Relationship between Online Game Addiction and Mental Well-Being of High-School students during the Covid-19 Pandemic: Implications for Learning and Development

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Keywords	**Abstract**
high-school students, online game addiction, mental well-being	This quantitative-correlational study aimed to examine the relationship between online game addiction and mental well-being of high school students from Angeles City, in the Philippines, during the Covid-19 pandemic. To obtain data from the respondents, the Internet Gaming Disorder Scale-Short-Form and Depression, Anxiety, and Stress Scale (DASS-21) were utilised. After obtaining data from purposively selected 162 high-school students, it was observed that there was a positive and significant relationship between online game addiction and mental well-being. The study highlighted that individuals who are highly dependent on online games are more likely to experience higher levels of depression, anxiety and stress. Based on the findings, implications for theory and practice, particularly in learning and development, are presented, along with recommendations for schools, teachers, students, and future research directions.

Introduction

Online gaming is one of the most widely used leisure activities. There are several reasons why some people play video games online: (a) stress relief, (b) challenge and competition, (c) relaxation, (d) enjoyment, (e) social interaction, and (f) mental escape from the real world (Dumrique & Castillo, 2018). Furthermore, according to the same authors, the internet, as a source of information, plays an essential role in improving people's daily lives, especially in enabling productive work in schools, offices, and at home. Today, this can be a person's most efficient strategic tool for enabling themselves to take charge of and cope with the ever-changing technology. The internet has become one of the necessities for most human beings, regardless of age or gender, in today's digital era. However, the influence of this helpful technology on youth is undeniably questionable.

Mobile game addiction has drawn scholars' attention as an emerging form of addictive behaviour, distinct from typical online gaming addiction on desktop computers because of its potential negative implications on mental well-being. However, due to a lack of specialised tools for measuring this new type of behavioural addiction, relatively little research has specifically studied the association between mobile gaming addiction and mental health effects. For example, the study of Wang et al. (2019) looked at the connections between adolescent social anxiety, depression, and loneliness and mobile game addiction. The results demonstrated that social anxiety, despair, and loneliness were all positively correlated with mobile game addiction.

Furthermore, male teenagers reported higher levels of social anxiety when they played mobile games compulsively, according to further examination of gender differences in the pathways from mobile game addiction to these mental health effects.

According to WePC (2023), there were more than 2.5 billion gamers worldwide, of which 912 million were from the Asia Pacific Region. The prevalence of gaming among youth in East and South-East Asian countries was 10%-15%. In the Philippines, there were 29.9 million gamers, of which 42% were males between the ages of 10 and 35 (Labana et al., 2020). Most alarmingly, at that time, gamers worldwide were predicted to rise to 2.7 billion by 2021. The global and local statistics suggest that the number of gamers increases yearly. Thus, another reason for study was countries' concerns when formulating public health approaches to this increasing trend (World Health Organization, n.d.).

Literature Review

Factors Influencing Online Game Addiction

Many factors can influence students to be more addicted to playing online games. Online game addiction has become a significant problem worldwide, and it could negatively impact children in many ways, with regard to their physical health, learning, emotion, and behaviour. Online game addiction has been mainly found in children and youth aged 15 to 24 (Viriyapong & Sookpiam, 2019). With this, online game addiction significantly impacts holistic health worldwide, and the most vulnerable populations are children and adolescents. The study of Viriyapong and Sookpiam is relevant to this present study as the majority of contemporary gamers are children. Certain individuals neglect their physical well-being, which can ultimately have an impact on their mental well-being in future years. Furthermore, according to previous studies on online game addiction, this falls into the category of a gaming disorder (Heng et al., 2021). Being recurrent and persistent in gaming can cause students to procrastinate in school and lose motivation, affecting their academic performance. Furthermore, addiction has significantly impacted students' level of performance, particularly in academics. Since this study took place during the Covid-19 pandemic, it found students had more time to use their mobile phones, resulting in play that consumed their whole day, and their satisfaction with that may eventually lead to not attending school.

Addiction to the internet, which is reportedly a broad concept interpreted as such that it includes online gaming, lowers motivation to study, leading to procrastination when tasks are deprioritised or left idle (Lardinoix et al., 2023). According to various studies, online gaming addiction impacts students' motivation to study. Additionally, their addiction significantly affects their interest in attending school and detracts from their lifestyle, studies, and even their mental well-being. Research supports the concern that online game addiction reduces the willingness of students to study and learn, which may lead to other problems. It reveals that other factors can influence students to become addicted to online games, including peer pressure.

