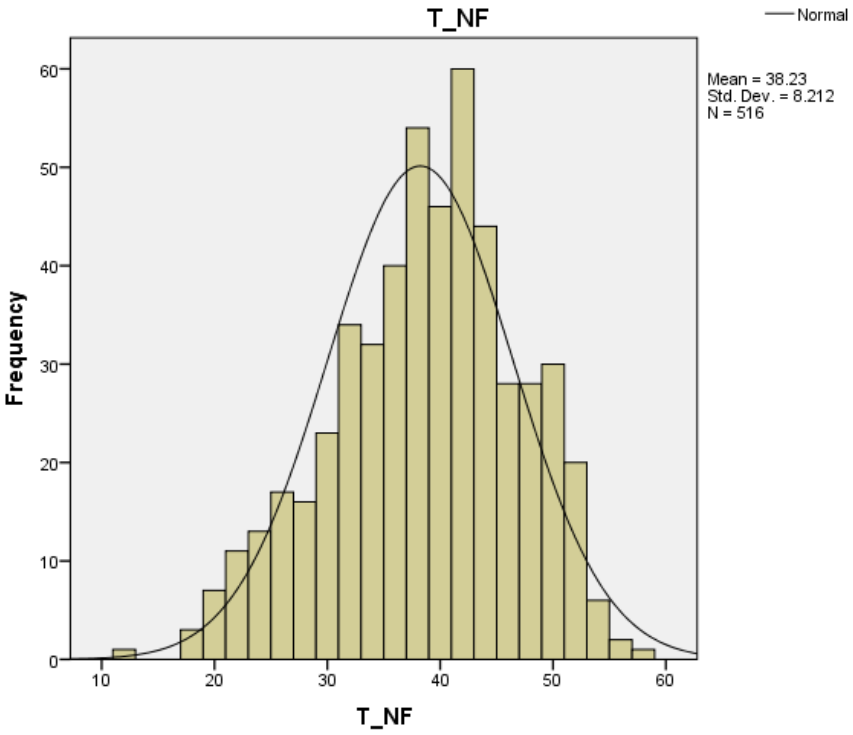

Normal P-P Plot of T_IM
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

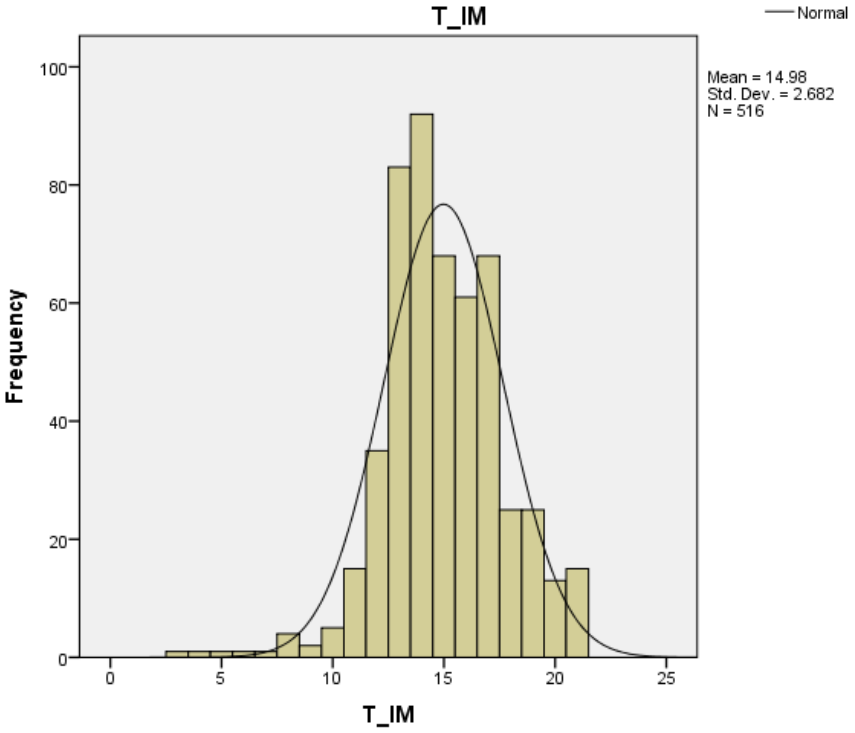

Normal P-P Plot of T_EM
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

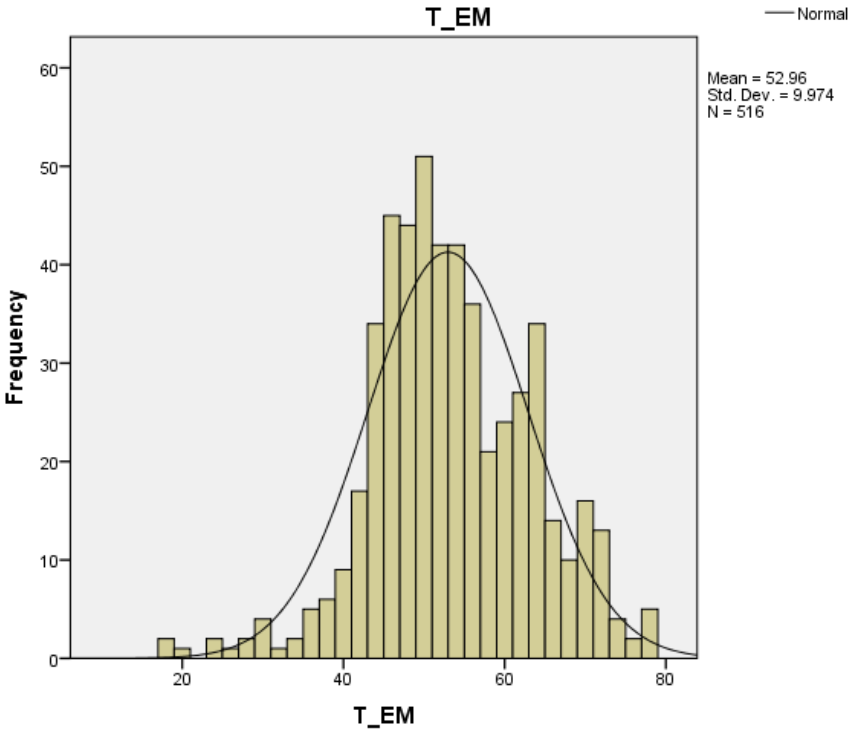

Normal P-P Plot of T_AM
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

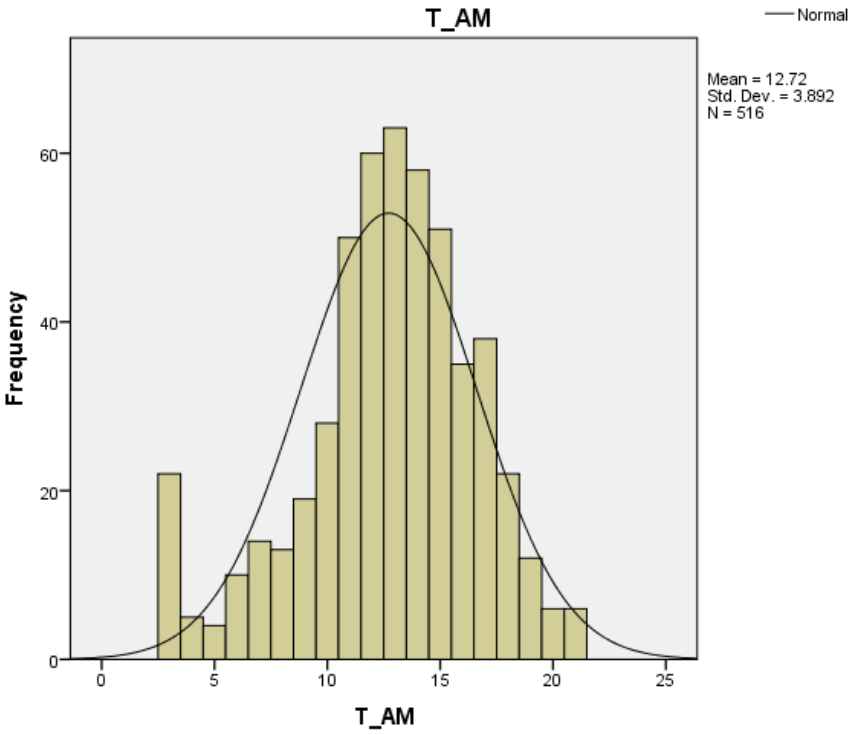
Histogram


T_IGD
Normal
Mean = 26.21
Std. Dev. = 6.664
N = 516
Frequency
T_IGD


T_NF
Normal
Mean = 38.23
Std. Dev. = 8.212
N = 516
Frequency
T_NF


T_IM
Normal
Mean = 14.98
Std. Dev. = 2.682
N = 516
Frequency
T_IM


T_EM
Normal
Mean = 52.96
Std. Dev. = 9.974
N = 516
Frequency
T_EM


T_AM
Normal
Mean = 12.72
Std. Dev. = 3.892
N = 516
Frequency
60
40
20
0
0
5
10
15
20
25
T_AM

Appendix F: Multiple Linear Regression Analysis

Durbin-Watson

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.703[a]	.494	.490	4.759	1.808

a. Predictors: (Constant), T_AM, T_IM, T_NF, T_EM

b. Dependent Variable: T_IGD

Variance Inflation Factor (VIF) Values and Tolerance Values

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-.726	1.568		-.463	.644		
	T_NF	.380	.031	.469	12.448	.000	.699	1.431
	T_IM	.015	.088	.006	.173	.863	.790	1.266
	T_EM	.153	.025	.229	6.076	.000	.694	1.440
	T_AM	.319	.064	.186	4.958	.000	.703	1.422

a. Dependent Variable: T_IGD

Multivariate Outliers Assumptions Checking

Case Summaries[a]

			Case Number	Mahalanobis Distance	Cook's Distance	Centered Leverage Value
Group_IC	0	1	2	3.05182	.00345	.00593
		2	3	3.05182	.00345	.00593
		3	4	6.58083	.00002	.01278
		4	5	1.81031	.00131	.00352
		5	7	6.71009	.00042	.01303
		6	8	3.48117	.00006	.00676
		7	9	3.75127	.00372	.00728
		8	10	1.77239	.00043	.00344
		9	11	1.77239	.00043	.00344
		10	12	5.49921	.00080	.01068
		11	13	3.07479	.00000	.00597

	12	15	9.34107	.00126	.01814
	13	16	10.59020	.01614	.02056
	14	17	4.70916	.00575	.00914
	15	18	.92651	.00002	.00180
	16	19	3.48868	.00139	.00677
	17	20	4.61253	.00001	.00896
	18	21	3.89095	.00442	.00756
	19	22	3.89095	.00442	.00756
	20	23	2.28297	.00129	.00443
	21	24	3.08418	.00178	.00599
	22	25	4.94740	.00025	.00961
	23	26	2.89622	.00077	.00562
	24	27	3.38798	.00200	.00658
	25	28	3.38798	.00200	.00658
	26	29	5.75473	.00027	.01117
	27	30	4.13414	.00010	.00803
	28	31	3.69524	.00002	.00718
	29	32	1.40598	.00173	.00273
	30	33	4.41405	.00025	.00857
	31	34	5.66424	.00242	.01100
	32	35	3.38481	.00305	.00657
	33	36	4.96208	.00069	.00964
	34	37	3.38885	.00004	.00658
	35	38	3.38885	.00004	.00658
	36	39	10.11759	.00396	.01965
	37	40	8.54287	.00011	.01659
	38	41	9.02300	.00264	.01752
	39	42	4.08672	.00101	.00794
	40	43	9.95619	.00313	.01933
