With High New Media Literacy, Can We Prevent Problematic Internet Use? -- A Case Study of Chinese College Students

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ABSTRACT

Problematic Internet use (PIU) can lead to dysfunction and undesired consequences, especially in adolescents and youths. Studies have shown that personal emotional characteristics and relationships with others are associated with PIU. We pursue the neglected question of whether there is a correlation between personal ability, such as new media literacy (NML), and PIU. Chinese university students' PIU has received insufficient scholarly attention, and its relationship with NML is unclear. Therefore, we examined the correlation between PIU and NML in 462 Chinese university students. The results showed that PIU was widespread in varying degrees, and the NML score was 4.23 out of 5. Personal NML was positively correlated with PIU, especially the critical prosuming dimension. Gender influenced neither PIU nor new media literacy. Students' residence was only positively associated with NML, not PIU. Gender and place of residence did not moderate the correlation between NML and PIU, and place of residence also did not moderate the correlation between gender and PIU. These findings provide insight into the relationship between humans and the Internet and have practical implications regarding preventive interventions for emerging adults.

KEYWORDS: Problematic Internet use; critical presuming; new media literacy

1 INTRODUCTION

The Internet has become an infrastructure of people's daily lives, and the time they spend on the Internet is increasing. According to Digital 2022: April Global Statshot Report (Datareportal, 2022), the typical Internet user spends more than 40 percent of their waking life online. We now live in a permanently online/permanently connected (POPC) world. Activities which entail excessive time online generate excessive, compulsive, or addictive internet use, which may lead to undesired consequences such as depression, anxiety, stress, loneliness, family problems, and even Internet addiction (Elhai et al., 2017; Wallace, 2014; Kim et al., 2009). As a public health concern, PIU has been mentioned by the World Organization. Moreover, preventing and mitigating PIU-associated health risks and disorders was considered a long-term goal at a WHO meeting in 2014 (World Health Organization, 2015).

Preventive intervention can reduce PIU. Predictors of PIU come from three groups—individual factors, contextual factors, and developmental factors. Among them, individual factors are the most studied field (Anderson et al., 2017). Individual variables can be classified into objective characteristics of individuals (Baloğlu et al., 2018; de Vries et al., 2018; Tran et al., 2017; Chen et al., 2015; Hong et al., 2014; Thorsteinsson & Davey 2014), individual traits (Stavropoulos et al., 2017; Yu et al., 2015; Hong et al., 2014; Gámez-Guadix et al., 2013; Haagsma et al., 2013). In addition, as the clinical aspects of PIU resemble the addiction phenomenon, scholars have also referred to addiction research and explored psychological characteristics (Mamun et al., 2020; Chou et al., 2017; Younes et al., 2016; Fernández-Villa et al., 2015). Although existing research has been fruitful, most of the variables analyzed are objective static (i.e., not-changeable, predisposing factor) variables that individuals cannot change (such as age and gender).

Even though some psychopathological factors are dynamic-changeable, the relationship between variables and PIU may also be bidirectional, for example, mental health (Anderson et al., 2017). As Internet users, individuals are often in the affected position and lack subjectivity in research. In addition, the existing studies emphasize personal attributes and the relationship between personal ability (such as media literacy). At the same time, there needs to be more exploration of PIU. Personal ability is a dynamic indicator that individuals spontaneously and purposefully cultivate. Existing research has indicated that people with information literacy are less likely to encounter network risks (Leung & Lee, 2012a). Therefore, how their PIU is influenced by personal ability traits, especially media literacy, information literacy, and new media literacy related to media use, warrants further scholarly inquiry.

Research has indicated that there is an inverse relationship between age and Problematic Internet use (PIU) (Heo et al., 2014, de Vries et al., 2018; Tran et al., 2017). As digital natives, adolescents and emerging adults (18-29 years) use the Internet more frequently, and longer, than other age groups. Therefore, they are at a greater risk of PIU. Among those who suffer from them, emerging adults are the group that deserves more attention. The foremost reason is that Internet addiction prevalence among emerging adults has increased significantly over the last two decades (Dalal & Basu, 2016; Griffiths et al., 2016). The PIU prevalence rate among university students has reached 47.7% (Mengistu et al., 2021). Moreover, many countries have used prevention programs or laws and regulations in an attempt to intervene and prevent PIU. Yet the existing prevention programs are concentrated in primary and secondary schools (Bağatarhan & Siyez, 2022; Neverkovich et al., 2018; Yang & Kim, 2018); most laws and regulations target teenagers. For example, China has issued laws and regulations such as the Law of the People's Republic of China on the Protection of Minors (2020 Revision). The

aim of this policy is to prevent minors from becoming addicted to online games, however it lacks effective external supervision means for emerging adults over 18 years of age. Furthermore, PIU can have a destructive effect on academic performance (Langarizadeh et al., 2018). Therefore, there is a need for further in-depth research on PIU among college students.

Over the past two decades, China has been home to some of the world's fastest Internet proliferation. According to a series of reports from the China Internet Network Information Center (CNNIC), the population of Chinese internet users increased from 0.62 million in 1997 to 1.03 billion in December 2021. The proliferation of the Internet also makes Chinese college students a high-risk group for PIU. The college student group is a typical representative of emerging adults. 28.27% of college students spend at least 6 hours online every day, and more than 80% of college students say that they would feel at a loss, or even a certain degree of anxiety in situations when they had no internet access (Zhao & Wu, 2021). Moreover, China has the world's largest population of university students (291 million). Therefore, understanding the PIU status of Chinese university students and how its influencing factors may be representative of the world can provide a forward-looking reference for other countries.

The aim of this study is to explore whether media literacy education can mitigate problematic Internet use, and to determine whether serious problems in the future can be prevented. Therefore, we address three research questions in this study:

Q1: What is the status of PIU among Chinese university students?

Q2: What is the current level of NML among Chinese university students?

Q3: What is the relationship between NML and PIU?

2 LITEARTURE REVIEW

2.1 Defining problematic internet use (PIU)

In previous studies, researchers have referred to maladaptive Internet use as Internet addiction disorder (IAD), computational Internet use, or computer addiction (Young et al., 1999). Although the clinical manifestations of some cases of PIU are similar to those of addiction, the contention that it is a form of addictive behavior is controversial (D'Hondt et al., 2015; Starcevic, 2013). There are three main views of opponents: first, the basis of addictive behavior lies in stimulation and refers to a physical or psychological dependence on some stimuli (Davis, 2001). This is often from a chemical substance, such as alcohol, caffeine, or nicotine. However, the problematic use of the Internet is not caused by a particular chemical substance. Moreover, addiction is based on a medical model, not a behavioral pattern. In other words, PIU covers a broader range of behaviors than addiction (Leung & LEE, 2012a). Furthermore, the criteria for addiction are murky. The existing standards are all borrowed from clinical standards for addiction, such as gambling addictions. These standards adopt confirmatory approvals, but do not distinguish between a broad spectrum of behaviors, and thus there is the risk of over pathology. For example, there is no clear distinction between high involvement and dysfunctional involvement (Billieux et al., 2015). As an alternative, the term problematic internet use (PIU) has been suggested to describe a maladaptive pattern of internet use (D'Hondt et al., 2015). PIU can be divided into specific and generalized behavior (Davis et al., 2002). Specific PIU refers to

behavior focused on a particular online activity or application. Generalized PIU focuses on a more pervasive compulsion to be online and communicate with others (Davis, 2001). Since the aim of our study is to explore the more representative and actual state of Chinese college students' Internet use, we do not focus on addictive behavior. Instead, our research object is generalized PIU.

In this study, the operational definition of PIU will be based on Davis' definition (Davis et al., 2002). PIU has four dimensions: loneliness/depression, diminished impulse control, distraction, and social comfort. The loneliness/depression dimension involves feelings of worthlessness and depressive cognition related to the Internet. The diminished impulse control dimension involves obsessive cognitions about the Internet, and the inability to curb Internet use despite the desire to do so. Distraction can be conceptualized as using the Internet as an avoidance-oriented form of coping with negative implications for personal adjustment. The social comfort dimension indicates the extent to which individuals use the Internet as a social tool and derive feelings of safety and security from it.

2.2 Defining new media literacy (NML)

NML is a convergence of all forms of literacy developed over the centuries, and a survival kit for the Internet era. It focuses not only on the same skills as media literacy such as accessing, understanding, analyzing, evaluating, and producing media content, both written and electronic (Hobbs & Jensen, 2009; Zhang, Zhu, & Sang, 2014), but on collective creation, social interaction, active participation, and engagement (Jenkins, 2006; Maloney, 2007).