On the other hand, it has been revealed that students lacking knowledge of online video games may encounter difficulties in forming connections (Eskasasnanda, 2017). Moreover, students are disinterested in schoolwork due to their excessive involvement in online gaming. In addition, individuals who are not acquainted with online video games may require assistance in establishing social connections. An upsurge in internet consumption was noted among children during the Covid-19 pandemic. Age, gender, depression, and stress are determinants that can potentially exacerbate students' susceptibility to online gaming addiction (Dong et al., 2020).

Factors Influencing Mental Well-Being

It has been determined that social interaction factors into escaping loneliness, expanding online bridging social capital, and strengthening offline bonding social capital (Kim & Kim, 2017). With this, social interaction is one of the factors that may influence students' mental well-being. Online games have become a part of everyday life because such games provide opportunities for users to play with or against others and consequently make friends or strengthen existing relationships. Social interaction has consequences that can be very negative. A person, who becomes a victim of cyberbullying, may face a subsequent challenge that leads to mental changes causing a nervous breakdown (Makarova & Makarova, 2019). This literature shows that when students play online games, there is a possibility that it may affect their mental well-being through cyberbullying. This study also shows that social interaction is one factor that may influence students' mental well-being.

Moreover, other variables, including perceived social support, family demands, socioeconomic status, gender, and educational background, can affect mental well-being, which comprises two sub-components: stress and depression, both leading to poor mental well-being (Shujaat, 2018). According to Goh et al. (2019), less attention has been given to the positive impact of online gaming on psychological well-being, such as helping players to develop social skills, fostering a social support network, enhancing positive affect, and improving well-being. Recent findings indicate that engaging in online gaming can enhance individuals' ability to communicate effectively with their fellow players. Engaging in online games facilitates the enhancement of social skills through the opportunity for individuals to interact with others. This factor demonstrates the beneficial impact of online games on individuals' well-being, although some scholars have failed to acknowledge these positive effects.

On the other hand, loneliness is an unpleasant experience that derives from significant deficiencies in a person's network of social relationships. Previous studies have consistently confirmed the connection between loneliness and online game addiction (Spilková et al., 2017). It has been discovered that more possible negative factors could influence students' mental well-being when playing online games than positive factors. This study also found a link between loneliness and online game addiction.

Online Video Games vis-à-vis Mental Well-Being

The impact of online video games on mental well-being has been extensively researched, uncovering both positive and negative consequences. Research has demonstrated that engaging in moderate amounts of gaming can develop cognitive abilities, alleviate stress, and foster social relationships via means of online communities. Granic et al. (2014) have emphasised that video games can promote social skills and alleviate anxiety and depression by offering a source of relaxation and a method of dealing with stress. In contrast, an excessive amount of gaming has been associated with adverse consequences, including addiction, isolation from social interactions, and heightened levels of anxiety and despair. As mentioned by Przybylski and Weinstein (2017), excessive gaming can have negative psychological consequences, even while moderate gaming can be advantageous. In addition, a study conducted by Almutairi et al. (2023) indicated that harmful gaming behaviours are frequently linked to underlying mental health problems, highlighting the need for a well-rounded approach to gaming. Moreover, Kuss and Griffiths (2012) conducted further investigation and found evidence that excessive gaming is associated with several mental health issues, including depression, anxiety, and social phobias. Likewise, the study conducted by Lemmens et al. (2011) discovered a correlation between

pathological gaming and heightened degrees of loneliness, depression, and sub-par academic performance. In general, although online video games can have a favourable impact on mental well-being, it is important to exercise moderation in order to prevent any negative consequences.

The literature study uncovered a dichotomous effect of online video games on mental well-being, with research emphasising both advantageous and harmful impacts contingent upon the degree of engagement. Although moderate gaming has been demonstrated to improve cognitive function, reduce stress, and promote social connections, excessive gaming can result in addiction, social seclusion, and heightened levels of anxiety and depression. Nevertheless, there is a significant lack of study regarding the exact effect of online game addiction on the mental well-being of high school students in the Philippines during the Covid-19 pandemic. This study sought to investigate the influence of excessive gaming behaviours during the pandemic on students' mental health. The findings of this study could provide valuable insights for developing methods to assist the overall development of adolescents in the face of educational disruptions and increased screen usage.

