

## CHAPTER EIGHTEEN

### **The Mediating Roles of Maladaptive Gaming Cognitions and Purpose in Life in the Relationship Between Relatedness Need Dissatisfaction and Internet Gaming Disorder Among Chinese University Students**

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#### **ABSTRACT**

Guided by Self-Determination Theory and Social Cognitive Theory, this study aimed to investigate the risk effect of dissatisfaction in psychological need on Internet gaming disorder (IGD), as well as the potential mediating effects of a generic sense of purpose in life and maladaptive gaming-specific outcome expectancy beliefs. With a cross-sectional design, 525 Chinese university students ( $M_{age} = 20.18$  years,  $SD_{age} = 1.62$ ; 53.7% male) voluntarily completed an anonymous paper-and-pencil questionnaire regarding their Internet gaming. Our findings showed that, as hypothesized, students' dissatisfaction in need for relatedness correlated negatively with purpose in life, and positively with negative outcome expectancies of reducing gaming and IGD tendency. IGD tendency also correlated negatively with purpose in life and positively with negative outcome expectancies. Moreover, results of a path analysis with bootstrapping showed support for a partial mediating effect of negative outcome expectancies of cutting back gaming on the relationship between relatedness need dissatisfaction and IGD tendency. The study will provide practical insight into the design of cost-effective school-based IGD-prevention/intervention programs.

**Keywords:** Gaming Disorder, Self-Determination Theory, Relatedness, Life Purpose, Outcome Expectancy, Chinese University Students.

## INTRODUCTION

The World Health Organization (2019) has officially recognized gaming disorder as an addictive disorder. Internet Gaming Disorder (IGD) is manifested as a preoccupation with Internet games and a lack of control over one's gaming behaviour, leading to multiple negative consequences. The American Psychiatric Association has also called for further investigation into IGD in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013). The latest Statistical Report on Internet Development in China from the China Internet Network Information Center (2021) shows that the online gaming population in mainland China has been on the rise and has reached 517 million as of the end of 2020, accounting for 52.4% of all netizens. Given such a large proportion of Internet gamers, it is not surprising to observe prevalence of IGD as high as 14.8% to 19.0% in university populations (Tang et al., 2018; Zhang et al., 2019), compared with 2% of the Chinese community-dwelling adult population in the same region (Wu et al., 2018).

From a cognitive psychopathology perspective, maladaptive beliefs such as overvaluing the rewards of gaming increase IGD tendency and severity (Forrest et al., 2016). Maladaptive outcome expectancy beliefs on the functions and/or consequences of gaming have been well identified as risk factors for IGD (King & Delfabbro, 2014, 2016). On the other hand, having a sense of meaning and purpose in life could serve as a protective factor against IGD (Zhang et al., 2019). However, there is a lack of theory-based research on the associations of universal psychological traits (e.g., psychological needs and purpose in life) with gaming-

specific beliefs, as well as their interplay in influencing IGD development and maintenance. Grounded in Self Determination Theory (SDT; Ryan & Deci, 2000), this study aimed to investigate whether maladaptive cognition of outcome expectancies of gaming and having a sense of purpose in life would mediate the effect of one of the three basic psychological needs—need for relatedness—on IGD tendency among Chinese university students.

### **Psychological Need Dissatisfaction and Purpose in Life**

Based on SDT, three basic psychological needs are crucial in guiding human behaviours and expected of a mentally healthy person: (1) Autonomy (choice and volition to engage in an activity); (2) competence (effective or capable functioning in the physical or social world); and (3) relatedness (connectedness with and belonging to other people and the world). These three innate psychological needs are the basis for intrinsic motivation to set and plan for life goals, develop one's potential, and attain personal growth.

In accordance with previous studies on addictive behaviours such as exercise addiction, social networking addiction, and problematic video gaming (Costa et al., 2016; Wu et al., 2013; Yu et al., 2016), dissatisfaction or low satisfaction with one's basic psychological needs will tend to impede their personal growth and can even increase their vulnerability to behavioural addictions (such as IGD). To take competence as an example, a plausible explanation for such relationship is that when an individual is dissatisfied with their competence, they would want to perform well and feel effective in their own abilities in an activity, such as gaming, as a compensation. This may lead to developing a behavioural addiction.