Combining Toffler's (1981) concept of the prosumer with Buckingham's (2003) notion of functional and critical literacy, Chen et al. (2011) proposed a theoretical model for NML. According to this theoretical framework, NML can be identified as two continua: from consuming to prosuming literacy, and from functional to critical literacy. NML can be regarded as four components: (a) functional consuming, (b) critical consuming, (c) functional prosuming, and (d) critical prosuming (Koc & Barut, 2016). Functional consuming refers to the ability to access and understand media content at the textual level. Critical consuming is the ability to critically understand media messages and their contexts, such as social, economic, political, and cultural consequences. Functional presuming is the ability to create media content and participate in various new media spaces. Critical presuming is the ability to utilize media content in a productive way to convey one's own beliefs and values, and to consider expected effects during media construction and participation (Koc & Barut, 2016; Chen et al., 2011).

2.3 New media literacy and Problematic Internet Use

Unlike demographic characteristics and individual traits, new media literacy is a skill humans acquire which can be improved through media literacy education. Existing research has yielded divergent opinions regarding the relationship between NML and PIU. Most indicated a negative relationship between individual media literacy and PIU (Langarizadeh et al., 2018; Stodt et al., 2016; Wegmann et al., 2015). There are two common explanations. First, improving media literature can improve information search efficiency and reduce time spent on the Internet (Leung & Lee, 2012b), thus lowering the risk of PIU. Another explanation is that individuals with

low new media literacy are often in subconscious states when using the Internet, and in this case, it is easier to engage in problematic Internet use (Durak & Saritepeci, 2019). In sum, teenagers' network deviant behavior is related to their lack of media literacy and skills. According to the Message Interpretation Process Model, children and adolescents progress through a series of logic- and affect-based decision-making steps as they interpret media messages (Austin & Knaus, 2000). Media literacy curricula target adolescents' logic-based decision-making mechanisms to strengthen their critical thinking skills (Pinkleton et al., 2012). Therefore, media literacy education is a potential solution for PIU (Xiong, 2019; Wang, 2015).

However, conflicting results have also been reported, indicating that media literacy has a positive correlation with PIU (Arslantas, Yaylacı, & Özkaya, 2023; Yu et al., 2018; Blinka et al., 2015). The popular explanation is that adolescents with higher media literacy spend more time online, which hone these skills. In turn, they may be more susceptible to PIU. The COVID-19 pandemic and stay-at-home orders have exerted a substantial influence on students' utilization of the Internet, as they progressively depend on online resources (Masaeli & Farhadi, 2021). In addition, there may not be a significant relationship between NML and PIU (Durak & Saritepeci, 2019). However, some studies have shown that as a multi-dimensional construct, some parts of media literacy are suitable for predicting the risk of PIU, while others are not (Wegmann et al., 2015). As such, some dimensions have no significant relationship with PIU (Leung & Lee, 2012a). In this vein, we posit a hypothesis:

H1: NML is negatively correlated with PIU.

In sum, research results on the relationship between NML and PIU have been mixed and sometimes contradictory. These results suggest that the relationship between the two may be more complex than previously thought. Since the definition adopted in this study contains multiple dimensions, the relationship between the dimensions of variables should be one of the research concerns.

2.4 Gender with Problematic Internet Use and New Media Literacy

Gender is one of the most frequently researched variables in studies of PIU. Yet the relation between gender and PIU is controversial. Some studies, including meta-analytic studies, cross-sectional and longitudinal investigation studies, indicate that males have higher levels of PIU symptoms, PIU severity, and Internet use than females (Su et al., 2019; Tomaszek K., & Muchacka-Cymerman, 2019; Li et al., 2019). The reason ismales have more difficulty restraining their excessive behaviors, and are more susceptible to addiction to reward mechanisms (Xin et al., 2018). However, recent research in samples from many countries has indicated that there is no significant gender difference in PIU severity, as is the case in China (Li et al., 2019), Japan (Tateno et al., 2019), Portugal (Costa et al., 2019), Slovakia (Faltýnková et al., 2020) and Egypt (Arafa et al., 2019). Moreover, studies have shown a third relationship between gender and PIU, that is, females outscore males in PIU levels (Casaló & Escario, 2019; Machimbarrena et al., 2019; Karaer & Akdemir, 2019). The popular explanation is that males are more susceptible to the generalized PIU, while females are at higher risk of the specific PIU, including maladaptive use of social media platforms and excessive smartphone use.

In addition to PIU, gender is another important variable for NML. The relationship between gender and NML is more complex. Some studies have indicated that there is no significant difference between males' and females' new media literacy skills (Li, 2022; Ata & Yildirim, 2020; Zhong et al., 2016). Others have revealed that boys outperform girls, suggesting that females feel more challenged by technology-related issues (Jenson & Droumeva, 2017; Arsenijević & Andevski, 2016). Furthermore, gender can exert a multivariate effect on NML—men excel in some competencies of NML, while women are better at others (Literat, 2014), and this can be explained by gender determining the structure of media literacy.

In addition to the gender differences in PIU levels, some studies have investigated the moderating effect of gender among several variations and online behaviors. Research results from Taiwan, Iran, and Indonesia have indicated that gender can moderate the relationships between motor impulsivity, communication patterns, self-esteem, and PIU (Wahyuni & Maksum, 2020; Chen, Lo, & Lin, 2017; Tajalli, & Zarnaghash, 2017). In a French sample, Verseillié et al. (2020) found a statistically significant correlation between users' eccentric personalities and problematic Twitter use (PTU) only in women. Moreover, the correlation between users' dramatic personalities and PTU was lower in men than in women.

As generalized PIU is the focus of this study, and the research results on the relationship between gender and NML are the same as those of PIU, so we propose the next hypotheses:

H2: Males score higher on PIU than females.

H3: Males outperform females in NML.

H4: Gender moderates NML's effect on PIU.

2.5 Place of Residence with Problematic Internet Use and New Media Literacy

Place of residence is another controversial variable of PIU and NML. It is generally acknowledged that the Internet infrastructure and education levels in urban areas are superior to those in rural areas. As such, the Internet is easier to access in urban areas, and urban dwellers score higher on NML (Kim, Kil, & Shin, 2014; Liao, & Chang, 2010). Yet, this may lead to high incidence of problems such as excessive Internet use (e.g. Yu et al., 2018; Taha et al., 2016). However, some scholars hold different opinions on this, as several studies have indicated that place of residence does not lead to a statistically significant difference in NML (Arsenijević, & Andevski, 2016; Miočić, & Perinić, 2014) or PIU (Joseph, 2020; Hamza et al., 2019). Kożybska et al. (2019) even found that compared to city residents, residents of rural areas have significantly higher PIU scores. In addition to place of residence's direct effect on NML and PIU, studies have also shown that it can moderate other variables' effects on PIU. Yu et al. (2018) point out that students' geographic origins can moderate the relationship between gender and PIU, but the effect is not evident between information and communication technology literacy (ICTL). This leads to the final four hypotheses:

H5: Students from urban areas score higher on NML than rural students.

H6: PIU severity among urban students is higher than among rural students.

H7: Place of residence moderates the relationship between gender and PIU.

H8: Place of residence moderates NML's effect on PIU.

3   METHODS

The subjects of this study are higher education students in China (those pursuing associate's, bachelor's, master's, or Ph.D. courses) and who are willing to participate in the study. In March 2021, through convenience sampling and snowballing, our data were collected anonymously on popular social media platforms such as WeChat, Weibo, QQ, Zhihu, and Douban. After excluding incomplete samples, there was a total of 462 valid samples, with an effective questionnaire recovery rate of 92.4%. The original questionnaire was in simplified Chinese and was translated into English before analysis.

3.1   Measures

3.1.1. Problematical Internet Use (PIU)
Adapted from the Davis Online Cognition Scale (DOCS) (Davis et al., 2002), twelve items were used to assess PIU. The DOCS contains four subscales: loneliness/depression, diminished impulse control, social comfort, and distraction. In this study, each subscale has three items. Respondents answer on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) (M = 3.89, SD = 0.68, α= 0.87). Higher scores represent higher levels of PIU.

3.1.2. New Media Literacy (NML)
We assessed NML with the New Media Literacy Scale (NMLS) for university students, developed by Koc and Barut (2016). Fourteen items were selected from the original thirty-five items. Based on the pre-test results, some items were deleted or merged with others. The respondents were asked to indicate their extent of agreement via a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) (M = 4.23, SD = 0.53, α= 0.887).The higher the score, the higher the individual's new media literacy.