	41	45	3.56366	.00409	.00692
	42	47	1.01757	.00112	.00198
	43	48	11.61354	.00176	.02255
	44	49	6.40426	.00784	.01244
	45	50	1.39812	.00248	.00271
	46	51	5.65179	.00588	.01097
	47	52	5.65179	.00588	.01097
	48	53	.76605	.00102	.00149
	49	54	1.54709	.00199	.00300
	50	55	.55391	.00018	.00108
	51	56	2.73543	.00182	.00531

	52	58	1.46236	.00000	.00284
	53	59	2.33835	.00003	.00454
	54	60	2.59343	.00011	.00504
	55	61	.37603	.00024	.00073
	56	62	.87443	.00012	.00170
	57	63	1.31624	.00014	.00256
	58	64	4.70755	.00044	.00914
	59	65	1.32486	.00180	.00257
	60	66	.16804	.00000	.00033
	61	67	.97210	.00005	.00189
	62	68	1.56428	.00023	.00304
	63	69	6.48838	.00000	.01260
	64	70	1.59503	.00053	.00310
	65	71	3.80921	.00011	.00740
	66	72	2.82080	.00285	.00548
	67	73	2.14498	.00015	.00417
	68	74	13.57752	.00574	.02636
	69	75	.80406	.00008	.00156
	70	76	.83680	.00004	.00162
	71	77	.88199	.00050	.00171
	72	78	.69189	.00019	.00134
	73	79	1.45931	.00027	.00283
	74	80	.63757	.00046	.00124
	75	81	1.97406	.00114	.00383
	76	82	1.05732	.00062	.00205
	77	83	.61073	.00044	.00119
	78	84	1.69413	.00000	.00329
	79	85	.41931	.00000	.00081
	80	86	1.47954	.00030	.00287
	81	87	1.41127	.00015	.00274
	82	88	.94207	.00004	.00183
	83	89	.91819	.00038	.00178
	84	90	1.52623	.00074	.00296
	85	91	.25079	.00013	.00049
	86	92	1.02792	.00012	.00200
	87	93	.94947	.00001	.00184
	88	94	.63736	.00000	.00124
	89	95	1.54806	.00075	.00301
	90	96	2.32778	.00048	.00452
	91	97	.17237	.00005	.00033

	92	98	.64727	.00003	.00126
	93	99	.99973	.00015	.00194
	94	100	.55893	.00016	.00109
	95	101	1.82691	.00001	.00355
	96	102	1.03060	.00004	.00200
	97	103	.52094	.00000	.00101
	98	104	1.21667	.00008	.00236
	99	105	3.22558	.00027	.00626
	100	106	1.98715	.00146	.00386
	101	107	6.78563	.00098	.01318
	102	108	1.78918	.00012	.00347
	103	109	1.82781	.00174	.00355
	104	110	.63884	.00009	.00124
	105	111	1.28979	.00011	.00250
	106	112	.77797	.00009	.00151
	107	113	.87346	.00008	.00170
	108	114	.30822	.00000	.00060
	109	115	1.05135	.00002	.00204
	110	116	.44324	.00009	.00086
	111	117	1.13106	.00012	.00220
	112	118	10.70791	.00248	.02079
	113	119	1.46449	.00053	.00284
	114	120	2.21157	.00004	.00429
	115	121	2.71005	.00002	.00526
	116	122	4.64354	.00336	.00902
	117	123	3.90930	.00073	.00759
	118	124	1.76186	.00225	.00342
	119	125	1.17366	.00171	.00228
	120	126	3.88283	.00050	.00754
	121	127	3.38180	.00112	.00657
	122	128	2.67904	.00071	.00520
	123	129	2.74690	.00047	.00533
	124	130	1.53625	.00003	.00298
	125	131	1.53625	.00003	.00298
	126	132	4.97684	.00014	.00966
	127	133	.95433	.00001	.00185
	128	134	.79956	.00021	.00155
	129	135	.89662	.00012	.00174
	130	136	1.57824	.00008	.00306
	131	137	.56159	.00001	.00109