Sense of relatedness has been identified as the only significant need construct for gaming addiction among the three basic psychological needs in Chinese young adults (Wu et al., 2013), which is plausible in the context of such a collectivistic culture. A recent study of

Chinese students in a vocational college of higher education in mainland China also found that dissatisfaction in the need for relatedness was the only significant factor for IGD symptoms among all six types of basic psychological need satisfaction and dissatisfaction (Hui et al., 2019). To facilitate designing of effective interventions, further research is warranted to elucidate the psychological mechanism(s) underlying the relationship between dissatisfaction in the need for relatedness and IGD in Chinese university students.

Purpose in life refers to the sense of having reasons for living and a life worth living, with clear goals and directions (Ryff, 1995; Ryff & Keyes, 1995). Previous studies have confirmed that having a purpose in life is a potential protective factor against addictive behaviours such as smartphone addiction and IGD (e.g., Cevik et al., 2020; Wu et al., 2013; Zhang et al., 2019), as well as a mediator between psychological factors and addictive behaviours (e.g., Harlow et al., 1986; Wu et al., 2013). Grounded in SDT, previous cross-sectional research among Chinese young adults has shown that in addition to the direct effect of having a sense of relatedness, there were indirect effects of psychological needs on problem gaming via purpose in life (Wu et al., 2013). This finding suggests that dissatisfaction with psychological needs might result in young adults losing their sense of purpose in life, which could in turn drive them to excessive gaming. The second aim of the current study, therefore, was to test whether this mediating effect of having a purpose in life could be replicated in Chinese university students. We hypothesized that dissatisfaction in the need for relatedness would be associated with less sense of purpose in life, which in turn would be positively associated with IGD tendency.

### **Maladaptive Gaming Cognition: Negative Outcome Expectancies of Reducing Gaming**

According to Davis' (2001) cognitive-behavioural model of Internet addiction, maladaptive cognitions regarding Internet use increases susceptibility to IGD. Young adults, including university students, perceive less understanding and fewer negative consequences of IGD than their older counterparts (Lau et al., 2020) and are therefore vulnerable to maladaptive beliefs related to gaming.

According to Social Cognitive Theory (Bandura, 1997, 2006), outcome expectancy—the consequences one expects from their behaviour—serves as a major motivator for human behaviors. In the current study, we focused on negative outcome expectancies of reduced gaming, (i.e., believing in possible adverse consequences from reducing one's game use) because the risk effect of negative outcome expectancies of Internet-related addictions had been consistently reported in Chinese samples (e.g., Lin et al., 2008; Wu et al., 2013; Wu, Lau, et al., 2016). For example, Wang et al. (2016) provided longitudinal evidence that when Chinese secondary school students perceived more barriers or adverse consequences of reducing Internet use, they were more likely to develop Internet addiction in the following year. When a person perceives more negative outcomes of reduced gaming, it acts as a disincentive to spend less time gaming and they are less likely to do so, and hence more likely to develop addiction.

Negative outcome expectancies have also been found to mediate the relationship between psychological factors and addictive behaviours (e.g., Anthenien et al., 2017; Urban et al., 2008). In a sample of Chinese university students, Yu et al. (2016) reported that higher levels of relatedness need dissatisfaction (i.e., loneliness) were associated with more negative outcome expectancies of reduced social networking use (e.g., losing contact with friends and

losing competence, feeling left out and lost), which in turn was associated with tendency towards social networking addiction.

Drawing on SDT to interpret these findings, dissatisfaction in the need for relatedness may lead gamers to expect that reducing their gaming would lead to more negative or even ego-threatening outcomes, such as diminished social connection with friends and lower self and social competence. This in turn may lead to continuation of excessive online gaming, or even more indulgence in it. We therefore hypothesized there would be a mediating effect of negative outcome expectancies of reduced gaming between dissatisfaction in the need for relatedness and IGD tendency.

### **The Present Study**

This study hypothesized a partial mediation model, in which dissatisfaction in the need for relatedness would have a direct effect on IGD tendency, and two indirect effects via negative outcome expectancies of reduced gaming and purpose in life. The relationships of dissatisfaction in the need for relatedness and negative outcome expectancies with IGD tendency were hypothesized to be positive, while that of purpose in life was hypothesized to be negative. A bootstrapping approach was used in this study to test both hypothesized mediations with a sample of Chinese university students.