3.1.3. Demographic information
Respondents' demographic information was collected, including gender (41.60% female) and place of residence (74.90% urban).

3.2   Analytical design

The study was designed within the relational research model in which the relationships between NML and PIU were examined. Within this context, descriptive statistics for all variables were computed. Bivariate correlations across all variables, including all dimensions of NML and PIU, were examined by Spearman's correlational analysis, whereas the relationship between two categorical variables (place of residence and gender) was tested by Cramer's V correlational analysis. A student's t-test was used to assess the relationship between gender, place of residence and PIU and NML levels. Simple and multiple linear regression analysis was used to analyze whether NML and its four dimensions were related to PIU. A Student's t-test was used to analyze whether gender and place of residence could lead to a statistically significant difference in NML. Hierarchical regression was conducted to address H4, H7, and H8, and PROCESS macro model 1 was applied for the moderation effect.

4   RESULTS

4.1   The relationship between NML and PIU

H1 posits that NML is negatively correlated with PIU. As shown in Table 1, there are significant, positive correlations between NML (b =0.51, SE = 0.06, $p < 0.01$) , NML-FC, NML-CC, NML-FP, NML CP, and PIU, with generally moderate r values. Thus, H1 is rejected. When accounting for specific dimensions, NML had highest positive correlation ($r = 0.59$) with PIU-SC.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	1.00											
2. Place of residence	-0.002	1.00										
3. NML	-.008	-0.14**	1.00									
4. NML-FC	0.10*	-0.10*	0.73**	1.00								
5. NML-CC	0.02	-0.11*	0.83**	0.67**	1.00							
6. NML-FP	0.06	-0.09	0.84**	0.60**	0.68**	1.00						
7. NML-CP	-0.06	-0.14**	0.84**	0.45**	0.51**	0.60**	1.00					
8. PIU	-0.06	-0.05	0.51**	0.32**	0.36**	0.39**	0.57**	1.00				
9. PIU-SC	-0.06	-0.005	0.59**	0.40**	0.48**	0.48**	0.57**	0.76**	1.00			
10. PIU-LD	0.07	-0.09	0.40**	0.36**	0.36**	0.34**	0.35**	0.70**	0.46**	1.00		
11. PIU-DIC	0.01	0.02	0.37**	0.28**	0.27**	0.31**	0.40**	0.81**	0.50**	0.64**	1.00	

12. PIU-D	-0.12**	-0.06	0.33**	0.14**	0.18**	0.21**	0.43**	0.80**	0.49**	0.34**	0.51**	1.00

Note. **$p < 0.01$, *$p < 0.05$

Table 1. Bivariate correlation coefficients across all endogenous variables.

Simple linear regression and multiple linear regression were separately used to investigate the effects of NML (Model 1) and its four dimensions (Model 2) on PIU. The two models explained 16.0 and 19.8 percent of the total variance, respectively, and the results are presented in Table 2. No multicollinearity problems were detected in Model 2, since VIF values ranged from 1.69 to 2.29. NML and NML-CP had significant positive correlations with PIU. It is worth noting that in Table 1, the four dimensions of NML had significant correlations with PIU. However, when inputting the four into one multiple regression, NML-CP became the only significant influencing variable, and its influence was significantly higher than the other three.

	Problematic Internet Use					
	b	*SE*	β	*t*	*p*	VIF
Model 1						
(constant)	1.72	0.23		7.37***	0.00	
NML	0.51	0.06	0.40	9.36***	0.00	1.00
Model 2						
(constant)	2.03	0.25		8.28***	0.00	
NML-FC	0.07	0.07	0.06	1.02	0.31	1.93
NML-CC	0.03	0.07	0.03	0.46	0.64	2.17
NML-FP	0.003	0.07	0.003	0.05	0.96	2.29
NML-CP	0.35	0.05	0.40	7.47***	0.00	1.63

Note. ***$p < 0.001$
Model 1: R = 0.40, R2 = 0.16, $p < 0.01$, F（1，461）=85.58
Model 2: R = 0.45, R2 = 0.20, $p < 0.01$, F（4，461）=28.23

Table 2 Multiple regression results examining NML and its four dimensions with PIU

Then we tested the regression relationship between NML and NML-CP and the four dimensions of PIU. As shown in Table 3, NML and NML-CP had significant effects on PIU-SC, PIU-LD, PIU-DIC, and PID-D, with a generally small R^2 (0.05to 0.11), except for on PIU-SC. The regression R^2 for NML and NML-CP on PIU-SC were 0.23 and 0.25, respectively. NML's effect on PIU may be a reflection NML-CP's effect on PIU-SC.

	b	*SE*	β	*t*	*p*	R^2	$F_{(1, 461)}$
NML – PIU-SC							
(constant)	0.58	0.29		2.01	0.045		
NML	0.79	0.07	0.48	11.66	0.00	0.23	135.83
NML – PIU-LD							
(constant)	2.30	0.28		8.21	0.00		
NML	0.43	0.07	0.29	6.49	0.00	0.08	42.07
NML – PIU-DIC							
(constant)	2.25	0.30		7.64	0.00		
NML	0.41	0.07	0.27	5.94	0.00	0.07	35.32
NML – PIU-D							
(constant)	1.76	0.38		4.66	0.00		
NML	0.42	0.09	0.22	4.79	0.00	0.05	22.99
NML-CP – PIU-SC							
(constant)	1.67	0.18		9.11	0.00		
NML-CP	0.56	0.05	0.50	12.46	0.00	0.25	155.25
NML-CP – PIU-LD							
(constant)	3.17	0.18		17.24	0.00		
NML-CP	0.23	0.05	0.23	5.16	0.00	0.06	26.62
NML-CP – PIU-DIC							
(constant)	2.84	0.19		14.96	0.00		
NML-CP	0.29	0.05	0.28	6.14	0.00	0.08	37.68
NML-CP – PIU-D							
(constant)	1.79	0.24		7.59	0.00		
NML-CP	0.44	0.06	0.34	7.65	0.00	0.11	58.58

Table 3 Simple regression results examining NML and NML-CP with four dimensions of PIU

4.2 Gender's effect on NML and PIU

H2 and H3 suggest that males would score higher than females on PIU and NML. As Table 1 shows, gender is correlated with neither

NML nor PIU, but it does have a significant correlation with NML-FC ($r = 0.10$) and PIU-D ($r = -0.12$). An independent samples t-test was used to investigate whether there was a statistical difference between males and females for NML, PIU, and their dimensions. As shown in Table 4, gender was not a predictor variable for either PIU or NML. Thus, H2 and H3 are supported. Males score higher on NML-FC, and have less severity in PIU-D.

	Male (N = 270)	Female (N = 192)	t	p
	Mean (SD)	Mean (SD)		
NML	4.23 (0.51)	4.23 (0.55)	0.07	0.95
NML-FC	4.36 (0.57)	4.47 (0.54)	-1.99*	0.05
NML-CC	4.30 (0.57)	4.31 (0.60)	-0.19	0.85
NML-FP	4.24 (0.63)	4.29 (0.66)	-0.81	0.42
NML-CP	4.05 (0.70)	3.91 (0.88)	1.80	0.07
PIU	3.91 (0.69)	3.85 (0.66)	0.96	0.34
PIU-SC	3.98 (0.80)	3.83 (0.98)	1.81	0.07
PIU-LD	4.06 (0.78)	4.15 (0.78)	-1.21	0.23
PIU-DIC	3.97 (0.83)	4.00 (0.80)	-0.38	0.70
PIU-D	3.64 (1.04)	3.43 (1.01)	2.17*	0.03

Note. *p < 0.05

Table 4. Results of t-test examining the gender difference effect on NML and PIU

H4 suggests that gender moderates the correlation between NML and PIU. The results of the PROCESS macro Model 1 demonstrate that gender is not a significant moderator between NML and PIU ($b = 0.13$, $SE = 0.11$, $p = 0.25 > 0.05$). Hence, H4 is rejected.

4.3 The effect of place of residence on NML and PIU

H5 and H6 suggest that urban students score higher in NML and PIU than rural students. As Table 1 shows, place of residence has no correlation with PIU or its dimensions, but does have a significant correlation with NML and its dimensions, except for NML-FP. An independent samples t-test was conducted to explore whether there were significant differences between urban students and rural students on NML, PIU, and their dimensions. Table 5 shows that urban students scored significantly higher in NML ($t = 2.91$, $p < 0.01$), NML-CC ($t = 2.42$, $p < 0.05$), NML-FP ($t = 2.11$, $p < 0.05$), NML-CP ($t = 2.91$, $p < 0.01$), and PIU-LD ($t = 2.04$, $p < 0.05$). Thus, H5 is fully supported, and H6 is partly supported.