Research Objectives

The main focus of this present study was to assess the relationship between online game addiction and mental well-being of high school students during the onslaught of the Covid-19 virus. Based on this, the following research questions were formulated:

1. How can the demographic profile and playing history of the respondents be described?
2. What is the relationship between online game addiction and the level of mental well-being of the respondents?
3. What is the implication of the result of this study for theory and practice, specifically for learning and development?

Methods

Methodology

This study employed a quantitative research design, specifically using a correlational approach, to examine the association between online game addiction and mental well-being among high school students in Angeles City, Pampanga, Philippines. Furthermore, the present study has utilised survey questionnaires to gather data from all participants. Online data gathering can optimise scalability and expedite data collection, while also minimising costs (Regmi et al., 2017).

Sample

The respondents were selected from three junior high (Grades 7-10) and senior high (Grades 11-12) schools in Angeles City, Pampanga, Philippines. *Quota sampling*, a method ensuring specific proportions of sub-groups within a population, was used to achieve a representative sample of 200 students, regardless of grade level. The Covid-19 pandemic imposed limitations such as restricted access to schools and limited face-to-face interactions, making it challenging to gather respondents for the study. The study's approach ensured a balanced distribution across different grades and demographics despite these constraints. Furthermore, the data collection was conducted during the zenith of the Covid-19 pandemic, covering the period from February to June 2021. Most importantly, this study developed a set of criteria to get the most reliable and precise data from the participants:

1. Junior or Senior high-school students residing in Angeles City, Pampanga, Philippines;
2. Any gender orientation;
3. Ages between 12-18 years, with parental consent; and,
4. Respondents actively involved in online gaming and engaged in this activity for at least six months throughout the pandemic.

Instrument

The study included a three-part online survey questionnaire. The first section gathered data regarding the demographic characteristics and gaming background of the target respondents. The second part of the instrument was a modified version of the Internet Gaming Disorder Scale-Short-Form developed by Poon et al. (2021). This instrument assesses the extent to which individuals experience internet gaming disorder. The reliability of the instrument from the original study was 'good' with CA (α) = 0.81. Lastly, the Depression, Anxiety, and Stress Scale (DASS-21) by Lovibond and Lovibond (1995) was adopted. This questionnaire specifically assesses the levels of depression, anxiety, and stress that high-school students encounter while engaging in online gaming activities. Based on the recent study of Laranjeira et al. (2023), the reliability of the instrument is 'excellent' with CA (α) = 0.90. Therefore, these instruments could be used for this present study.

Data Analysis

In order to obtain accurate findings, upon achieving the desired quota, the subsequent methods of quantitative statistical treatment were executed: (1) The *Pearson correlation coefficient* was used to determine the associations between two or more variables. (2) The *Chi-square statistic* measured the extent of disparities between the expected and actual results, taking into account the sample size and the number of variables involved in the relationship. Most importantly, since demographic characteristics of the respondents fell under the categorical variable, this statistical method was highly appropriate.

Ethical Statement

The respondents were informed about the study's objectives, the instruments, and the constructs that would be measured. Additionally, the researchers provided the results of the study to their college and the scientific community. The respondents were required to provide their consent by clicking the agreement that was attached in Google Forms. They were also given the freedom to decide whether to participate or decline. Participants were also informed that there might be minor risks in their participation in the study, such as the feeling of being uncomfortable in answering personal and sensitive survey questions. Likewise, they were told that no monetary compensation would be provided for giving information. Given these circumstances, participants were free to withdraw or to ask for a debriefing of the study at any time.

Results and Discussion

Table 1 presents a demographic profile of gamers, and it shows that of the 162 respondents, 61.73% or 100 respondents ranged from 15-17 years old, while 8.02% or 13 respondents ranged from 12-14 years old. On the other hand, the outcomes show that the highest total of respondents was males, 47.53% or 77 respondents, while the lowest was members of the LGBTQIAP+ community, 6.17% or 10 respondents. Most students playing online games were from public schools, 82.72% or 134 respondents, and some were from private schools, 17.28% or 28

respondents. High school students were more active in playing online games. The table shows that 64.20% or 104 respondents are from junior high school, and 5.80% or 58 respondents are from senior high school. Furthermore, the results show that for the grade level, the highest total was 52.47%, or 85 respondents from Grade 10, and the lowest was 2.47%, or four respondents from Grade 8.