	132	138	1.17296	.00016	.00228
	133	139	.43806	.00000	.00085
	134	140	1.43134	.00000	.00278
	135	141	1.02929	.00039	.00200
	136	142	1.41889	.00046	.00276
	137	143	.73137	.00001	.00142
	138	144	1.49373	.00008	.00290
	139	145	1.04343	.00000	.00203
	140	146	.70284	.00033	.00136
	141	147	1.14080	.00000	.00222
	142	148	.48988	.00000	.00095
	143	149	.87320	.00001	.00170
	144	150	3.78395	.00053	.00735
	145	151	1.31107	.00003	.00255
	146	152	2.55502	.00375	.00496
	147	153	1.76778	.00179	.00343
	148	154	1.60334	.00018	.00311
	149	155	1.80418	.00125	.00350
	150	156	1.80418	.00125	.00350
	151	157	1.40934	.00094	.00274
	152	158	6.12269	.00002	.01189
	153	159	6.12269	.00002	.01189
	154	160	1.23544	.00000	.00240
	155	161	1.66818	.00010	.00324
	156	162	1.55403	.00388	.00302
	157	163	3.28545	.00030	.00638
	158	164	10.91400	.00025	.02119
	159	166	2.53823	.00079	.00493
	160	167	2.42467	.00058	.00471
	161	168	8.43472	.00008	.01638
	162	169	.94737	.00108	.00184
	163	170	5.79507	.00100	.01125
	164	171	4.48230	.00007	.00870
	165	172	2.54405	.00177	.00494
	166	173	3.67320	.00312	.00713
	167	174	4.58592	.00231	.00890
	168	175	3.06481	.00007	.00595
	169	176	3.06481	.00007	.00595
	170	177	5.00547	.00482	.00972
	171	178	5.30585	.00026	.01030

	172	179	3.78943	.00026	.00736
	173	180	4.54222	.00291	.00882
	174	181	5.17802	.00047	.01005
	175	182	4.50174	.00000	.00874
	176	183	3.55536	.00315	.00690
	177	184	3.16638	.00498	.00615
	178	186	4.10839	.00132	.00798
	179	187	1.75218	.00302	.00340
	180	188	3.86043	.00152	.00750
	181	189	5.47176	.00331	.01062
	182	190	3.77424	.00122	.00733
	183	191	4.36730	.00145	.00848
	184	192	4.36730	.00145	.00848
	185	193	3.57443	.00009	.00694
	186	195	2.35311	.00038	.00457
	187	196	5.16594	.00657	.01003
	188	197	7.04200	.00681	.01367
	189	198	.66830	.00003	.00130
	190	199	3.80174	.00330	.00738
	191	202	2.98942	.00000	.00580
	192	203	2.04467	.00031	.00397
	193	204	2.04467	.00031	.00397
	194	205	1.93263	.00208	.00375
	195	206	4.55226	.00049	.00884
	196	207	.44226	.00032	.00086
	197	208	1.14747	.00015	.00223
	198	209	2.17073	.00304	.00422
	199	210	7.69481	.00185	.01494
	200	211	9.80870	.01293	.01905
	201	212	2.27820	.00463	.00442
	202	213	2.27820	.00463	.00442
	203	214	6.16709	.00015	.01197
	204	215	2.01158	.00216	.00391
	205	216	1.84700	.00012	.00359
	206	217	5.18424	.00006	.01007
	207	218	5.58918	.01026	.01085
	208	219	1.97326	.00007	.00383
	209	220	2.78027	.00411	.00540
	210	221	2.48118	.00002	.00482
	211	222	12.58685	.00127	.02444

	212	224	2.59900	.00039	.00505
	213	225	1.23602	.00022	.00240
	214	226	1.81920	.00076	.00353
	215	227	2.31801	.00000	.00450
	216	228	2.52999	.00194	.00491
	217	229	2.52999	.00194	.00491
	218	230	5.08814	.00005	.00988
	219	231	1.17017	.00040	.00227
	220	232	1.14195	.00139	.00222
	221	233	1.44145	.00001	.00280
	222	234	1.44145	.00001	.00280
	223	235	6.84506	.00011	.01329
	224	236	15.01213	.00001	.02915
	225	237	.64180	.00000	.00125
	226	238	8.11094	.00341	.01575
	227	239	3.58641	.00602	.00696
	228	240	15.19682	.00366	.02951
	229	241	4.23244	.00006	.00822
	230	242	4.69302	.00251	.00911
	231	243	6.14690	.00426	.01194
	232	244	.89662	.00012	.00174
	233	245	.85344	.00017	.00166
	234	246	1.24384	.00007	.00242
	235	247	.33314	.00001	.00065
	236	248	2.74051	.00018	.00532
	237	249	.83126	.00086	.00161
	238	250	1.62074	.00254	.00315
	239	252	.39151	.00000	.00076
	240	253	1.05096	.00005	.00204
	241	254	10.67576	.00424	.02073
	242	255	5.36780	.00617	.01042
	243	256	3.97618	.00031	.00772
	244	259	3.20127	.00000	.00622
	245	261	1.30487	.00028	.00253
	246	262	1.30487	.00159	.00253
	247	263	1.30487	.00300	.00253
	248	264	.89989	.00026	.00175
	249	265	.95114	.00000	.00185
	250	266	1.39587	.00000	.00271
	251	267	3.91920	.00152	.00761

	252	268	.39077	.00216	.00076
	253	269	.31363	.00179	.00061
	254	270	11.13662	.00084	.02162
	255	271	10.10446	.00671	.01962
	256	272	3.95075	.00013	.00767
	257	273	1.40588	.00007	.00273
	258	274	6.69319	.00066	.01300
	259	275	1.87202	.00110	.00363
	260	276	.22963	.00041	.00045
	261	277	2.09411	.00014	.00407
	262	278	1.43557	.00004	.00279
	263	279	1.97613	.00018	.00384
	264	280	.39027	.00001	.00076
	265	281	3.69173	.00096	.00717
	266	282	2.37568	.00115	.00461
	267	283	1.75111	.00000	.00340
	268	284	.47752	.00022	.00093
	269	285	.28386	.00032	.00055
	270	286	1.26037	.00347	.00245
	271	288	2.31576	.00038	.00450
	272	289	1.77531	.00290	.00345
	273	290	36.02575	.00354	.06995
	274	291	24.45496	.00934	.04749
	275	292	.23412	.00000	.00045
	276	293	.61124	.00051	.00119
	277	294	1.12304	.00021	.00218
	278	295	.65993	.00056	.00128
	279	296	.56991	.00019	.00111
	280	297	.63620	.00082	.00124
	281	298	.63618	.00004	.00124
	282	299	3.96038	.00030	.00769
	283	300	.99617	.00287	.00193
	284	301	1.56563	.00003	.00304
	285	302	1.29139	.00081	.00251
	286	303	1.28830	.00003	.00250
	287	304	1.34238	.00057	.00261
	288	305	.76942	.00001	.00149
	289	306	.93826	.00007	.00182
	290	307	1.72681	.00055	.00335
	291	308	.66780	.00009	.00130