	Urban (N = 346)	Rural (N = 116)	t	p
	Mean (SD)	Mean (SD)		
NML	4.27 (0.52)	4.10 (0.55)	2.91**	0.004
NML-FC	4.43 (0.56)	4.33 (0.54)	1.64	0.10
NML-CC	4.34 (0.57)	4.19 (0.61)	2.42*	0.02*
NML-FP	4.30 (0.63)	4.15 (0.69)	2.11*	0.04
NML-CP	4.06 (0.77)	3.81 (0.81)	2.91**	0.004
PIU	3.91 (0.67)	3.82 (0.70)	1.17	0.25
PIU-SC	3.92 (0.87)	3.90 (0.91)	0.29	0.77
PIU-LD	4.14 (0.75)	3.97 (0.85)	2.04*	0.04
PIU-DIC	3.98 (0.79)	3.98 (0.88)	0.04	0.97
PIU-D	3.59 (1.03)	3.45 (1.04)	1.25	0.21

Note. **p < 0.01, *p < 0.05

Table 5. Results of t-test examining place of residence's effect on NML and PIU

H7 suggests that place of residence moderates the correlation between gender and PIU. The results of PROCESS macro Model 1 show that the interaction between gender and place of residence is insignificant ($b = 0.19$, $SE = 0.15$, $p = 0.21 > 0.05$). Thus, H7 is rejected.

H8 suggests that the moderating effect of place of residence between NML and PIU is significant. The results of PROCESS macro Model 1 indicated that the interaction between NML and place of residence was not significant ($b = -0.20$, $SE = 0.12$, $p = 0.11 > 0.05$). Thus, H8 is also rejected.

5 DISCUSSION

Heeding the call to reduce PIU-associated health risk and disorders, we investigated the relationship between PIU and NML and demographic characteristics such as gender and place of residence among Chinese university students. Several findings warrant in-depth discussion.

First, our results are consistent with prior literature which has indicated that there is wide variation in college students' PIU levels (e.g., Balhara et al., 2019; Mamun et al., 2019; Islam & Hossin, 2016; Błachnio et al., 2015). The total PIU score and the average value of each dimension are greater than 3.5. These results can be explained from both macro (environmental) and micro (individual) perspectives. In terms of the macro environment, the Internet has evolved into an essential component of modern life. Free or cheap Internet access on university campuses, and internet capabilities in portable devices such as smartphones and tablets have become the infrastructure in the life of today's college students. The emerging adults, including university students, grow up with this technology, and remaining online is their normal status (Vorderer

et al., 2016). This has become a major contributor to excessive Internet use. From the individual perspective, college-aged young adults need to use the Internet to establish their social relations and obtain various resources related to learning (Ozkan & Solmaz, 2015). At the same time, the lack of strict parental supervision also leads to PIU (Onyekachi et al., 2022; Zhang et al., 2015).

Second, college students' NML levels are generally high, and this finding is similar to the findings of previous studies (Chin & Zanuddin, 2019; Koc & Barut, 2016). However, it contradicts findings from Syam and Nurrahmi (2020), who found a low degree of media literacy among Indonesian university students. This difference could be partially explained by the fact that our research object is a generalized NML, while Syam and Nurrahmi's research focused on media literacy in the unique situation in which there is fake news communication in the context of social media. For the four dimensions of NML, the critical prosuming score is significantly lower than other dimensions. This is consistent with Chen et al's. (2018) results. Scholars have pointed out that although young people often have adequate functional literacy, they lack critical literacy skills (Livingstone et al., 2019). Based on the definition of critical prosuming, it is not difficult to see that it requires the highest Internet use aptitude. Critical prosuming literacy focuses on the ability to critically understand the media content of embedded sociocultural values and ideological issues, and interact and create media content in new media environments (Huang et al., 2012). Therefore, it cannot be improved simply by increasing the media contact time or content contact quantity.

Third, our results show that NML and NML-CP are predictors of PIU severity. These results contradict the findings of a previous study which showed that non-vulnerable children with high literacy levels had the least risk of excessive Internet use (Helsper & Smahel, 2020). The relationship between NML and PIU is complex, and as shown above, there is no scholarly consensus on the relationship between the two. Media literacy has been considered a critical concept since it was first proposed. It is regarded as the media audience's ability to interpret and criticize various media information and use media information for personal and social development (Yang & Zhang, 2015). NML education entails special attention to the cultivation of criticism, and it has been demonstrated that NML may shield individuals from the negative influences of misinformation (Xiao et al., 2021). However in the present study, NML showed no protective role for college students against PIU.

There are two possible reasons for this. Firstly, NML and its dimensions are used to measure Internet users' ability to access, analyze, evaluate, and create media content. The higher scores in NML and its dimensions mean that Internet users possess more knowledge and greater abilities. But having this knowledge and these abilities does not necessarily mean that one can make the right choice or action when meeting media content in practice (Jones-Jang, Mortensen, & Liu, 2021; Syam & Nurrahmi, 2020). This indicates that NML may only represent a single facet of ability or a behavior tendency, while PIU is the specific embodiment of behavior. There may also be other influencing factors or intermediary links between the two, which need further exploration in future research. Second, a high NML score means that individuals have more control and network influence, and this will have a positive effect on their self-efficacy (Scull et al., 2018; Jeong, Cho, & Hwang, 2012). This would encourage these individuals to stay on the Internet for longer durations. However, several studies have shown that although high NML groups can

critically select platforms and media content, they are averse to content sharing (Vraga & Tully, 2019). Therefore, we can understand people's mentality and behavior using the Internet through qualitative methods such as focus groups or in-depth interviews. In this way, we can explore the relationship between NML and PIU and variables including self-effectiveness.

Third, gender has been considered one of the factors affecting users' Internet useability in previous studies. However, as shown above, scholars still have different views on gender's effect on NML and PIU. This study shows that gender is associated with neither NML nor PIU. There are three possible reasons why there is no significant difference between men and women. First, as early as 2001, the Ministry of Education of China planned to use 5-10 years to popularize information technology education in primary and secondary schools across the country. The research object of this paper is Chinese college students, who have completed primary and secondary education, and therefore have specific information technology capabilities. Second, China began to implement the family planning policy in the 1980s, which gave male and female college students similar social expectations and competitive pressure since most families had only one child（Chen, 2017). The third reason is that this study discusses generalized PIU, not user behavior, in specific situations. Therefore, there will be no difference due to gender preference. It is worth noting that although there is no significant difference between men and women in NML, girls' disadvantage in NML may also increase over time (Gnambs, 2021). Based on the above reasons, it can also be speculated that the gender effect on NML and PIU may be affected by socio-cultural roles and socio-economic and educational development levels. This could be further explored in future research.

Fourth, students' place of residence is another factor to explore. The results of this study show that the differences between urban and rural areas are only in NML, NML-CC, NML-FP, NML-CP, and PIU-LD. There are significant differences between urban and rural students in NML, but there is no difference in the NML-FC dimension, while the difference in PIU is miniscule. This is because NML-FC is a measure of users' Internet access capabilities, that is, whether they can access the Internet and consume Internet media content. However, more research is needed about the access gap between urban and rural areas. According to the Ministry of Industry and Information Technology of China, as of November 2021, the existing administrative villages in China have realized "broadband access to all villages". CNNIC data also shows that as of December 2021, the Internet penetration rate in China had reached 73%. Moreover, the access and use channels between urban and rural areas have been leveled by the popularization of the Internet. However, for the other three dimensions of NML, media literacy education needs improvement. However, media literacy education has not been popularized in China. Currently, it is concentrated in large and medium-sized cities, creating a knowledge gap between urban and rural areas. However, as students begin university to study in the same network environment and social living environment, the network use behavior will gradually converge, the knowledge gap will dissipate, and the difference in student origin will no longer have a significant effect on PIU behavior.

Finally, the hypothesis about the regulatory effect in this study has not been confirmed. That is, gender and birthplace do not moderate NML's effect on PIU. This is also consistent with other results of this study; that is, the effects of gender and student origin on NML and PIU may be confounded by other factors or "failure" in a

specific socio-cultural context. This should also be noted in future research.

6 CONCLUSION

For Chinese college students, NML is already high and there is a significant correlation with PIU. However, the problem of coping with the different degrees of PIU that have emerged cannot be solved simply by relying on media literacy education to improve NML. It is also necessary to further explore the relationship between NML and the PIU dimension in future research, as well as other factors' effects on their relationship. In this way, we can propose more effective media literacy education programs to help college students use the Internet in a more healthy way.