Table 1: Demographic Profile of Gamers

Variables	Item	*N*(%)
Age	*12-14years old*	*13*(8.02%)
	15-17 years old	*100*(61.73%)
	18 years old and above	*49*(30.25%)
Gender	*Male*	*77*(47.53%)
	Female	*75*(46.30%)
	LGBTQIAP+	*10*(6.17%)
School	*Public*	*134*(82.72%)
	Private	*28*(17.28%)
Level	*Junior High School*	*104*(64.20%)
	Senior High School	*58*(35.80%)
Grade Level	*Grade 7*	*7*(4.32%)
	Grade 8	*4*(2.47%)
	Grade 9	*13*(8.02%)
	Grade 10	*85*(52.47%)
	Grade 11	*18*(11.11%)
	Grade 12	*35*(21.60)

Table 2 illustrates the gaming history of the respondents. In terms of the length of playing, a significant portion (43.83%), had been playing for six months to a year, suggesting a relatively recent interest or involvement in gaming. However, there was also a notable group with 4-5 years of experience (30.86%), indicating a sustained commitment to gaming activities over time. Regarding the frequency of playing per week, nearly half of the respondents (47.53%) played daily, reflecting a high level of dedication and routine in their gaming participation. Those who played 1-2 times a week constituted 26.54%, followed by 3-4 times a week (19.14%), and a smaller percentage (6.79%) played 5-6 times a week. This variability highlighted different levels of engagement among the respondents. Additionally, when it came to the number of games per day, the majority (56.79%) engaged in 1-3 games daily, suggesting moderate activity levels. A significant portion (30.25%) played 4-6 games, indicating higher intensity, while smaller groups engaged in 7-10 games (9.88%) or other frequencies (3.09%). Moreover, the length of playing time per day showed that most respondents (43.21%) spent 1-2 hours on gaming, with another significant group (33.33%) dedicating 3-4 hours daily. Smaller percentages spent 5-6 hours (9.88%), 7-8 hours (3.70%), or more than 9 hours (9.88%) per day, indicating varying levels of play time. Also, game initiation data revealed that a majority of respondents (72.84%) initiated their own games, suggesting a proactive approach to their gaming involvement. Only 27.16% did not initiate games, relying on external organisation or invitations.

Meanwhile, influences on gaming participation were primarily social, with friends being the most significant factor (46.91%). Personal choice also played a crucial role (31.48%), while family (15.43%), classmates (3.09%), and other influences (3.09%) had lesser impacts. Significantly, the purpose of playing games was predominantly to relieve stress (56.79%), highlighting the therapeutic benefits of gaming activities. Other motivations included killing time and alleviating boredom (30.86%) and training for competition (9.88%), with a small percentage citing other reasons (2.47%). Finally, the data showed that a vast majority of respondents (75.93%) had played other types of games, indicating a broad interest in various gaming activities and versatility in their gaming experiences. Only 24.07% had not engaged in other types of games, suggesting a more focused or specialised gaming participation.

Table 2: Gaming History of the Respondents

Variables	Item	*N* (%)
Length of playing	6 months-1 year	*71* (43.83%)
	2-3 years	*41* (25.31%)
	4-5 years	*50* (30.86%)
Frequency of playing/week	1-2 times a week	*43* (26.54%)
	3-4 times a week	*31* (19.14)
	5-6 times a week	*11* (6.79%)
	Daily	*77* (47.53%)
Number of games/days	1-3	*92* (56.79%)
	4-6	*49* (30.25%)
	7-10	*16* (9.88%)
	Others	*5* (3.09%)
Length of playing time/day	1-2 hours	*70* (43.21%)
	3-4 hours	*54* (33.33%)
	5-6 hours	*16* (9.88%)
	7-8 hours	*6* (3.70%)
	More than 9	*16* (9.88%)
Game Initiation	Yes	*118* (72.84%)
	No	*44* (27.16%)
Considered influencer	Friends	*76* (46.91%)
	Family	*25* (15.43%)
	Classmates	*5* (3.09%)
	Personal choice	*51* (31.48%)
	Others	*5* (3.09%)
Purpose of playing	To relieve stress	*92* (56.79%)
	To kill time and boredom	*50* (30.86%)
	To train for competition	*16* (9.88%)
	Others	*4* (2.47%)
Played other sports	Yes	*123* (75.93%)
	No	*39* (24.07%)

Table 3 illustrates that the frequency of playing and game initiation was significantly associated with online game addiction. This means that the more frequently they played, the more they became addicted, and those who initiated the game tend to be more addicted. However, the remaining data did not exhibit any notable correlation. According to Müezzin (2015), the use of computers and the internet, as well as engaging in online gaming, were identified as influential variables contributing to the development of online game addiction. In this regard, the association between more frequent games and a greater risk of addiction implies a possible link where extended exposure to gaming signals can worsen addictive tendencies. Furthermore, the discovery that individuals who start gaming become more susceptible to addiction may indicate inherent tendencies or susceptibilities that make certain individuals more likely to develop problematic gaming habits (Kaya et al., 2023). Gaining an understanding of these underlying characteristics could provide valuable insights for developing focused interventions that try to identify and prevent gaming addiction at an early stage.