## **METHOD**

### **Participants and Procedures**

The sample was composed of 525 Chinese university students recruited in Beijing, China ( $M_{age} = 20.18$  years,  $SD = 1.62$ ), with 282 males (53.7%) and 243 females (46.3%). Of the participants, 212 (40.4%) were Year 1 students, 119 (22.7%) Year 2, and 192 (36.5%) Year

3 or above. Since age was highly correlated with study year, only the former was controlled for in the data analysis. Regarding academic performance, 308 (58.7%) reported average scores for the past semester between 80 and 89, 134 (25.5%) reported mean scores between 70 and 79, 46 (8.8%) between 60 and 69, 24 (4.6%) between 90 and 100, and 9 (1.7%) reported mean scores less than 60. The ethics approval for conducting this study was obtained from the Department of Psychology of the corresponding author's affiliation.

## Measures

### *IGD*

The IGD-20 Test (Pontes et al., 2014), validated for use among Chinese university students by Yu et al. (2019), was used to measure the level of Internet gaming disorder of participants. It is a 20-item measure using 5-point Likert response scales (1 = *never* to 5 = *always*), with higher scores indicating higher tendency toward Internet gaming addiction. The IGD-20 Test demonstrated good reliability in the present study ( $\alpha = .90$ ).

### *Dissatisfaction in Need for Relatedness*

Following the study on video gaming among Chinese young people by Wu et al. (2013), the Chinese version of the 8-item UCLA Loneliness Scale (ULS-8) was used as an indicator of participants' dissatisfaction in the need for relatedness (i.e., their sense of loneliness). Originally developed by Russell and colleagues (1978), this scale was revised to the 8-item version (ULS-8) by Hays and DiMatteo (1987). Items are rated on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*), with higher scale scores indicating a higher level of loneliness, and thus more dissatisfaction in the need for relatedness. Sample items include "I

feel isolated from others” and “people are around me but not with me.” The scale demonstrated good reliability in our Chinese university student sample ( $\alpha = .81$ ).

### ***Negative Outcome Expectancies of Reduced Gaming***

Following previous studies on Internet addiction (Wang et al., 2016) and social networking addiction (Yu et al., 2016) among Chinese students, this study adapted their scale items for IGD to measure negative outcome expectancies of reduced gaming. There were six items about the potential consequences following reduced gaming (i.e., losing confidence, feeling old fashioned, losing contact with friends, having less fun, making life less convenient, and feeling lost). They are rated on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*), with higher scale scores indicating a higher perceived likelihood of the negative outcomes from reducing gaming. The reliability of the scale was good in this study ( $\alpha = .92$ ).

### ***Purpose in Life***

The six-item form of the Purpose in Life Scale (PIL; Crumbaugh & Maholick, 1964; McKenna & West, 2007) was used to measure participants’ sense of purpose in life. Participants were asked to rate on a 6-point bipolar response scale on statements such as “I regard my ability to find a purpose or mission in life (1 = *practically none* to 6 = *very great*)” and “Life to me seems (1 = *completely routine* to 6 = *always exciting*)”. Higher scores indicate a stronger sense of a purpose-driven life. The scale showed good reliability in our Chinese student sample ( $\alpha = .86$ ).

### ***Demographics***

The participants were asked to provide demographic information, including gender, age (years), year of study, and academic performance. Academic performance is often rated on a



scale from 0 to 100 at schools in China, which can be considered equivalent to grade A (90-100), B (80-89), C (70-79), D (60-69), and Fail (<60). Therefore, academic performance was measured by the average score of courses in the past semester on a 5-point scale from 1 (<60) to 5 (90-100) in this study. Regarding gaming involvement, the participants were asked to provide information on the average amount of time and money (1.00 CNY  $\approx$  0.14 to 0.16 USD) spent on Internet gaming on a weekly basis.

### **Data Analysis**

All statistical analyses were conducted with SPSS 24. The preliminary analyses (i.e., descriptive analysis and bivariate correlations) of all key variables were examined first. The proposed mediation model was first examined with Hayes' (2013) PROCESS macro for SPSS, with 5,000 replications in bootstrapping. Considering their significant correlations, the effects of gender, weekly gaming time, and weekly gaming expenses on IGD tendency were controlled in the model. Either the  $p$  value or 95% confidence intervals (CI) were reported for examining the significance of the results, depending on the analysis.