	292	309	1.89115	.00009	.00367
	293	310	.86997	.00001	.00169
	294	311	.91374	.00000	.00177
	295	312	1.35701	.00016	.00263
	296	313	1.45914	.00041	.00283
	297	314	.79915	.00016	.00155
	298	315	3.01610	.00056	.00586
	299	316	3.01610	.00056	.00586
	300	317	6.83892	.00050	.01328
	301	318	2.48253	.00004	.00482
	302	319	8.09581	.00185	.01572
	303	320	1.33702	.00105	.00260
	304	321	.87136	.00024	.00169
	305	322	2.49239	.00001	.00484
	306	323	.88402	.00042	.00172
	307	324	.93213	.00023	.00181
	308	325	1.57916	.00003	.00307
	309	326	1.50672	.00006	.00293
	310	327	1.61650	.00001	.00314
	311	328	11.70040	.01314	.02272
	312	329	2.37343	.00101	.00461
	313	330	3.40314	.00127	.00661
	314	331	2.61307	.00085	.00507
	315	332	2.35590	.00001	.00457
	316	333	1.21555	.00060	.00236
	317	334	1.10291	.00205	.00214
	318	335	2.24211	.00171	.00435
	319	336	2.77901	.00007	.00540
	320	337	2.99166	.00003	.00581
	321	338	5.81803	.00203	.01130
	322	339	3.17631	.00014	.00617
	323	340	3.17631	.00014	.00617
	324	341	3.61302	.00047	.00702
	325	342	3.95246	.00001	.00767
	326	343	3.95246	.00001	.00767
	327	345	5.88584	.00225	.01143
	328	346	3.37545	.00016	.00655
	329	347	9.49663	.00616	.01844
	330	348	15.73879	.00263	.03056
	331	349	.75073	.00058	.00146

	332	350	5.63923	.00010	.01095
	333	351	2.38037	.00165	.00462
	334	352	6.13736	.00016	.01192
	335	353	1.87171	.00000	.00363
	336	354	2.11058	.00001	.00410
	337	355	12.13542	.00012	.02356
	338	357	10.63464	.00364	.02065
	339	358	10.30458	.00030	.02001
	340	359	7.98954	.00008	.01551
	341	360	15.57126	.00154	.03024
	342	361	7.87116	.00521	.01528
	343	362	3.55534	.00052	.00690
	344	363	8.50136	.00028	.01651
	345	364	3.37487	.00006	.00655
	346	365	2.98920	.00007	.00580
	347	366	3.97673	.00198	.00772
	348	367	2.20441	.00128	.00428
	349	368	12.29593	.00032	.02388
	350	369	5.28694	.00028	.01027
	351	370	.67705	.00068	.00131
	352	371	7.30701	.00059	.01419
	353	372	2.66855	.00054	.00518
	354	373	8.15549	.00260	.01584
	355	374	1.37772	.00100	.00268
	356	375	8.16846	.00189	.01586
	357	376	24.20910	.00531	.04701
	358	377	4.41469	.00055	.00857
	359	378	12.70574	.01441	.02467
	360	379	3.41739	.00006	.00664
	361	380	10.49840	.00005	.02039
	362	381	8.27157	.00000	.01606
	363	382	11.48708	.00216	.02231
	364	383	4.01525	.00006	.00780
	365	384	4.55964	.00125	.00885
	366	385	3.46528	.00139	.00673
	367	386	3.88381	.00035	.00754
	368	387	6.10871	.00416	.01186
	369	388	.92431	.00002	.00179
	370	389	1.29709	.00002	.00252
	371	390	13.43345	.02077	.02608

	372	391	4.48566	.00012	.00871
	373	392	4.25618	.00517	.00826
	374	393	4.15458	.00158	.00807
	375	394	4.64419	.00001	.00902
	376	395	3.05300	.00345	.00593
	377	396	2.74143	.00000	.00532
	378	397	5.90959	.00350	.01147
	379	398	6.09765	.00017	.01184
	380	399	2.88543	.00001	.00560
	381	400	8.40813	.01076	.01633
	382	401	2.32000	.00001	.00450
	383	402	2.93849	.00074	.00571
	384	403	6.71352	.00250	.01304
	385	404	2.41078	.00049	.00468
	386	405	2.50261	.00130	.00486
	387	406	1.54364	.00064	.00300
	388	407	1.17120	.00007	.00227
	389	408	1.10078	.00068	.00214
	390	409	2.48954	.00030	.00483
	391	410	9.22857	.00122	.01792
	392	411	.92634	.00105	.00180
	393	412	1.02334	.00076	.00199
	394	413	18.22876	.00030	.03540
	395	414	5.99149	.00024	.01163
	396	415	7.89352	.00121	.01533
	397	416	10.98964	.00638	.02134
	398	418	1.18892	.00043	.00231
	399	420	7.54307	.00664	.01465
	400	421	.64092	.00055	.00124
	401	422	.23550	.00023	.00046
	402	423	4.00440	.00237	.00778
	403	424	2.00781	.00229	.00390
	404	425	1.40067	.00240	.00272
	405	426	3.17881	.00060	.00617
	406	427	.85706	.00210	.00166
	407	428	3.91878	.00072	.00761
	408	429	5.49159	.00180	.01066
	409	430	6.45459	.00253	.01253
	410	431	2.79357	.00074	.00542
	411	432	3.61524	.00099	.00702

	412	433	1.16581	.00067	.00226
	413	434	1.10213	.00039	.00214
	414	436	5.07537	.00037	.00986
	415	437	3.15592	.00249	.00613
	416	438	2.95844	.00054	.00574
	417	439	.50947	.00013	.00099
	418	440	13.24392	.00065	.02572
	419	441	.30036	.00016	.00058
	420	442	3.67877	.00554	.00714
	421	443	1.64940	.00211	.00320
	422	444	4.15188	.00236	.00806
	423	446	.71871	.00029	.00140
	424	447	.71871	.00029	.00140
	425	448	18.22733	.00084	.03539
	426	449	6.81904	.00071	.01324
	427	450	2.07475	.00001	.00403
	428	451	5.01713	.00000	.00974
	429	452	1.87353	.00000	.00364
	430	453	7.16532	.00002	.01391
	431	454	.80844	.00169	.00157
	432	455	.56977	.00027	.00111
	433	456	.27049	.00002	.00053
	434	457	1.01082	.00015	.00196
	435	458	.69118	.00024	.00134
	436	459	.91186	.00019	.00177
	437	460	.19423	.00014	.00038
	438	461	2.05980	.00040	.00400
	439	462	.30766	.00062	.00060
	440	463	1.46307	.00061	.00284
	441	465	1.48573	.00001	.00288
	442	466	9.76398	.01654	.01896
	443	467	2.59949	.00139	.00505
	444	468	5.57827	.00041	.01083
	445	469	2.65550	.00022	.00516
	446	470	1.44007	.00139	.00280
	447	471	.86935	.00002	.00169
	448	472	2.99133	.00000	.00581
	449	473	2.99133	.00000	.00581
	450	474	10.64032	.00053	.02066
	451	475	7.17223	.00179	.01393

	452	476	10.53214	.00052	.02045
	453	477	27.43647	.00904	.05327
	454	478	3.10051	.00039	.00602
	455	479	17.49596	.00011	.03397
	456	480	9.24430	.00007	.01795
	457	481	3.12983	.00007	.00608
	458	482	16.15992	.00003	.03138
	459	483	8.04392	.00626	.01562
	460	484	13.65415	.01512	.02651
	461	485	2.35326	.00202	.00457
	462	486	12.02622	.00057	.02335
	463	487	7.46634	.00036	.01450
	464	488	3.03034	.00048	.00588
	465	489	6.39138	.00074	.01241
	466	490	9.48092	.00427	.01841
	467	491	5.51051	.00323	.01070
	468	492	5.90945	.00077	.01147
	469	493	19.93401	.00018	.03871
	470	494	5.19646	.00110	.01009
	471	495	7.97110	.00663	.01548
	472	496	3.02113	.00031	.00587
	473	497	6.95298	.00035	.01350
	474	498	6.62996	.00021	.01287
	475	499	13.77077	.01622	.02674
	476	500	5.91702	.00150	.01149
	477	501	2.15951	.00002	.00419
	478	502	3.51491	.00033	.00683
	479	503	2.80218	.00000	.00544
	480	504	1.56029	.00023	.00303
	481	505	8.08375	.00428	.01570
	482	506	9.35861	.00469	.01817
	483	507	3.08649	.00042	.00599
	484	508	10.13792	.00002	.01969
	485	509	9.51463	.00039	.01848
	486	510	8.05820	.00294	.01565
	487	511	1.23845	.00138	.00240
	488	512	5.41723	.00550	.01052
	489	513	2.57194	.00175	.00499
	490	514	8.06995	.00465	.01567
	491	515	10.02551	.00994	.01947