This study is not without limitations. First, its focus is generalized Internet use. Therefore, we did not investigate individuals' purposes, which has been considered an explanatory factor of NML (Durak & Saritepeci, 2019). Future research could further explore the interaction effect between Internet use purposes and specific PIU and NML. Second, this study relies entirely on a questionnaire. This means that all of the results are derived from self-reporting. Thus, they are subjective, and can only explain the NML and PIU levels of the research object, not the reasons behind them. Therefore, qualitative research methods, such as in-depth interviews and focus groups, could be introduced in future research to explore the influencing factors from awareness to behavior. Third, our study is cross-sectional. Therefore, we could not make any causal inference. However, our findings can serve as a premise for future new media literacy curricula, which could be an effective strategy for improving PIU. Future scholars should endeavor to use panel data to gauge changes over time.

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REFERENCES

Anderson, E. L., Steen, E., & Stavropoulos, V. (2017). Internet use and problematic Internet use: A systematic review of longitudinal research trends in adolescence and emergent adulthood. International Journal of Adolescence and Youth, 22(4), 430–454. https://doi.org/10.1080/02673843.2016.1227716

Arafa, A., Mahmoud, O., & Abu Salem, E. (2019). Excessive internet use and self-esteem among internet users in Egypt. International Journal of Mental Health, 48(2), 95-105. http://dx.doi.org/10.1080/00207411.2019.1611167.

Arsenijević, J., & Andevski, M. (2016). New media literacy within the context of socio-demographic characteristics. Procedia Technology, 22, 1142-1151. https://doi.org/10.1016/j.protcy.2016.01.161.

Arslantas, T. K., Yaylacı, M. E., & Özkaya, M. (2023). Association between digital literacy, internet addiction, and cyberloafing among higher education students: A structural equation modeling. E-Learning and Digital Media, 0(0). https://doi.org/10.1177/20427530231156180

Ata, R., & Yildirim, K. (2020). Analysis of the relation between computational thinking and new media literacy skills of first-year engineering students. Journal of Educational Multimedia and Hypermedia, 29(1), 5-20.

Austin, E. W., & Knaus, C. (2000). Predicting the potential for risky behavior among those "too young" to drink as the result of appealing advertising. Journal of Health Communication, 5, 13–27.

Austin, E. W. (2007). The message interpretation process model. Encyclopedia of children, adolescents, and the media, 2, 535-536.

Austin, E. W., Pinkleton, B. E., Chen, Y. C., & Austin, B. W. (2015). Processing of sexual media messages improves due to media literacy effects on perceived message desirability. Mass Communication and Society, 18(4), 399-421. https://doi.org/10.1080/15205436.2014.1001909

Aviv Weinstein & Michel Lejoyeux (2010) Internet Addiction or Excessive Internet Use, The American Journal of Drug and Alcohol Abuse, 36:5, 277-283. https://doi.org/10.3109/00952990.2010.491880.

Bağatarhan, T., & Siyez, D. M. (2022). The Effectiveness of a Cognitive-Behavioral Prevention Program for Internet Addiction. Journal of Rational-Emotive & Cognitive-Behavior Therapy, 1-26.

Balhara, Y. P. S., Doric, A., Stevanovic, D., Knez, R., Singh, S., Chowdhury, M. R. R., ... & Le, H. L. T. C. H. (2019). Correlates of Problematic Internet Use among college and university students in eight countries: An international cross-sectional study. Asian Journal of Psychiatry, 45, 113-120. https://doi.org/10.1016/j.ajp.2019.09.004

Baloğlu, M., Kozan, H. İ. Ö., & Kesici, Ş. (2018). Gender differences in and the relationships between social anxiety and problematic internet use: Canonical analysis. Journal of medical Internet research, 20(1), e33. https://doi.org/10.2196/jmir.8947

Bayraktar F, Gu¨n Z (2006). Incidence and correlates of Internet usage among adolescents in North Cyprus. CyberPsychology & Behavior, 10, 191–197. https://doi.org/10.1002/ijop.12231.

Billieux, J., Schimmenti, A., Khazaal, Y., Maurage, P., & Heeren, A. (2015). Are we over pathologizing everyday life? A tenable blueprint for behavioral addiction research. Journal of Behavioral Addictions, 4(3), 119–123. https://doi.org/10.1556/2006.4.2015.009

Błachnio, A., Przepiórka, A., & Hawi, N. S. (2015). Exploring the online cognition scale in a Polish sample. Computers in Human Behavior, 51, 470-475. https://doi.org/10.1016/j.chb.2015.05.028.

Blinka, L., Škařupová, K., Ševčíková, A., Wölfling, K., Müller, K. W., & Dreier, M. (2015). Excessive internet use in European adolescents: What determines differences in severity? International journal of public health, 60(2), 249-256.

Buckingham, D. (2003). Media education: Literacy, learning and contemporary culture. Cambridge, UK: Polity Press.

Casaló, L. V., & Escario, J. J. (2019). Predictors of excessive internet use among adolescents in Spain: The relevance of the relationship between parents and their children. Computers in Human Behavior, 92, 344-351. http://dx.doi.org/10.1016/j.chb.2018.11.042.

Chen, D. T., Wu, J., & Wang, Y. M. (2011). Unpacking new media literacy. Journal on Systemics, Cybernetics and Informatics, 9 (2). 84-88. http://www.iiisci.org/journal/sci/FullText.asp?var=&id=OL508KR

Chen, D. T., Lin, T. B., Li, J. Y., & Lee, L. (2018). Establishing the norm of new media literacy of Singaporean students: Implications to policy and pedagogy. Computers & Education, 124, 1-13. https://doi.org/10.1016/j.compedu.2018.04.010.

Chen, X. P.(2017). College Students' Internet Media Literacy: Preliminary Establishment of Scale and Characteristics Analysis. China Journal of Health Psychology, 25(4), 572-576.

Chen, Y. L., Chen, S. H., & Gau, S. F. S. (2015). ADHD and autistic traits, family function, parenting style, and social adjustment for Internet addiction among children and adolescents in Taiwan: A longitudinal study. Research in Developmental Disabilities, 39, 20–31. https://doi.org/10.1016/j.ridd.2014.12.025

Chen, S. K., Lo, M. T., & Lin, S. S. (2017). Impulsivity as a precedent factor for problematic Internet use: How can we be sure?. International Journal of Psychology, 52(5), 389-397.

Chin, Y. S., & Zanuddin, H. (2019). New media literacy and media use among university students in Malaysia. International Journal of Engineering and Advanced Technology, 8(5C), 469-474.https://doi.org/10.35940/ijeat.E1066.0585C19.

Chou, W. P., Lee, K. H., Ko, C. H., Liu, T. L., Hsiao, R. C., Lin, H. F., & Yen, C. F. (2017). Relationship betweenpsychological inflexibility and experiential avoidance and internet addiction: Mediating effects of mental health problems. Psychiatry Research, 257, 40–44.https://doi.org/10.1016/j.psychres.2017.07.021.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Routledge.

Costa, R. M., Patrão, I., & Machado, M. (2019). Problematic internet use and feelings of loneliness. International journal of psychiatry in clinical practice, 23(2), 160-162. http://dx.doi.org/10.1080/13651501.2018.1539180.

D'Hondt, F., Billieux, J., & Maurage, P. (2015). Electrophysiological correlates of problematic Internet use: Critical review and perspectives for future research. Neuroscience & Biobehavioral Reviews, 59, 64–82. https://doi.org/10.1016/j.neubiorev.2015.10.005.

Dalal, P. K., & Basu, D. (2016). Twenty years of internet addiction Quo Vadis? Indian Journal of Psychiatry, 58(1), 6–11. https://doi.org/10.4103/0019-5545.174354

Datareportal. (2022). Digital 2022: April Global Statshot Report.https://datareportal.com/reports/digital-2022-april-global-statshot.

Davis, R. A. (2001). A cognitive-behavioral model of pathological Internet use. Computers in human behavior, 17(2), 187-195. https://doi.org/10.1016/S0747-5632(00)00041-8

Davis, R. A., Flett, G. L., & Besser, A. (2002). Validation of a new scale for measuring problematic Internet use: Implications for pre-employment screening. Cyberpsychology & behavior, 5(4), 331-345. https://doi.org/10.1089/109493102760275581

de Vries, H. T., Nakamae, T., Fukui, K., Denys, D., & Narumoto, J. (2018). Problematic internet use and psychiatric co-morbidity in a population of Japanese adult psychiatric patients. BMC Psychiatry, 18(1), 1–10. https://doi.org/10.1186/s12888-018-1588-z

Durak, Y. H., & Saritepeci, M. (2019). Modeling the effect of new media literacy levels and social media usage status on problematic internet usage behaviors among high school students. Education and information technologies, 24(4), 2205-2223.