## **RESULTS**

### **Preliminary analysis**

Table 1 shows the means, standard deviations, and correlation coefficients of all psychological and demographic variables. The average time and expenses spent on gaming on a weekly basis, were 10.32 hours ( $SD = 11.87$ ) and CNY40.57 ( $SD = 450.75$ ) respectively. For IGD tendency, a mean score of 2.10 ( $SD = 0.70$ ) and a score range from 1 to 4.16 were found. Gender, with female coded as 0 and male as 1, had a significant positive correlation with IGD tendency,  $r = .40$ ,  $p < .001$ . Academic performance had a significant negative correlation with

IGD tendency,  $r = -.28, p < .001$ . Significant positive correlations were also found with IGD tendency for weekly gaming time,  $r = .39, p < .001$ , and weekly expenses on gaming,  $r = .19, p < .001$ .

As expected, IGD tendency was positively correlated with dissatisfaction in the need for relatedness,  $r = .27, p < .001$ , negatively with purpose in life,  $r = -.12, p < .01$ , and positively with negative outcome expectancies of reduced gaming,  $r = .67, p < .001$ .

**Table 1**

*Descriptive statistics and Pearson r coefficients among all variables of the Chinese university students*

	M	SD	1	2	3	4	5	6	7	8	9
1. IGD tendency	2.14	0.66	--								
2. Relatedness need dissatisfaction	2.54	0.68	.27***	--							
3. Negative outcome expectancies	1.94	0.89	.67***	.29***	--						
4. Purpose in life	4.09	0.91	-.12**	-.31***	-.15**	--					
5. Weekly Game Time	10.32	11.87	.39***	.05	.31***	-.08	--				
6. Weekly Game Expense	40.57	450.75	.19***	.06	.16**	-.15**	.33***	--			
7. Academic performance	3.56	0.79	-.28***	-.13**	-.29***	.15**	-.32***	-.17***	--		
8. Age	20.18	1.62	-.08	-.05	.01	.09*	-.02	.06	-.01	--	
9. Gender	--	--	.40***	.12**	.35***	-.02	.39***	.07	-.33***	.06	--

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Negative outcome expectancies = Negative outcome expectancies of reduced gaming; Gender: 0 = female, 1 = male.

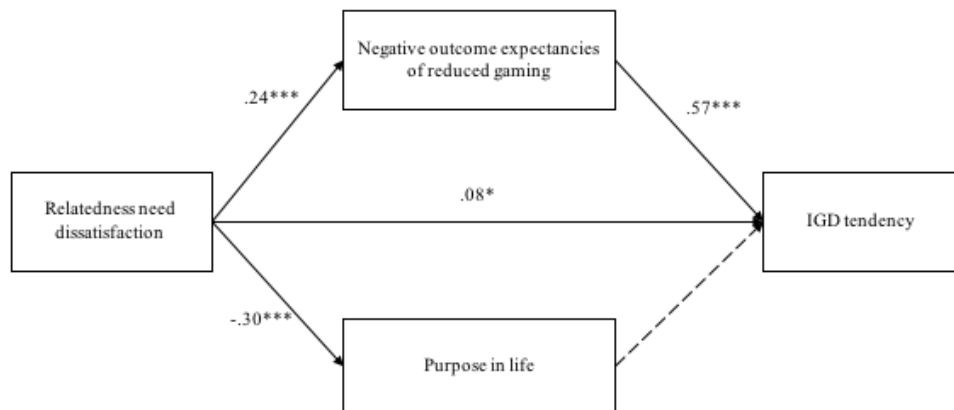
### Testing the Mediating Effect

We tested the hypothesized partial mediation model with both purpose in life and negative outcome expectancies of reduced gaming as mediators. When controlling for gender and GPA with all variables, the model (Figure 1) showed good fit:  $\chi^2(1) = 1.28, \chi^2/df = 1.28, p = .259, CFI = .999, GFI = .999, RMSEA = .023, 90\% CI [.000, .124], SRMR = .011$ , and explained 40.8% of the variance in IGD tendency, together with the demographic variables.