		Total	N		491	491	491
	1	1		1	9.30946	.03202	.01808
		2		6	8.85384	.01789	.01719
		3		14	5.59805	.01969	.01087
		4		44	9.60982	.07286	.01866
		5		46	1.96741	.00668	.00382
		6		57	5.33841	.02831	.01037
		7		165	1.60148	.00423	.00311
		8		185	1.40849	.00385	.00273
		9		194	13.97449	.03477	.02713
		10		200	3.49739	.00809	.00679
		11		201	2.26728	.01074	.00440
		12		223	2.20898	.00746	.00429
		13		251	1.25926	.00363	.00245
		14		257	3.77570	.00821	.00733
		15		258	3.77570	.00821	.00733
		16		260	1.37957	.00791	.00268
		17		287	2.56678	.00600	.00498
		18		344	9.04634	.02249	.01757
		19		356	12.20702	.02743	.02370
		20		417	2.45955	.01007	.00478
		21		419	2.42710	.00581	.00471
		22		435	.66523	.00280	.00129
		23		445	15.52170	.05854	.03014
		24		464	2.49278	.00893	.00484
		25		516	4.22546	.04142	.00820
		Total	N		25	25	25
	Total	N			516	516	516

a. Limited to first 600 cases.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11298.938	4	2824.735	124.731	.000[b]
	Residual	11572.457	511	22.647		
	Total	22871.395	515			

a. Dependent Variable: T_IGD

b. Predictors: (Constant), T_AM, T_IM, T_NF, T_EM

Appendix G

Mediation Analysis

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 4.2 *****************

        Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2022). www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
    Y  : T_IGD
    X  : T_NF
    M  : T_IM

Sample
Size:  516

**************************************************************************
OUTCOME VARIABLE:
 T_IM

Model Summary
        R      R-sq       MSE         F       df1       df2         p
    .0545     .0030    7.1863    1.5330    1.0000   514.0000     .2162

Model
            coeff        se         t         p      LLCI      ULCI
constant   14.2977     .5625   25.4187     .0000   13.1927   15.4028
T_NF        .0178     .0144    1.2382     .2162    -.0104     .0461

**************************************************************************
OUTCOME VARIABLE:
 T_IGD

Model Summary
        R      R-sq       MSE         F       df1       df2         p
    .6468     .4183   25.9348   184.4399    2.0000   513.0000     .0000

Model
            coeff        se         t         p      LLCI      ULCI
constant    3.2611    1.6054    2.0314     .0427     .1072    6.4149
T_NF        .5164     .0274   18.8680     .0000     .4626     .5701
T_IM        .2140     .0838    2.5542     .0109     .0494     .3786

************************** TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 T_IGD

Model Summary
        R      R-sq       MSE         F       df1       df2         p
    .6410     .4109   26.2135   358.5034    1.0000   514.0000     .0000

Model
            coeff        se         t         p      LLCI      ULCI
constant    6.3211    1.0743    5.8839     .0000    4.2105    8.4316
T_NF        .5202     .0275   18.9342     .0000     .4662     .5741


************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
    Effect        se         t         p      LLCI      ULCI
```

```
    .5202     .0275   18.9342     .0000     .4662     .5741

Direct effect of X on Y
    Effect        se         t         p      LLCI      ULCI
    .5164     .0274   18.8680     .0000     .4626     .5701

Indirect effect(s) of X on Y:
       Effect    BootSE  BootLLCI  BootULCI
T_IM     .0038     .0043    -.0033     .0136

************************ ANALYSIS NOTES AND ERRORS *************************

Level of confidence for all confidence intervals in output:
 95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
 1000

------ END MATRIX -----



Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 4.2 *****************

        Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2022). www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
   Y  : T_IGD
   X  : T_NF
   M  : T_EM

Sample
Size:  516

**************************************************************************
OUTCOME VARIABLE:
 T_EM

Model Summary
        R      R-sq       MSE         F       df1       df2         p
    .3343     .1117   88.5435   64.6548    1.0000  514.0000     .0000

Model
            coeff        se         t         p      LLCI      ULCI
constant  37.4367    1.9744   18.9608     .0000   33.5577   41.3156
T_NF        .4060     .0505    8.0408     .0000     .3068     .5052

**************************************************************************
OUTCOME VARIABLE:
 T_IGD

Model Summary
        R      R-sq       MSE         F       df1       df2         p
    .6850     .4693   23.6617  226.7998    2.0000  513.0000     .0000

Model
            coeff        se         t         p      LLCI      ULCI
constant   -.0914    1.3306    -.0687     .9453   -2.7054    2.5226
T_NF        .4506     .0277   16.2716     .0000     .3962     .5050
T_EM        .1713     .0228    7.5122     .0000     .1265     .2161

************************** TOTAL EFFECT MODEL ****************************
```

OUTCOME VARIABLE:
T_IGD

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6410	.4109	26.2135	358.5034	1.0000	514.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	6.3211	1.0743	5.8839	.0000	4.2105	8.4316
T_NF	.5202	.0275	18.9342	.0000	.4662	.5741

********** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **********

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI
.5202	.0275	18.9342	.0000	.4662	.5741

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
.4506	.0277	16.2716	.0000	.3962	.5050

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
T_EM	.0695	.0153	.0420	.1021

********** ANALYSIS NOTES AND ERRORS **********

Level of confidence for all confidence intervals in output:
95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
1000

------ END MATRIX -----

Run MATRIX procedure:

********** PROCESS Procedure for SPSS Version 4.2 **********

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2022). www.guilford.com/p/hayes3

****
Model : 4
Y : T_IGD
X : T_NF
M : T_AM

Sample
Size: 516

****
OUTCOME VARIABLE:
T_AM

Model Summary

R	R-sq	MSE	F	df1	df2	p
.5127	.2629	11.1847	183.3008	1.0000	514.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	3.4258	.7017	4.8820	.0000	2.0472	4.8045

```
T_NF        .2430     .0179    13.5389     .0000     .2077     .2782

**************************************************************************
OUTCOME VARIABLE:
 T_IGD

Model Summary
        R      R-sq       MSE         F       df1       df2         p
    .6686     .4470    24.6541   207.3449    2.0000   513.0000     .0000

Model
           coeff        se         t         p      LLCI      ULCI
constant    5.0224    1.0657    4.7126     .0000    2.9286    7.1161
T_NF         .4281     .0310   13.7944     .0000     .3671     .4890
T_AM         .3791     .0655    5.7889     .0000     .2504     .5077

************************** TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 T_IGD

Model Summary
        R      R-sq       MSE         F       df1       df2         p
    .6410     .4109    26.2135   358.5034    1.0000   514.0000     .0000

Model
           coeff        se         t         p      LLCI      ULCI
constant    6.3211    1.0743    5.8839     .0000    4.2105    8.4316
T_NF         .5202     .0275   18.9342     .0000     .4662     .5741


************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
    Effect        se         t         p      LLCI      ULCI
     .5202     .0275   18.9342     .0000     .4662     .5741

Direct effect of X on Y
    Effect        se         t         p      LLCI      ULCI
     .4281     .0310   13.7944     .0000     .3671     .4890

Indirect effect(s) of X on Y:
        Effect     BootSE   BootLLCI   BootULCI
T_AM     .0921     .0173     .0585     .1260