Elhai, J. D., Dvorak, R. D., Levine, J. C., & Hall, B. J. (2017). Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology. Journal of Affective Disorders, 207, 251–259. https://doi.org/10.1016/j.jad.2016.08.030

Faltýnková, A., Blinka, L., Ševčíková, A., & Husarova, D. (2020). The associations between family-related factors and excessive internet use in adolescents. International journal of environmental research and public health, 17(5), 1754. http://dx.doi.org/10.3390/ijerph17051754.

Fernández-Villa, T., Ojeda, J. A., Gómez, A. A., Carral, J., Cancela, M., Delgado-Rodríguez, M., ... & Martín, V. (2015). Problematic Internet Use in University Students: associated factors and differences of gender. Adicciones, 27(4), 265-275.

Gámez-Guadix, M., Orue, I., Smith, P. K., & Calvete, E. (2013). Longitudinal and reciprocal relations of cyberbullying with depression, substance use, and problematic Internet use among adolescents. Journal of Adolescent Health, 53, 446–452. https://doi.org/10.1016/j.jadohealth.2013.03.030

Gnambs, T. (2021). The development of gender differences in information and communication technology (ICT) literacy in middle adolescence. Computers in Human Behavior, 114, 106533. https://doi.org/10.1016/j.chb.2020.106533.

Griffiths, M. D., Kuss, D. J., Billieux, J., & Pontes, H. M. (2016). The evolution of internet addiction: A global perspective. Addictive Behaviors, 53, 193–195.https://doi.org/10.1016/j.addbeh.2015.11.001

Haagsma, M. C., King, D. L., Pieterse, M. E., & Peters, O. (2013). Assessing problematic video gaming using the theory of planned behavior – A longitudinal study of Dutch young people. International Journal of Mental Health Addiction, 11, 172–185. https://doi.org/10.1007/s11469-012-9407-0

Hadlington, L. (2017). Human factors in cybersecurity; examining the link between Internet addiction, impulsivity, attitudes towards cybersecurity, and risky cybersecurity behaviors. Heliyon, 3(7). https://doi.org/10.1016/j.heliyon.2017.e00346.

Hamza, A., Sharma, M. K., Anand, N., Marimuthu, P., Thamilselvan, P., Thakur, P. C., ... & Singh, P. (2019). Urban and rural pattern of Internet use among youth and its association with mood state. Journal of Family Medicine and Primary Care, 8(8), 2602.

Helsper, E. J., & Smahel, D. (2020). Excessive internet use by young Europeans: psychological vulnerability and digital literacy?. Information, communication & society, 23(9), 1255-1273. https://doi.org/10.1080/1369118X.2018.1563203.

Heo, J., Oh, J., Subramanian, S. V., Kim, Y., & Kawachi, I. (2014). Addictive internet use among Korean adolescents: A national survey. PLoS One, 9(2), Article e87819. https://doi.org/10.1371/journal.pone.0087819

Hobbs, R., & Jensen, A. (2009). The past, present, and future of media literacy education. The Journal of Media Literacy Education, 1(1), 1-11. https://doi.org/10.23860/jmle-1-1-1

Hong, S., You, S., Kim, E., & No, U. (2014). A group-based modeling approach to estimating longitudinal trajectories of Korean adolescents' online game time. Personality and Individual Differences, 59, 9–15. https://doi.org/10.1016/j.paid.2013.10.018

Hung, S. C., Yang, S. C., & Luo, Y. F. (2021). New media literacy, health status, anxiety, and preventative behaviors related to COVID-19: A cross-sectional study in Taiwan. International Journal of Environmental Research and Public Health, 18(21), 11247. https://doi.org/10.3390/ijerph182111247.

Islam, M., & Hossin, M. Z. (2016). Prevalence and risk factors of problematic internet use and the associated psychological distress among graduate students of Bangladesh. Asian journal of gambling issues and public health, 6(1), 1-14.

Jenkins, H. (2006). Convergence culture: Where old and new media collide. New York: New York University Press.

Jenson, J., & Droumeva, M. (2017). Revisiting the media generation: Youth media use and computational literacy instruction. E-learning and digital media, 14(4), 212-225. https://doi.org/10.1177/2042753017731357.

Jeong, S. H., Cho, H., & Hwang, Y. (2012). Media Literacy Interventions: A Meta-Analytic Review. Journal of Communication, 62 (3), 454–472. https://doi.org/10.1111/j.1460-2466.2012.01643.x

Jones-Jang, S. M., Mortensen, T., & Liu, J. (2021). Does media literacy help the identification of fake news? Information literacy helps, but other literacies don't. American Behavioral Scientist, 65(2), 371-388. https://doi.org/10.1177/0002764219869406.

Joseph, A. (2020). Predictors of Problematic Internet Use Among Young Adults (Doctoral dissertation, Loyola College of Social Sciences). http://digitallibrary.loyolacollegekerala.edu.in:8080/jspui/bitstream/123456789/2001/1/ANEESHA%20JOSEPH.pdf

Karaer, Y., & Akdemir, D. (2019). Parenting styles, perceived social support and emotion regulation in adolescents with internet addiction. Comprehensive Psychiatry, 92, 22-27. http://dx.doi.org/10.1016/j.comppsych.2019.03.003.

Kim, H. S., Kil, H. J., & Shin, A. (2014). An analysis of variables affecting the ICT literacy level of Korean elementary school students. Computers & Education, 77, 29-38. https://doi.org/10.1016/j.compedu.2014.04.009.

Kim, J., LaRose, R., & Peng, W. (2009). Loneliness as the cause and the effect of problematic Internet use: The relationship between Internet use and psychological well-being. CyberPsychology & Behavior, 12(4), 451–455. https://doi.org/10.1089/cpb.2008.0327

Kim, S., & Noh, D. (2019). The Current Status of Psychological Intervention Research for Internet Addiction and Internet Gaming Disorder. Issues in Mental Health Nursing, 1–7. https://doi.org/10.1080/01612840.2018.1534910.

Koc, M., & Barut, E. (2016). Development and validation of New Media Literacy Scale (NMLS) for university students. Computers in human behavior, 63, 834-843. https://doi.org/10.1016/j.chb.2016.06.035

Kormas, G., Critselis, E., Janikian, M., Kafetzis, D., & Tsitsika, A. (2011). Risk factors and psychosocial characteristics of potential problematic and problematic internet use among adolescents: a cross-sectional study. BMC public health, 11(1), 1-8. https://doi.org/10.1186/1471-2458-11-595

Kożybska, M., Szpak, O., Kurpisz, J., Lebiecka, Z., Flaga-Gieruszyńska, K., Samochowiec, J., & Karakiewicz, B. (2019). Problematic Internet Use and health behaviors in adolescent residents of urban and rural areas in Poland–a cross-sectional study. Archives of Psychiatry and Psychotherapy, 4, 82-91. http://dx.doi.org/10.12740/APP/112014.

Langarizadeh, M., Naghipour, M., Tabatabaei, S. M., Mirzaei, A., & Vaghar, M. E. (2018). Prediction of internet addiction based on information literacy among students of Iran University of Medical Sciences. Electronic physician, 10(2), 6333.

Leung, L., & Lee, P. S. (2012a). The influences of information literacy, internet addiction and parenting styles on internet risks. New Media & Society, 14(1), 117–136. https://doi.org/10.1177/1461444811410406

Leung, L., & Lee, P. S. (2012b). Impact of internet literacy, internet addiction symptoms, and internet activities on academic performance. Social Science Computer Review, 30(4), 403-418. https://doi.org/10.1177/0894439311435217.

Li, G., Hou, G., Yang, D., Jian, H., & Wang, W. (2019). Relationship between anxiety, depression, sex, obesity, and internet addiction in Chinese adolescents: A short-term longitudinal study. Addictive Behaviors, 90, 421-427. http://dx.doi.org/10.1016/j.addbeh.2018.12.009.

Livingstone, S., Van Couvering, E., Thumim, N. (2019). Adult media literacy. https://www.ofcom.org.uk/research-and-data/media-literacy-research/adults; https://discovery.ucl.ac.uk/id/eprint/10000145/1/Buckinghammedialiteracy.pdf

Xianfeng, L. (2022, January). Media Use and the Level of New Media Literacy of the Prospective Chinese Language Teachers in the Post-COVID-19 Epidemic Era. In 2022 11th International Conference on Educational and Information Technology (ICEIT) (pp. 201-205). IEEE.https://doi.org/10.1109/ICEIT54416.2022.9690725.