Dissatisfaction in the need for relatedness had a significant direct effect on IGD tendency,  $\beta = .08$ , 95% CI [.01, .15], as did negative outcome expectancies of reduced gaming,  $\beta = .57$ , 95% CI [.50, .64], whereas that of purpose in life on IGD tendency was not significant,  $\beta = -.002$ , 95% CI [-.07, .07]. The indirect effect of dissatisfaction in the need for relatedness on IGD tendency mediated via purpose in life was also not significant,  $\beta = .002$ , 95% CI [-.02, .02]. However, negative outcome expectancies of reduced gaming did serve as a significant mediator, with an indirect effect of dissatisfaction in the need for relatedness on IGD tendency,  $\beta = .14$ , 95% CI [.09, .19].

**Figure 1**

*The path model testing the mediating effects of purpose in life and negative outcome expectancies of reducing game use on the relation between relatedness need dissatisfaction and IGD tendency*



*Notes.* Standardized coefficients are presented. Non-significant paths are represented by dashed lines.

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

## DISCUSSION

Consistent with self-determination theory, dissatisfaction in the need for relatedness was positively correlated with IGD tendency in our sample of Chinese university students. The effects of the three basic psychological needs on well-being and/or ill-being have been argued

to be generally universal across cultures and populations (Chen et al., 2014), and our findings provided additional evidence to support this argument. Specifically, we shed light on the mediating mechanism of how needs for relatedness may influence the development of IGD. The partial mediation model tested in this study was of good fit and explained over 40% of variance in IGD tendency.

As hypothesized, participants who had a higher level of maladaptive gaming-specific cognitions (i.e., negative outcome expectancies of reduced gaming in this case) reported higher IGD tendency. This finding was consistently convergent with an experimental study by Hou et al. (2020) that demonstrated negative outcome expectancies of gaming would lead to lower impulsivity in playing Internet games among students with IGD (Hou et al., 2020). Moreover, expectation of negative outcomes from reduced gaming mediated the effect of dissatisfaction in the need for relatedness on IGD tendency. Our finding of the significant association between dissatisfaction in need for relatedness and IGD tendency converges with findings of previous studies, where students' perceived social support was found to be closely related to their satisfaction with the three basic psychological needs—particularly the need for relatedness (George et al., 2013; Tian et al., 2015)—as well as lower vulnerability to IGD (Yu et al., 2018).

To individuals with a low sense of relatedness, Internet gaming may serve as the only source of social networking through which they can fulfill their need for relatedness (e.g., McLean & Griffiths, 2019). Many gamers initiate gaming with the motive of socializing (both online and offline) with their peers through common conversation topics, and they continue in order not to lose those conversation topics or feel alienated (Beranuy et al., 2012). Such a motive has been positively associated with perceived in-game relatedness and gaming time (Wu, Lai, et al., 2016). Indeed, playing multiplayer online games in which players share

common goals and fight in the same team can be a fast and budget-friendly way to get along with others and fit in (Chappell et al., 2006).

As Internet gaming may serve as a media platform for gamers to engage together and stay connected interpersonally, they may perceive more aversive social consequences after they reduce their gaming involvement. Given the expectation of loss they may have with less gaming, they are extremely vulnerable to excessive gaming and IGD, since the perceived cost outweighs the possible positive outcomes of less gaming, despite warnings about problems related to such highly addictive behaviours.

Although the zero-order correlations of purpose in life with dissatisfaction in the need for relatedness and IGD tendency were significant as expected, the mediating effect of purpose in life demonstrated in a previous study of Chinese young adults (Wu et al., 2013) was not replicated in our university student sample. This might be due to the overlapping variance accounted for by a number of predictor variables in the path analysis. With the presence of maladaptive cognition concerning the negative outcome expectancies following less gaming in the model, which appears to be a very powerful predictor for IGD, and together with the significant direct effect of dissatisfaction in the need for relatedness, the effect of purpose in life may diminish and become non-significant. Given these inconsistent findings, future research with longitudinal design is warranted to reveal the interplay among need satisfaction, purpose in life, maladaptive gaming beliefs, and IGD in other age or student groups, as well as population samples of different sociocultural backgrounds.