************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  1000

------ END MATRIX -----
```

Appendix H
Ethical Clearance Approval

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

Re: U/SERC/193/2022

28 September 2022

Dr T'ng Soo Ting
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 T'ng,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your research project and are pleased to inform you that your application has been approved under Expedited Review.

The details of your research project are as follows:

Research Title	Basic Psychological Needs, Gaming Motivations, Internet Gaming Disorder, and Psychological Distress: Through the Lens of Self-Determination Theory
Investigator(s)	Dr T'ng Soo Ting Dr Siah Poh Chua Dr Pragash a/l Muthu Rajan Mr Ho Khee Hoong Dr Pau Kee (UPSI)
Research Area	Social Sciences
Research Location	Malaysia
No of Participants	670 participants (Age: 18 - 29)
Research Costs	UTAR Research Fund 2022 Cycle 1
Approval Validity	28 September 2022 - 27 September 2023

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 you collect personal data of participants in your study, please have the participants sign the attached Personal Data Protection Statement for your records.

The University wishes you all the best in your research.

Thank you.

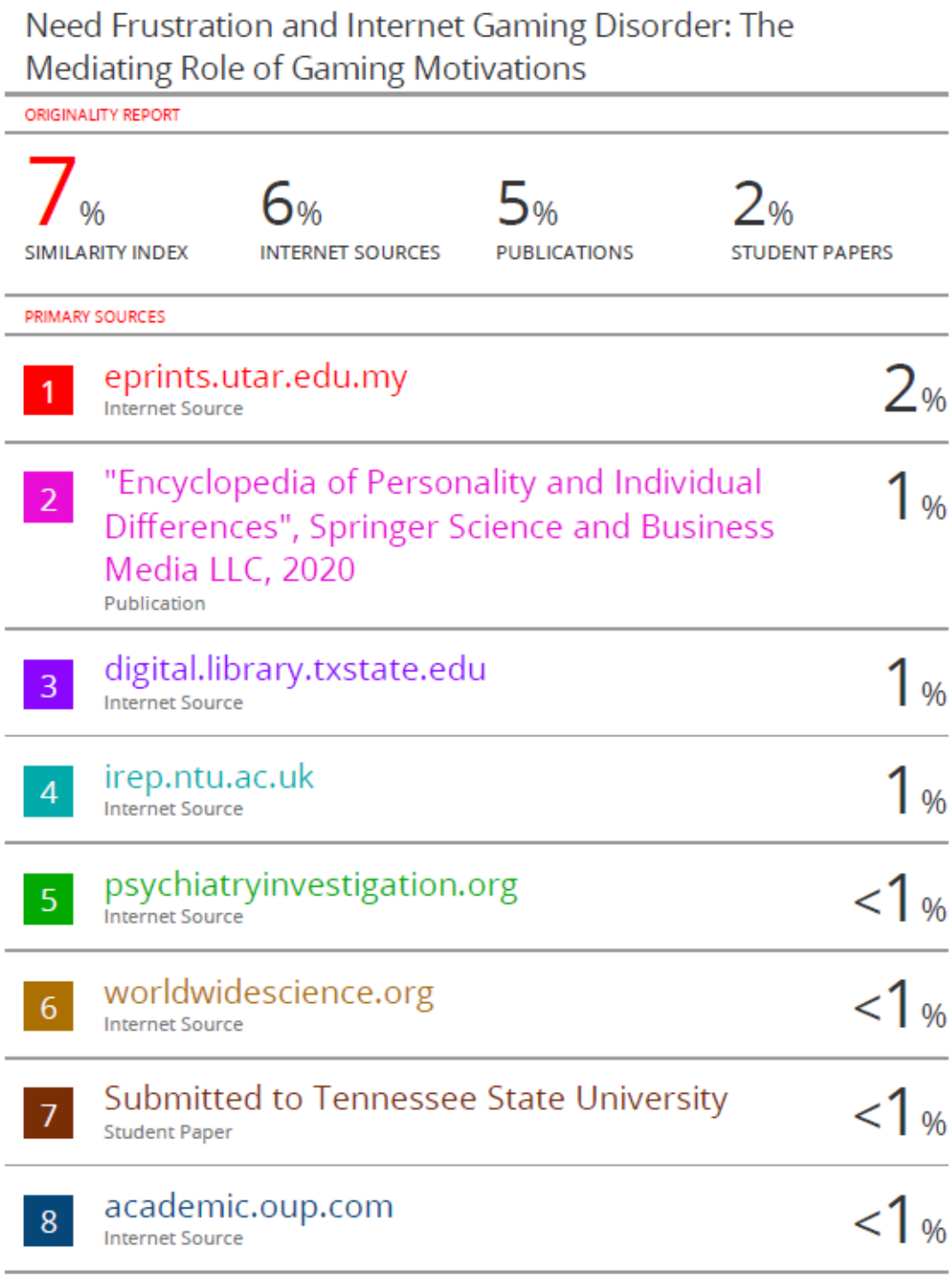
Yours sincerely,

Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Arts and Social Science
Director, Institute of Postgraduate Studies and Research

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 Fax: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 Fax: (603) 9019 8868
Website: www.utar.edu.my

Appendix I: Originality Report (FYP I)



Need Frustration and Internet Gaming Disorder: The Mediating Role of Gaming Motivations

ORIGINALITY REPORT

7%	6%	5%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	eprints.utar.edu.my Internet Source	2%
2	"Encyclopedia of Personality and Individual Differences", Springer Science and Business Media LLC, 2020 Publication	1%
3	digital.library.txstate.edu Internet Source	1%
4	irep.ntu.ac.uk Internet Source	1%
5	psychiatryinvestigation.org Internet Source	<1%
6	worldwidescience.org Internet Source	<1%
7	Submitted to Tennessee State University Student Paper	<1%
8	academic.oup.com Internet Source	<1%

9	Submitted to 97794 Student Paper	<1 %
10	Submitted to Caritas Institute of Higher Education Student Paper	<1 %
11	Frielink, N., C. Schuengel, A. Kroon, and P. J. C. M. Embregts. "Pretreatment for substance-abusing people with intellectual disabilities: intervening on autonomous motivation for treatment entry : Intervening on autonomous motivation for treatment entry", Journal of Intellectual Disability Research, 2015. Publication	<1 %
12	link.springer.com Internet Source	<1 %
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17	Jenn Gallup, Celal Perihan. "chapter 3 Online Gaming Environments as a Potential Conduit	<1 %

	to Support Friendships for Individuals With Autism Spectrum Disorder", IGI Global, 2021 Publication	
18	Seongcheol Kim. "Factors Affecting User Participation in Video UCC (User-Created Contents) Services", Communities and Technologies 2007, 2007 Publication	<1 %
19	Submitted to The Cairnmillar Institute Student Paper	<1 %
20	ir.upsi.edu.my Internet Source	<1 %
21	opus.uleth.ca Internet Source	<1 %
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24	fisherpub.sjf.edu Internet Source	<1 %
25	poa.imed.edu.br Internet Source	<1 %
26	Halley M. Pontes, Mark D. Griffiths. "Assessment of internet gaming disorder in clinical research: Past and present perspectives", Clinical Research and	<1 %

Regulatory Affairs, 2014
Publication

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	On		

Appendix J: Originality Report (FYP II)

FYP 2

ORIGINALITY REPORT

15%	12%	9%	4%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	eprints.utar.edu.my Internet Source	2%
2	Soo Ting T'ng, Khee Hoong Ho, Kee Pau. "Need Frustration, Gaming Motives, and Internet Gaming Disorder in Mobile Multiplayer Online Battle Arena (MOBA) Games: Through the Lens of Self-Determination Theory", International Journal of Mental Health and Addiction, 2022 Publication	2%
3	www.ncbi.nlm.nih.gov Internet Source	1%
4	www.zora.uzh.ch Internet Source	1%
5	aip.scitation.org Internet Source	1%
6	biblio.ugent.be Internet Source	<1%
7	core.ac.uk Internet Source	<1%

8	Submitted to Victoria University Student Paper	<1 %
9	"Peer-Reviewed Abstracts", Research Quarterly for Exercise and Sport, 2014 Publication	<1 %
10	Submitted to University of Southampton Student Paper	<1 %
11	scholarworks.lib.csusb.edu Internet Source	<1 %
12	Submitted to Curtin University of Technology Student Paper	<1 %
13	hdl.handle.net Internet Source	<1 %
14	link.springer.com Internet Source	<1 %
15	repo.uum.edu.my Internet Source	<1 %
16	Dirk Franco, Janaina Macke, Debby Cotton, Arminda Paço, Jean-Pierre Segers, Laura Franco. "Student energy-saving in higher education tackling the challenge of decarbonisation", International Journal of Sustainability in Higher Education, 2022 Publication	<1 %
17	smartech.gatech.edu Internet Source	

		<1 %
18	www.researchgate.net Internet Source	<1 %
19	ruor.uottawa.ca Internet Source	<1 %
20	Submitted to The University of the West of Scotland Student Paper	<1 %
21	lirias.kuleuven.be Internet Source	<1 %
22	rimag.ricest.ac.ir Internet Source	<1 %
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24	Wei Hu, Qiang Han, Jiadong Chu, Na Sun, Tongxing Li, Zhaolong Feng, Qida He, Ze Ma, Yu Wang, Yueping Shen. "Mechanism of the association between sleep quality and mortality in middle-aged and older adults: A prospective study analysis of the UK Biobank", Archives of Gerontology and Geriatrics, 2023 Publication	<1 %
25	bmcpsychiatry.biomedcentral.com Internet Source	<1 %

26	egrove.olemiss.edu Internet Source	<1 %
27	journals.sagepub.com Internet Source	<1 %
28	mafiadoc.com Internet Source	<1 %
29	Øystein Sørebø, Hallgeir Halvari, Vebjørn Flaata Gulli, Roar Kristiansen. "The role of self-determination theory in explaining teachers' motivation to continue to use e-learning technology", Computers & Education, 2009 Publication	<1 %
30	Submitted to Monash University Student Paper	<1 %
31	Sebastiano Costa, Francesca Cuzzocrea, Maria C. Gugliandolo, Rosalba Larcan. "Associations Between Parental Psychological Control and Autonomy Support, and Psychological Outcomes in Adolescents: The Mediating Role of Need Satisfaction and Need Frustration", Child Indicators Research, 2015 Publication	<1 %