Literat, I. (2014). Measuring New Media Literacies: Towards the Development of a Comprehensive Assessment Tool. Journal of media literacy education, 6(1), 15-27.

Liao, C. H., & Chang, H. S. (2010). Explore the influences on Taiwan students' information literacy with the Urban-rural differences from the perspective of globalization. Procedia-Social and Behavioral Sciences, 2(2), 3866-3870. https://doi.org/10.1016/j.sbspro.2010.03.606.

Lozano-Blasco, R., Robres, A. Q., & Sánchez, A. S. (2022). Internet addiction in young adults: A meta-analysis and systematic review. Computers in Human Behavior, 107201. https://doi.org/10.1016/j.chb.2022.107201

Machimbarrena, J. M., González-Cabrera, J., Ortega-Barón, J., Beranuy-Fargues, M., Álvarez-Bardón, A., & Tejero, B. (2019). Profiles of problematic internet use and its impact on adolescents' health-related quality of life. International journal of environmental research and public health, 16(20), 3877. https://doi.org/10.3390/ijerph16203877.

Maloney, E. J. (2007). What Web 2.0 can teach us about learning. Chronicle of Higher Education, 53(18), B26.

Mamun, M. A., Hossain, M. S., Moonajilin, M. S., Masud, M. T., Misti, J. M., & Griffiths, M. D.   (2020). Does loneliness, self-esteem, and psychological distress correlate with problematic internet use? A Bangladeshi survey study. Asia-Pacific Psychiatry, 12(2), e12386.https://doi.org/10.1111/appy.12386

Mamun, M. A., Hossain, M. S., Siddique, A. B., Sikder, M. T., Kuss, D. J., & Griffiths, M. D. (2019). Problematic internet use in Bangladeshi students: the role of socio-demographic factors, depression, anxiety, and stress. Asian journal of psychiatry, 44, 48-54. https://doi.org/10.1016/j.ajp.2019.07.005.

Masaeli, N. and Farhadi, H. (2021), "Prevalence of internet-based addictive behaviors during covid-19 pandemic: a systematic review", Journal of Addictive Diseases, Vol. 39 No. 4, pp. 468-488.

Mengistu, N., Tarekegn, D., Bayisa, Y., Yimer, S., Madoro, D., Assefa, D. G., ... & Duko, B. (2021). Prevalence and Factors Associated with Problematic Internet Use among Ethiopian Undergraduate University Students in 2019. Journal of Addiction, 2021, 1-8. https://doi.org/10.1155/2021/6041607

Miočić, B., & Perinić, J. (2014). New media literacy skills of youth in Zadar. Medijska istraživanja: znanstveno-stručni časopis za novinarstvo i medije, 20(2), 231-253. https://hrcak.srce.hr/file/197590.

Neverkovich, S. D., Bubnova, I. S., Kosarenko, N. N., Sakhieva, R. G., Sizova, Z. M., Zakharova, V. L., & Sergeeva, M. G. (2018). Students' internet addiction: study and prevention. Eurasia   Journal of Mathematics, Science and Technology Education, 14(4), 1483-1495.https://doi.org/10.29333/ejmste/83723

Onyekachi, B. N., Egboluche, F. O., & Chukwuorji, J. C. (2022). Parenting style, social interaction anxiety, and problematic internet use among students. Journal of Psychology in Africa, 32(1), 79-85. https://doi.org/10.1080/14330237.2021.2002030.

Ozkan, M., & Solmaz, B. (2015). Mobile addiction of generation z and its effects on their social lives:(An application among university students in the 18-23 age group). Procedia-Social and Behavioral Sciences, 205, 92-98. https://doi.org/10.1016/j.sbspro.2015.09.027.

Pawlowska, B., Zygo, M., Potembska, E., Kapka-Skrzypczak, L., Dreher, P., & Kedzierski, Z. (2015). Prevalence of Internet addiction and risk of developing addiction as exemplified by a group of Polish adolescents from urban and rural areas. Annals of Agricultural and Environmental Medicine, 22(1). https://doi.org/10.5604/12321966.1141382.

Pinkleton, B. E., Austin, E. W., Chen, Y. C. Y., & Cohen, M. (2012). The role of media literacy in shaping adolescents' understanding of and responses to sexual portrayals in mass media. Journal of Health Communication, 17(4), 460-476.

Saletti, S. M. R., Van den Broucke, S., & Chau, C. (2021). The effectiveness of prevention programs for problematic internet use in adolescents and youths: a systematic review and meta-analysis. Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 15(2).https://doi.org/10.5817/CP2021-2-10

Salik Sengul, Y., Kahraman, T., & Ozcan Kahraman, B. (2021). Problematic Facebook uses behavior and locus of control in physiotherapy students. Bulletin of Faculty of Physical Therapy, 26(1), 1-7. https://doi.org/10.1186/s43161-021-00031-1.

Scull, T. M., Kupersmidt, J. B., Malik, C. V., & Morgan-Lopez, A. A. (2018). Using media literacy education for adolescent sexual health promotion in middle school: Randomized control trial of Media Aware. Journal of Health Communication, 23(12), 1051-1063.https://doi.org/10.1080/10810730.2018.1548669.

Spada, M.M. (2014). An overview of problematic Internet use. Addictive Behaviors, 39(1), 3–6. https://doi.org/10.1016/j.addbeh.2013.09.007

Šporčić, B., & Glavak-Tkalić, R. (2018). The relationship between online gaming motivation, self-concept clarity, and tendency toward problematic gaming. Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 12(1). https://doi.org/10.5817/CP2018-1-4.

Starcevic, V. (2013). Is Internet addiction a useful concept? Australian & New Zealand Journal of Psychiatry, 47(1), 16–19. https://doi.org/10.1177/0004867412461693

Stavropoulos, V., Kuss, D. J., Griffiths, M. D., Wilson, P., & Motti-Stefanidi, F. (2017). MMORPG gaming and hostility predict Internet addiction symptoms in adolescents: An empirical multilevel longitudinal study. Addictive Behaviours, 64, 294-300. https://doi.org/10.1016/j.addbeh.2015.09.001

Su, W., Han, X., Jin, C., Yan, Y., & Potenza, M. N. (2019). Are males more likely to be addicted to the internet than females? A meta-analysis involving 34 global jurisdictions. Computers in Human Behavior, 99, 86-100. http://dx.doi.org/10.1016/j.chb.2019.04.021.

Syam, H. M., & Nurrahmi, F. (2020). 'I Don't Know If It Is Fake or Real News' How Little Indonesian University Students Understand Social Media Literacy. Jurnal Komunikasi: Malaysian Journal of Communication, 36(2), 92-105.https://doi.org/10.17576/JKMJC-2020-3602-06.

Taha, P. H., Esmael, B. M. S., & Al-Dabbagh, S. A. (2016). Internet use and addiction among students of the University of Duhok. DMJ, 10(2), 21-35.

Tajalli, F., & Zarnaghash, M. (2017). Effect of family communication patterns on Internet addiction. Practice in Clinical Psychology, 5(3), 159-166.https://doi.org/10.18869/acadpub.jpcp.5.3.159.

Tateno, M., Teo, A. R., Ukai, W., Kanazawa, J., Katsuki, R., Kubo, H., & Kato, T. A. (2019). Internet addiction, smartphone addiction, and Hikikomori trait in Japanese young adult: social isolation and social network. Frontiers in psychiatry, 10, 455. http://dx.doi.org/10.3389/fpsyt.2019.00455.

Thorsteinsson, E. B., & Davey, L. (2014). Adolescents' compulsive Internet use and depression: A longitudinal study. Open Journal of Depression, 3, 13–17.https://doi.org/10.4236/ojd.2014.31005

Toffler, A. (1981). The third wave. New York: Morrow.

Tomaszek, K., & Muchacka-Cymerman, A. (2019). Sex differences in the relationship between student school burnout and problematic internet use among adolescents. International journal   of environmental research and public health, 16(21), 4107. http://dx.doi.org/10.3390/ijerph16214107.

Tran, B. X., Mai, H. T., Nguyen, L. H., Nguyen, C. T., Latkin, C. A., Zhang, M. W. B., & Ho, R. C. M. (2017). Vietnamese validation of the short version of the Internet Addiction Test. Addictive Behaviors Reports, 6(June), 45–50. https://doi.org/10.1016/j.abrep.2017.07.001.