Furthermore, exploring the root causes for excessive video game playing, such as the desire for social interaction or the need to manage stress, can offer a useful understanding of the psychological mechanisms that fuel addictive behaviours in young people. Through unravelling these intricacies, prospective research can provide insights for implementing more refined strategies to tackle online gaming addiction and foster healthy patterns of technology usage among high school students. Additionally, Aristoteles et al. (2020) have emphasised that teenagers who play online games generally spend their time playing online games an average of four to six hours a day. As the frequency of playing online games increases, the detrimental effect also increases (Greenberg & Kurtmen, 2019). In connection with this, the results indicate that high-school students generally spend four to six hours per day engaging in online gaming, highlighting the significant involvement of such an activity in their lives, which may have an influence on different aspects of their overall well-being. Furthermore, the association between more frequent gaming and greater negative impacts indicates a troubling pattern, in which excessive gaming habits can worsen adverse outcomes such as poor academic performance and strained social relationships (Sun et al., 2023). This observation aligns with the increasing apprehension regarding the problem of online gaming addiction, specifically among young people, indicating its recognition as a noteworthy public health concern (Labana et al., 2020). The widespread appeal of online games among teenagers has elevated its status as a pervasive element of modern culture, requiring comprehensive efforts to comprehend and tackle the underlying mechanisms that drive the addictive behaviours in this field of study.

Table 3: Chi-square Test between Online Game Addiction Level and Demographic Profile and Playing History

Profile	X^2	df	Phi	Cramer's V	p
Age	6.229	4	.196	.139	.183
Gender	6.964	4	.207	.147	.138
School	5.497	2	.184	.184	.064
Length of playing	2.854	4	.133	.094	.583
Frequency of playing	16.658	6	.321	.227	.011
No. of games/day	9.375	6	.241	.170	.154
Playing time/day	15.466	8	.309	.218	.051
Game initiation	14.388	2	.298	.298	.001
Influencer	9.517	8	.242	.171	.301
Purpose	4.077	6	.159	.112	.666
Other sports	1.028	2	.080	.080	.598

Note: Significance is at $p < .05$.

Table 4 illustrates that there is no significant relationship between the demographic profile and playing history on the mental well-being level of the students, which means that other factors may affect the mental well-being level of high-school students. The variables being studied had nothing to do with their mental well-being. Numerous studies have also been able to illustrate that there is a significant difference concerning psychological well-being relating to gender (Li et al., 2022), and other demographic characteristics. The Chi-square test was employed due to the categorical nature of the variables being examined for their correlation with mental well-being. Replicating the study with a different population may either corroborate or refute the findings of this study's results.

Table 4: Chi-Square Test between Mental Well-being Level and Demographic Profile, and Playing History

Profile	X^2	df	Phi	Cramer's V	p
Age	2.063	4	.113	.080	.724
Gender	.573	4	.059	.042	.966
School	1.553	2	.098	.098	.460
Length of playing	.992	4	.078	.055	.911
Frequency of playing	4.269	6	.162	.115	.640
No. of games/day	3.873	6	.154	.109	.699
Playing time/day	4.903	8	.174	.123	.768
Game initiation	2.525	2	.125	.125	.283
Influencer	5.042	8	.176	.125	.753
Purpose	10.830	6	.259	.183	.094
Other sports	.244	2	.039	.039	.885

Note: Significance is at $p < .05$.