32	Submitted to University of Leeds Student Paper	<1 %
33	Yujuan Liu, Brent Ferrell, Jack Barbera, Jennifer E. Lewis. "Development and	<1 %

	evaluation of a chemistry-specific version of the academic motivation scale (AMS-Chemistry)", Chemistry Education Research and Practice, 2017 Publication	
34	dspace.lboro.ac.uk Internet Source	<1 %
35	irep.iium.edu.my Internet Source	<1 %
36	www.frontiersin.org Internet Source	<1 %
37	Submitted to Middle East Technical University Student Paper	<1 %
38	Proksch, Michael, Ulrich R. Orth, and T. Bettina Cornwell. "Competence Enhancement and Anticipated Emotion as Motivational Drivers of Brand Attachment : MOTIVATIONAL DRIVERS OF BRAND ATTACHMENT", Psychology and Marketing, 2015. Publication	<1 %
39	www.ukessays.com Internet Source	<1 %
40	Kieran M. Kingston, Chris S. Horrocks, Sheldon Hanton. "Do multidimensional intrinsic and extrinsic motivation profiles discriminate between athlete scholarship	<1 %

	status and gender?", European Journal of Sport Science, 2006 Publication	
41	discol.umk.edu.my Internet Source	<1 %
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46	www.nejm.org Internet Source	<1 %
47	Beiwen Chen, Maarten Vansteenkiste, Wim Beyers, Liesbet Boone et al. "Basic psychological need satisfaction, need frustration, and need strength across four cultures", Motivation and Emotion, 2014 Publication	<1 %
48	Francesco Ianì, Walter Schaeken, Ivan Nabil Ras, Monica Bucciarelli. "Motor imagery and engagement favour spatial reasoning", Memory & Cognition, 2022 Publication	<1 %

49	files.osf.io Internet Source	<1 %
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Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	On		

Appendix K

FYP II Evaluation Form

UNIVERSITI TUNKU ABDUL RAHMAN
FACULTY OF ARTS AND SOCIAL SCIENCE
DEPARTMENT OF PSYCHOLOGY AND COUNSELLING

UAPZ 3023 Final Year Project II

Quantitative Research Project Evaluation Form

TURNITIN: ***'In assessing this work you are agreeing that it has been submitted to the University-recognised originality checking service which is Turnitin. The report generated by Turnitin is used as evidence to show that the students' final report contains the similarity level below 20%.'***

Project Title: Need frustration and Internet gaming disorder: The mediating role of gaming motivations.	
Supervisor: Dr. Grace T'ng Soo Ting	
Student's Name: 1. Goh Ee-I 2. Ku Yue Kei 3. Lee Xin Qi	Student's ID 1. 2006004 2. 2004909 3. 2005400

INSTRUCTIONS:

Please score each descriptor based on the scale provided below:

1. Please award 0 mark for no attempt.
2. For criteria **7**:
   Please retrieve the marks from "**Oral Presentation Evaluation Form**".

1. ABSTRACT (5%)	**Max Score**	**Score**
a. State the main hypotheses/research objectives.	5%	
b. Describe the methodology: • Research design • Sampling method • Sample size • Location of study • Instruments/apparatus/outcome measures • Data gathering procedures	5%	
c. Describe the characteristics of participants.	5%	
d. Highlight the outcomes of the study.	5%	
e. Conclusions, implications, and applications.	5%	
Sum	25%	/25%
Subtotal (Sum/5)	5%	/5%
Remark:		

2. METHODOLOGY (25%)	**Max Score**	**Score**
a. Research design/framework: • For experiment, report experimental manipulation, participant flow, treatment fidelity, baseline data, adverse events and side effects, assignment method and implementation, masking. (*if applicable with the study design) • For non-experiment, describe the design of the study and data used.	5%	
b. Sampling procedures: • Justification of sampling method/technique used. • Description of location of study. • Procedures of ethical clearance approval. (Provide reference number of approval letter)	5%	
c. Sample size, power, and precision: • Justification of sample size. • Achieved actual sample size and response rate. • Power analysis or other methods (if applicable).	5%	
d. Clear explanation of data collection procedures: • Inclusion and exclusion criteria • Procedures of obtaining consent • Description of data collection procedures • Provide dates/duration of recruitment repeated measures or follow-up. • Agreement and payment (if any)	5%	
e. Explanation of instruments/questionnaire used: • Description of instruments • Scoring system	5%	

• Meaning of scores • Reliability and validity		
Subtotal	25%	/25%
Remark:		

3. RESULTS (20%)	**Max Score**	**Score**
a. Descriptive statistics: • Demographic characteristics • Topic-specific characteristics	5%	
b. Data diagnostic and missing data: • Frequency and percentages of missing data. (if applicable) • Methods employed for addressing missing data. (if applicable) • Criteria for post data-collection exclusion of participants. • Criteria for imputation of missing data. • Defining and processing of statistical outliers. • Analyses of data distributions. • Data transformation (if applicable).	5%	
c. Appropriate data analysis for each hypothesis or research objective.	5%	
d. Accurate interpretation of statistical analyses: • Accurate report and interpretation of confidence intervals or statistical significance. • Report of *p* values and minimally sufficient sets of statistics (e.g., *dfs*, *MS*, *MS error*). • Accurate report and interpretation of effect sizes. • Report any problems with statistical assumptions.	5%	
Subtotal	20%	/20%
Remark:		

4. DISCUSSION AND CONCLUSION (20%)	**Max Score**	**Score**
a. Constructive discussion of findings: • Provide statement of support or nonsupport for all hypotheses. • Analyze similar and/or dissimilar results. • Rational justifications for statistical results.	8%	
b. Implication of the study: • Theoretical implication for future research.	4%	

• Practical implication for programs and policies.		
c. Relevant limitations of the study.	4%	
d. Recommendations for future research.	4%	
Subtotal	20%	/20%
Remark:		

5. LANGUAGE AND ORGANIZATION (5%)	**Max Score**	**Score**
a. Language proficiency	3%	
b. Content organization	1%	
c. Complete documentation (e.g., action plan, originality report)	1%	
Subtotal	5%	/5%
Remark:		

6. APA STYLE AND REFERENCING (5%)	**Max Score**	**Score**
a. 7th Edition APA Style	5%	/5%
Remark:		

***ORAL PRESENTATION (20%)**	**Score**		
	Student 1	Student 2	Student 3
Subtotal	/20%	/20%	/20%
Remark:			

PENALTY	**Max Score**	**Score**
Maximum of 10 marks for LATE SUBMISSION (within 24hours), or POOR CONSULTATION ATTENDANCE with supervisor. *Late submission after 24hours will not be graded	10%	