Verseillié, É., Laconi, S., & Chabrol, H. (2020). Pathological traits associated with Facebook and Twitter among French users. International Journal of Environmental Research and Public Health, 17(7), 2242. https://doi.org/10.3390/ijerph17072242.

Vorderer, P., Krömer, N., & Schneider, F. M. (2016). Permanently online–Permanently connected: Explorations into university students' use of social media and mobile smart devices. Computers in Human Behavior, 63, 694-703. https://doi.org/10.1016/j.chb.2016.05.085.

Vraga, E. K., Tully, M. (2019). News literacy, social media behaviors, and skepticism toward information on social media. Information, Communication & Society, 24, 150-166. https://doi.org/10.1080/1369118X.2019.1637445.

Wahyuni, E. N., & Maksum, A. (2020, February). Self-Esteem and Social Media Addiction among College Students: Contribution Gender as Moderator. In Proceeding of International Conference on Engineering, Technology, and Social Sciences (ICONETOS) (Vol. 1, No. 1, pp. 34-38). https://doi.org/10.18860/iconetos.v1i1.1153.

Wallace, P. (2014). Internet addiction disorder and youth. EMBO Reports, 15(1), 12–16. https://doi.org/10.1002/embr.201338222

Wang G. Z. (2015). Internet Addiction of Teenagers and Network Literacy Education. Modern Communication, 2, 143-147.

Wegmann, E., Stodt, B., & Brand, M. (2015). Addictive use of social networking sites can be explained by the interaction of Internet use expectancies, Internet literacy, and psychopathological symptoms. Journal of behavioral addictions, 4(3), 155-162. https://doi.org/10.1556/2006.4.2015.021

World Health Organization. (2015). Public health implications of excessive use of the Internet, computers, smartphones and similar electronic devices: Meeting report.http://apps.who.int/iris/bitstream/10665/184264/1/9789241509367_eng.pdf

Verseillié, É., Laconi, S., & Chabrol, H. (2020). Pathological traits associated with Facebook and Twitter among French users. International Journal of Environmental Research and Public Health, 17(7), 2242. https://doi.org/10.1080/1369118X.2019.1645192.

Xiao, X., Su, Y., & Lee, D. K. L. (2021). Who consumes new media content more wisely? Examining personality factors, SNS use, and new media literacy in the era of misinformation. Social Media+ Society, 7(1), 2056305121990635. https://doi.org/10.1177/2056305121990635.

Xin, M., Xing, J., Pengfei, W., Houru, L., Mengcheng, W., & Hong, Z. (2018). Online activities,   the prevalence of Internet addiction and risk factors related to family and school among adolescents in China. Addictive Behaviors Reports, 7, 14–18. https://doi.org/10.1016/j.abrep.2017.10.003.

Xiong X. X. (2019). Analysis of the Complexity of Teenagers' Internet Deviations. New Media Research, 5, 89-90+106.

Yang X., & Zhang L. X.(2015). The review of media literacy research. Journal of News Research,8, 13-14+77.

Yildiz Durak, H., Saritepeci, M. Modeling the effect of new media literacy levels and social media usage status on problematic internet usage behaviours among high school students. *Educ Inf Technol* 24, 2205–2223 (2019). https://doi.org/10.1007/s10639-019-09864-9

Younes F, Halawi G, Jabbour H, El Osta N, Karam L, Hajj A, et al. (2016) Internet Addiction and Relationships with Insomnia, Anxiety, Depression, Stress and Self-Esteemin University Students: A Cross-Sectional Designed Study. PLoS ONE 11(9): e0161126. https://doi.org/10.1371/journal.pone.0161126

Young, K., Pistner, M., O'mara, J., & Buchanan, J. (1999). Cyber disorders: The mental health concern for the new millennium. Cyberpsychology & behavior, 2(5), 475-479.

Yu, C., Li, X., & Zhang, W. (2015). Predicting adolescent problematic online game use from teacher autonomy support, basic psychological needs satisfaction, and school engagement: A 2-year longitudinal study. CyberPsychology, Behavior, and Social Networking, 18,   228–233.https://doi.org/10.1089/cyber.2014.0385

Yu, L., Recker, M., Chen, S., Zhao, N., & Yang, Q. (2018). The moderating effect of geographic area on the relationship between age, gender, and information and communication technology literacy and problematic internet use. Cyberpsychology, Behavior, and Social Networking, 21(6), 367-373. https://doi.org/10.1089/cyber.2017.0503.

Zhang, H., Li, D., & Li, X. (2015). Temperament and problematic Internet use in adolescents: A moderated mediation model of maladaptive cognition and parenting styles. Journal of child and family studies, 24(7), 1886-1897.

Zhang, H., Zhu, C., & Sang, G. (2014). Teachers' stages of concern for media literacy education   and the integration of MLE in Chinese primary schools. Asia Pacific Education Review, 15(3), 459-471.

Zhong, B., Wang, Q., Chen, J., & Li, Y. (2016). An exploration of three-dimensional integrated assessment for computational thinking. Journal of Educational Computing Research, 53(4), 562-590. doi:10.1177/0735633115608444.

Zhao X., & Wu M. Z.(2021). Research on the Current Situation of the Alienation of College Students' Network Behavior and Its Governance Path. Heilongjiang Education (Research and Evaluation of Higher Education, 2, 89-92.

AMB UN ALT NIVELL D'ALFABETITZACIÓ MEDIÀTICA, ¿PODEM EVITAR L'ÚS PROBLEMÀTIC D'INTERNET? – UN ESTUDI DE CASOS D'ESTUDIANTS UNIVERSITARIS XINESOS

L'ús problemàtic d'Internet (piu) pot causar disfunció i conseqüències adverses, especialment en adolescents i adolescents. Els estudis han demostrat que les característiques emocionals personals i les relacions amb els altres estan relacionades amb la piu. Explorem una pregunta ignorada sobre si hi ha una correlació entre les habilitats personals (com l'alfabetització en nous mitjans (nml) i el piu. El piu dels estudiants universitaris xinesos no ha rebut prou atenció acadèmica i la seva relació amb l'NML encara no és clara Per tant, provem la correlació entre piu i NML en 462 estudiants universitaris xinesos Els resultats mostren que el piu existeix àmpliament en diversos graus, amb una puntuació NML de 4,23 punts (5 punts complets). relacionat amb el piu, especialment la dimensió crítica cap endavant.El gènere no té cap impacte a la piu ni a l'alfabetització dels nous mitjans.El lloc de residència de l'estudiant només està positivament relacionat amb nml, però no amb piu. I el lloc de residència no s'ajusta a la correlació entre NML i piu, tampoc hi ha correlació entre gènere i piu. Aquestes troballes aporten una comprensió profunda de la relació entre els éssers humans i Internet i són d'importància pràctica per a les intervencions preventives en adults.

PARAULES CLAU: Ús problemàtic d'internet; pressumpció crítica; alfabetització en nous mitjans

CON UNA ALTA ALFABETIZACIÓN MEDIÁTICA, ¿ PODEMOS EVITAR EL USO PROBLEMÁTICO DE INTERNET? - ESTUDIO DE CASOS DE ESTUDIANTES UNIVERSITARIOS CHINOS

El uso problemático de Internet (piu) puede causar disfunción y consecuencias adversas, especialmente en adolescentes. Los estudios han demostrado que las características emocionales personales y las relaciones con los demás están relacionadas con la piu. Exploramos una pregunta ignorada sobre si hay una correlación entre las habilidades personales (como la alfabetización en nuevos medios (nml) y el piu. El piu de los estudiantes universitarios chinos no ha recibido suficiente atención académica y su relación con el NML aún no está clara. Por lo tanto, probamos la correlación entre piu y NML en 462 estudiantes universitarios chinos. Los resultados muestran que el piu existe ampliamente en diversos grados, con una puntuación NML de 4,23 puntos (5 puntos completos). El NML personal está positivamente relacionado con el piu, especialmente la dimensión crítica. El género no tiene ningún impacto en la piu ni en la alfabetización de los nuevos medios. El lugar de residencia del estudiante solo está positivamente relacionado con nml, pero no con piu. El sexo y el lugar de residencia no muestran correlación entre NML y piu, y el lugar de residencia no se correlaciona entre género y piu. Estos hallazgos aportan una comprensión profunda de la relación entre los seres humanos e Internet y son de importancia práctica para las intervenciones preventivas en adultos.

PALABRAS CLAVE: uso problemático de internet; presunción crítica; alfabetización en nuevos medios