Table 5 depicts the association between online game addiction and mental well-being. Based on the findings, there is a notable correlation between addiction to online games and one's mental well-being. Consequently, individuals with a more pronounced addiction to online gaming will experience a corresponding increase in DAS. Likewise, the study of Wang et al. (2019) investigated the correlation between mobile game addiction and social anxiety, sadness,

and loneliness in adolescents. The study revealed a positive correlation between mobile game addiction and social anxiety, depression, and loneliness. The study's findings highlight the intricate association between excessive online gaming and mental health outcomes among teenagers, specifically highlighting the positive correlation between mobile game addiction and social anxiety, depression, and loneliness. This correlation implies a possible two-way relationship, where individuals who have increased levels of social anxiety, depression, or loneliness may be more likely to turn to mobile gaming as an intermittent refuge or distraction. Nevertheless, the temporary relief offered by gaming can ultimately worsen experiences of social exclusion and emotional distress, resulting in a harmful cycle of ineffective coping mechanisms and deteriorating mental health consequences (Lin et al., 2021). Moreover, the noted positive correlation emphasises the widespread influence of addiction to mobile games on different aspects of psychological well-being, emphasising the necessity for comprehensive treatments that tackle both the addictive behaviours and their underlying mental health concerns (Barr & Copeland-Stewart, 2022). Through acknowledging the intricate relationship between mobile game addiction and mental health, solutions can be customised to address fundamental psychological susceptibilities and encourage the adoption of more beneficial coping strategies among adolescents.

Table 5: Correlation between Online Game Addiction and Mental Well-Being

	Online Game Addiction	
	r-value	*p-value*
Depression	.435	<.001
Anxiety	.421	<.001
Stress	.523	<.001
Overall mental well-being	.490	<.001

Conclusion

The current study on the relationship between online gaming addiction and high school students' mental well-being during the Covid-19 pandemic provides valuable insights for teachers and parents. It is essential to be cognizant of the risks associated with excessive mobile gaming during times of anxiety and isolation. Educators and families should be provided with resources and information to help recognise indicators of addiction and promote appropriate technology consumption. By establishing a supportive environment, families can improve their children's well-being during and even after a pandemic. Teachers may incorporate digital literacy and responsible technology use into their educational courses, preparing students to properly navigate the digital world. Educational institutions should continue to prioritise student well-being, including support for those struggling with online gaming addiction. Collaboration among stakeholders can result in an embracing learning environment that promotes healthy technological habits and overall well-being.

In this regard, educational institutions can address gaming addiction by raising awareness and providing specialised support programmes, such as counselling and mental health services. Educational seminars and training workshops on digital citizenship and stress management can help students and families get the information and skills they need to utilise technology more responsibly. Despite the inherent drawbacks, online gaming can provide benefits such as socialisation and a sense of achievement. Recognising these benefits, educational institutions

may help students improve their social-emotional skills and resilience by responsibly incorporating it into classrooms.

A notable caveat of the study is its narrow scope, as it only examined students from particular junior and senior high schools in the Philippines. Although this cohort provides useful insights into the issue of online game addiction and well-being within its specific setting, its findings may not be applicable to a broader community. Future research endeavours should aim to incorporate a wider and more inclusive sample, comprising individuals from multiple areas throughout the Philippines and different backgrounds. Researchers can develop a more thorough knowledge by examining the different ways individuals engage in online gaming and how it impacts their well-being across various cultural, social, and geographical contexts. Additionally, by doing comparative evaluations between rural and urban locations or different educational environments, researchers can gain a further understanding of the intricate dynamics of online game addiction and its effects on student well-being. Additionally, longitudinal and comparative investigations may help identify effective treatments and guide focused support for different student demographics.

Implications for Learning and Development: From the Philippines to a Global Perspective

The findings of this study have profound significance for both the theoretical understanding and practical utilisation of all aspects of learning and development. In theory, it emphasises the two-fold nature of online gaming as both a potential hazard and an alternative way of dealing with stress, underscoring the necessity for a well-rounded strategy in educating students about digital skills that recognises both risks and benefits.

Practically, educators from the Philippines and around the world should incorporate these insights into their teaching practices, encouraging safe technology use while recognising the benefits of online gaming. This includes developing programmes that address digital citizenship, appropriate gaming practices, and mental health awareness. As mentioned earlier, support systems such as counselling services and workshops to help students successfully regulate their technology use and improve their overall well-being should be prioritised. Przybylski and Weinstein (2017) and Király et al. (2014) highlighted the significance of digital literacy and maintaining a healthy gaming routine in enhancing the mental health and well-being of students. These studies emphasise the necessity of teaching programmes that tackle the potential dangers and advantages of online gaming, hence, strengthening the key findings of present study.

By proactively and strategically tackling these barriers at both local and global levels, educational institutions have the ability to establish inclusive learning environments that enable students to excel intellectually and socially in a digitally interconnected world.