In line with previous studies (e.g., Su et al., 2020), males showed higher tendency to IGD than females, and our male participants also spent more time on gaming than their female counterparts. However, female gamers should not be given less attention because they can also

suffer from severe IGD (e.g., Lopez-Fernandez et al., 2019), and there has been a substantial increase in “girl games,” designed for and targeted at females in the growing game industry (Cummings, 2018; Near, 2013; Vermeulen & Van Looy, 2016).

The only effect of age in this study was on the level of purpose in life, wherein older and more senior students tended to possess a stronger sense of purpose and meaning in life, suggesting they might be better adjusted to university life. Consistent with previous studies of Chinese university students in other regions (such as Macao and southern suburb of Beijing; e.g., Jiang, 2014; Yang et al., 2021; Zhang et al., 2019), academic performance had a significant negative correlation with IGD tendency. It is highly plausible that IGD may result in poorer academic performance.

### **Limitations**

This study had some limitations that should be acknowledged. The cross-sectional design did not allow us to test the causal relationship between dissatisfaction in the need for relatedness and IGD tendency. Future research should endeavor to investigate the (bi)directional relationship with a longitudinal design. Furthermore, the generalization of the findings in the present study to other student populations in other age or cultural groups is unknown, given the current conveniently recruited sample of Chinese university students.

### **Implications and Recommendations**

Our findings have some important practical implications for designing cost-effective prevention and/or intervention programs in universities. Firstly, they support that dissatisfaction in need for relatedness is a universal risk factor for ill-being, including IGD. In order to improve such dissatisfaction among students, schools are recommended to implement

leisure activities to bring students together, such as communicative and physical activities, which have been found to be associated with more satisfaction in the need for relatedness (Leveren et al., 2012) and less psychological distress (Doré' et al., 2016).

Effects of the education system and parenting styles on such dissatisfaction should also be further studied and properly intervened if possible. For example, teachers' controlling practices in the classroom may undermine students' relatedness satisfaction (Niemic & Ryan, 2009). Therefore, intervention programs should not only focus on students, but also take into consideration parents and educators in the context of their culture. Teachers should promote "improving together" policies rather than focusing on rankings and emphasizing competition in the education system to foster collaborative and group-based cooperative learning environment. Secondly, the profound mediating effect of anticipated negative outcomes associated with less gaming suggests that altering such maladaptive cognition may effectively reduce vulnerability to IGD. Students who anticipate and worry about negative consequences of less gaming may regard gaming as the only or one of the few social entertainments and conversation topics for staying connected with their peers due to its 24/7 accessibility and budget friendliness. Students should be forewarned of this risky cognitive factor, and at the same time provided with information on alternative activities for establishing interpersonal relationships and maintaining social connection.

To prevent students from anticipating any adverse consequences of less gaming, students can be educated and reassured with opportunities for various offline social activities with common group goals (e.g., team sports, playing music in orchestra). The support from schools in the provision of venues and facilities is crucial for this. Schools can also play an essential role in providing an environment that encourages leisure-time social activities, such

as student associations and school clubs where students who have common interests can meet and socialize. Team-based extra-curricular activities (e.g., sports, arts, religion, volunteering) can be promoted to enhance student confidence, group belonging and social attachment. Furthermore, specific physical education focusing on team sport-based activities that require relatedness-supportive training and practices may offer interpersonally engaging environments for students to fulfill their need for social belonging (Sparks et al., 2015; Wallhead et al., 2013). Upon regular engagement in offline social activities, students may perceive a stronger sense of relatedness and fewer negative outcomes associated with less gaming.

## **Conclusion**

The present study was the first to identify negative outcome expectancies of less gaming as a potent mediating factor between dissatisfaction in the need for relatedness and IGD tendency among Chinese university students. Gamers who have a low sense of relatedness may play for social reasons to fulfill their desire for relatedness through Internet gaming, and therefore worry more about the losing the social contacts, connection and activities with friends. They are therefore less likely to discontinue, and more likely to pursue even more excessive gaming. The practical insight for educators and counsellors is to provide cost-effective school-based IGD-prevention/intervention programs to create a relatedness-supportive learning environment, and also to provide education and facilities for viable alternative activities so that students will anticipate less negative outcomes if they reduce or stop their gaming.



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