	Student 1	Student 2	Student 3
****FINAL MARK/TOTAL**	/100%	/100%	/100%

*****Overall Comments:**

Signature: _____ Date: _____

Notes:

1. **Subtotal**: The sum of scores for each assessment criterion
2. **FINAL MARK/TOTAL**: The summation of all subtotal score
3. Plagiarism is **NOT ACCEPTABLE**. Parameters of originality required and limits approved by UTAR are as follows:
   (i) **Overall similarity index is 20% or below**, and
   (ii) **Matching of individual sources listed must be less than 3%** each, and
   (iii) Matching texts in continuous block must **not exceed 8 words**

   Note: Parameters (i)–(ii) shall exclude quotes, references and text matches which are less than 8 words. Any works violate the above originality requirements will NOT be accepted. Students have to redo the report and meet the requirements in **SEVEN (7)** days.

*The marks of "Oral Presentation" are to be retrieved from **"Oral Presentation Evaluation Form".**
**It is compulsory for the supervisor/examiner to give the overall comments for the research projects with A- and above or F grading.

Appendix L

Action Plan Form

Action Plan of UAPZ 3023 (group-based) Final Year Project II for June trimester

Supervisee's Name: Goh Ee-I, Ku Yue Kei, Lee Xin Qi

Supervisor's Name: Dr. T'ng Soo Ting

Task Description	Duration	Date/Time	Supervisee's Signature	Supervisor's Signature	Supervisor's Remarks	Next Appointment Date/Time
Methodology, Data Collection & Data Analysis	W1-W5					10/11/2022
Submit Chapter 3		17/6/2022; 2.13pm			Amendments on Chapter 3	
Amending Chapter 3		26/7/2022; 12.00pm				17/11/2022
Findings & Analysis	W6-W8					
Submit Chapter 4: Results		26/7/2022; 8.33pm			Amendments on Chapter4	18/11/2022
Amending Chapter 4: Results		1/8/2022; 12.00pm				23/11/2022
Discussion & Conclusion	W8-9					
Submit Chapter 3: Proposed Methodology		14/8/2022; 9.36pm			Amendments on Chapter 5	26/11/2022
Amending Chapter 3: Methodology		20/8/2022; 11.39am				
Submission of first draft*	Monday of W10	submit the first draft to Turnitin.com to check similarity rate				
Amendment						
Submission of final*	Monday of W11	final submission to supervisor				
Oral Presentation		Oral Presentation Schedule will be released and your supervisor will inform you				

Notes:
1. **The listed duration is for reference only, supervisors can adjust the period according to the topics and content of the projects.**
2. ***Deadline for submission can not be changed, one mark will be deducted per day for late submission.**
3. **Supervisees are to take the active role to make appointments with their supervisors.**
4. **Both supervisors and supervisees should keep a copy of this record.**
5. **This record is to be submitted together with the submission of the FYP II.**

Appendix M
Supervisor's Comments on Originality Report

Universiti Tunku Abdul Rahman			
Form Title : Supervisor's Comments on Originality Report Generated by Turnitin for Submission of Final Year Project Report (for Undergraduate Programmes)			
Form Number: FM-IAD-005	Rev No.: 0	Effective Date: 01/10/2013	Page No.: 1of 1

FACULTY OF ARTS AND SOCIAL SCIENCE

Full Name(s) of Candidate(s)	GOH EE-I, KU YUE KEI, LEE XIN QI
ID Number(s)	20AAB06004, 20AAB04909, 20AAB05400
Programme / Course	PY
Title of Final Year Project	Need Frustration and Internet Gaming Disorders: The Mediating Role of Gaming Motivations

Similarity	**Supervisor's Comments (Compulsory if parameters of originality exceeds the limits approved by UTAR)**
Overall similarity index: 15 % **Similarity by source** Internet Sources: 12 % Publications: 9 % Student Papers: 4 %	
Number of individual sources listed of more than 3% similarity: -	

Parameters of originality required and limits approved by UTAR are as follows:
(i) Overall similarity index is 20% and below, and
(ii) Matching of individual sources listed must be less than 3% each, and
(iii) Matching texts in continuous block must not exceed 8 words
Note: Parameters (i) – (ii) shall exclude quotes, bibliography and text matches which are less than 8 words.

Note Supervisor/Candidate(s) is/are required to provide softcopy of full set of the originality report to Faculty/Institute

Based on the above results, I hereby declare that I am satisfied with the originality of the Final Year Project Report submitted by my student(s) as named above.

_____ _____
Signature of Supervisor Signature of Co-Supervisor

Name: _____ Name: _____

Date: _____ Date: _____

Appendix N

Signed Permission Sheet

FACULTY OF ARTS AND SOCIAL SCIENCE

UNIVERSITI TUNKU ABDUL RAHMAN

Date: 28 August 2023

SUBMISSION OF FINAL YEAR PROJECT

It is hereby certified that Goh Ee-I (ID No: 20AAB06004) has completed this final year project entitled
"Need frustration and Internet gaming disorder: The mediating role of gaming motivations" under the supervision of Dr. Grace T'ng Soo Ting (Supervisor) from the Department of Psychology and Counselling, Faculty of Arts and Social Science.

I understand that University will upload softcopy of my final year project in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

Yours truly,

_____
(Goh Ee-I)

FACULTY OF ARTS AND SOCIAL SCIENCE

UNIVERSITI TUNKU ABDUL RAHMAN

Date: 28 August 2023

SUBMISSION OF FINAL YEAR PROJECT

It is hereby certified that Lee Xin QI (ID No: 20AAB05400) has completed this final year project entitled
"Need frustration and Internet gaming disorder: The mediating role of gaming motivations" under the supervision of Dr. Grace T'ng Soo Ting (Supervisor) from the Department of Psychology and Counselling, Faculty of Arts and Social Science.

I understand that University will upload softcopy of my final year project in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

Yours truly,

_____
(Lee Xin Qi)

FACULTY OF ARTS AND SOCIAL SCIENCE

UNIVERSITI TUNKU ABDUL RAHMAN

Date: 28 August 2023

SUBMISSION OF FINAL YEAR PROJECT

It is hereby certified that Ku Yue Kei (ID No: 20AAB04909) has completed this final year project entitled
"Need frustration and Internet gaming disorder: The mediating role of gaming motivations" under the supervision of Dr. Grace T'ng Soo Ting (Supervisor) from the Department of Psychology and Counselling, Faculty of Arts and Social Science.

I understand that University will upload softcopy of my final year project in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

Yours truly,

_____
(Ku Yue Kei)