References

Almutairi, T.A., Almutairi, K.S., Ragab, K.M., Nourelden, A.Z., Assar, A., Matar, S., Rashid, H.H., Elsayed, M., Fathallah, A.H., Spitzer, M., Schönfeldt-Lecuona, C., Albazee, E., Klib, M., &

Hassan, Z. M. (2023). Prevalence of internet gaming disorder and its association with psychiatric comorbidities among a sample of adults in three Arab countries. *Middle East Current Psychiatry*, *30*(1), 8. https://doi.org/10.1186/s43045-023-00280-x

Aristoteles, Rini, P.S., & Poddar, S. (2020). The correlation between frequency of playing online games and teen communication on nursing students in STIKes Muhammadiyah Palembang. *Enfermería Clínica*, *30*, 1–5. https://doi.org/10.1016/j.enfcli.2019.11.014

Barr, M., & Copeland-Stewart, A. (2022). Playing video games during the COVID-19 pandemic and effects on players' well-being. *Games and Culture*, *17*(1), 122-139. https://doi.org/10.1177/15554120211017036

Dong, H., Yang, F., Lu, X., & Hao, W. (2020). Internet addiction and related psychological factors among children and adolescents in china during the coronavirus disease 2019 (COVID-19) epidemic. *Frontiers in Psychiatry*, *11*. https://doi.org/10.3389/fpsyt.2020.00751

Dumrique, D.O., & Castillo, J.G. (2018). Online gaming: Impact on the academic performance and social behavior of the students in Polytechnic University of the Philippines Laboratory High School. *KnE Social Sciences*, *3*(6), 1205. https://doi.org/10.18502/kss.v3i6.2447

Eskasasnanda, I.D.P. (2017). Causes and effects of online video game playing among junior-senior high school students in Malang East Java. *KOMUNITAS: International Journal of Indonesian Society and Culture*, *9*(2), 191-202. https://doi.org/10.15294/komunitas.v9i2.9565

Goh, C., Jones, C., & Copello, A. (2019). A further test of the impact of online gaming on psychological wellbeing and the role of play motivations and problematic use. *Psychiatric Quarterly*, *90*(4), 747-760. https://doi.org/10.1007/s11126-019-09656-x

Granic, I., Lobel, A., & Engels, R.C.M.E. (2014). The benefits of playing video games. *American Psychologist*, *69*(1), 66-78. https://doi.org/10.1037/a0034857

Greenberg, L., & Kurtmen, D. (2019). Screening for screen time. In *Adolescent health screening: An update in the age of big data* (pp. 245–250). Elsevier. https://doi.org/10.1016/B978-0-323-66130-0.00018-1

Heng, S., Zhao, H., & Wang, M. (2021). In-game social interaction and gaming disorder: A perspective from online social capital. *Frontiers in Psychiatry*, *11*. https://doi.org/10.3389/fpsyt.2020.468115

Kaya, A., Türk, N., Batmaz, H., & Griffiths, M.D. (2023). Online gaming addiction and basic psychological needs among adolescents: The mediating roles of meaning in life and responsibility. *International Journal of Mental Health and Addiction*. https://doi.org/10.1007/s11469-022-00994-9

Kim, Y.-Y., & Kim, M.-H. (2017). The impact of social factors on excessive online game usage, moderated by online self-identity. *Cluster Computing*, *20*(1), 569-582. https://doi.org/10.1007/s10586-017-0747-1

Király, O., Nagygyörgy, K., Griffiths, M.D., & Demetrovics, Z. (2014). Problematic online gaming. In *Behavioral addictions* (pp. 61-97). Elsevier. https://doi.org/10.1016/B978-0-12-407724-9.00004-5

Kuss, D.J., & Griffiths, M.D. (2012). Internet gaming addiction: A systematic review of empirical research. *International Journal of Mental Health and Addiction*, *10*(2), 278-296. https://doi.org/10.1007/s11469-011-9318-5

Labana, R.V., Hadjisaid, J.L., Imperial, A.R., Jumawid, K.E., Lupague, M.J.M., & Malicdem, D.C. (2020). Online game addiction and the level of depression among adolescents in Manila, Philippines. *Central Asian Journal of Global Health*, *9*(1). https://doi.org/10.5195/cajgh.2020.369

Laranjeira, C., Querido, A., Sousa, P., & Dixe, M.A. (2023). Assessment and psychometric properties of the 21-Item Depression Anxiety Stress Scale (DASS-21) among Portuguese higher education students during the COVID-19 pandemic. *European Journal of Investigation in Health, Psychology and Education*, *13*(11), 2546-2560. https://doi.org/10.3390/ejihpe13110177

Lardinoix, J., Neumann, I., Wartberg, L., & Lindenberg, K. (2023). Procrastination predicts future internet use disorders in adolescents but not vice versa: Results from a 12-month longitudinal study. *Healthcare*, *11*(9), 1274. https://doi.org/10.3390/healthcare11091274

Lemmens, J.S., Valkenburg, P.M., & Peter, J. (2011). Psychosocial causes and consequences of pathological gaming. *Computers in Human Behavior*, *27*(1), 144-152. https://doi.org/10.1016/j.chb.2010.07.015

Li, Y., Zuo, M., Peng, Y., Zhang, J., Chen, Y., Tao, Y., Ye, B., & Zhang, J. (2022). Gender differences influence gender equality awareness, self-esteem, and subjective well-being among school-age children in China. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.671785

Lin, P.-C., Yen, J.-Y., Lin, H.-C., Chou, W.-P., Liu, T.-L., & Ko, C.-H. (2021). Coping, resilience, and perceived stress in individuals with internet gaming disorder in Taiwan. *International Journal of Environmental Research and Public Health*, *18*(4), 1771. https://doi.org/10.3390/ijerph18041771

Lovibond, P.F., & Lovibond, S.H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, *33*(3), 335-343. https://doi.org/10.1016/0005-7967(94)00075-U

Makarova, E.L., & Makarova, E.A. (2019). Aggressive behavior in online games and cybervictimization of teenagers and adolescents. *International Electronic Journal of Elementary Education*, *12*(2), 157-165. https://doi.org/10.26822/iejee.2019257663

Müezzin, E. (2015). An investigation of high school students' online game addiction with respect to gender. *Turkish Online Journal of Educational Technology*, *2015*(July), 55-60.

Poon, L.Y. J., Tsang, H.W.H., Chan, T.Y.J., Man, S.W.T., Ng, L.Y., Wong, Y.L.E., Lin, C.-Y., Chien, C.-W., Griffiths, M.D., Pontes, H.M., & Pakpour, A.H. (2021). Psychometric properties of the Internet Gaming Disorder Scale–Short-Form (IGDS9-SF): Systematic review. *Journal of Medical Internet Research*, *23*(10), e26821. https://doi.org/10.2196/26821

Przybylski, A.K., & Weinstein, N. (2017). A large-scale test of the Goldilocks Hypothesis. *Psychological Science*, *28*(2), 204-215. https://doi.org/10.1177/0956797616678438

Regmi, P.R., Waithaka, E., Paudyal, A., Simkhada, P., & Van Teijlingen, E. (2017). Guide to the design and application of online questionnaire surveys. *Nepal Journal of Epidemiology*, *6*(4), 640-644. https://doi.org/10.3126/nje.v6i4.17258

Shujaat, N. (2018). Factors affecting the mental well-being of undergraduate students in Karachi. *Advances in Social Sciences Research Journal*, *5*(3). https://doi.org/10.14738/assrj.53.3704

Spilková, J., Chomynová, P., & Csémy, L. (2017). Predictors of excessive use of social media and excessive online gaming in Czech teenagers. *Journal of Behavioral Addictions*, *6*(4), 611-619. https://doi.org/10.1556/2006.6.2017.064

Sun, R.-Q., Sun, G.-F., & Ye, J.-H. (2023). The effects of online game addiction on reduced academic achievement motivation among Chinese college students: The mediating role of learning engagement. *Frontiers in Psychology*, *14*. https://doi.org/10.3389/fpsyg.2023.1185353

Viriyapong, R., & Sookpiam, M. (2019). Education campaign and family understanding affect stability and qualitative behavior of an online game addiction model for children and youth in Thailand. *Mathematical Methods in the Applied Sciences*, *42*(18), 6906-6916. https://doi.org/10.1002/mma.5796

Wang, J.-L., Sheng, J.-R., & Wang, H.-Z. (2019). The association between mobile game addiction and depression, social anxiety, and loneliness. *Frontiers in Public Health*, *7*. https://doi.org/10.3389/fpubh.2019.00247

WePC. (2023). *Video game industry statistics, trends and data in 2023*. https://www.wepc.com/news/video-game-statistics/

WHO. (n.d.). *Gaming disorder*. World Health Organization. https://www.who.int/standards/classifications/frequently-asked-questions/gaming-disorder#:~:text=Gaming

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during the Covid-19 Pandemic: Implications for learning and development. *Journal of Learning for Development*, *11*(2), 289-303.