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Prevalence of problematic Internet use and factors associated among honduran university students

Prevalencia del uso problemático de Internet y factores asociados en estudiantes universitarios hondureños



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ABSTRACT

Currently, Internet use is widespread among young people. Although properly regulated use of the Internet can have positive consequences in various areas, excessive and uncontrolled use has been associated with numerous negative outcomes. This study examines the prevalence of problematic Internet use (PIU) among Honduran university students and identifies the sociodemographic and personality variables associated with it. The sample comprised 791 university students, and descriptive, correlation, and comparative analyses were performed. Results show high rates of PIU among university students, particularly women, and reveal that PIU is associated with a high degree of neuroticism and low levels of extraversion, agreeableness, conscientiousness, openness to experience, and self-esteem. This study provides insights into PIU-related factors that may increase the chances of early detection and intervention.

RESUMEN

Actualmente, se ha producido un gran desarrollo tecnológico y el uso de internet entre los jóvenes está ampliamente presente. Si bien el uso adecuado de Internet puede tener consecuencias positivas en diferentes ámbitos, una utilización excesiva e incontrolada se ha asociado con numerosos resultados negativos. El objetivo de este estudio es estudiar la prevalencia del uso problemático de internet (UPI) en estudiantes universitarios hondureños y en identificar variables sociodemográficas y de personalidad asociadas al UPI. La muestra estuvo compuesta por 791 estudiantes universitarios. Se han realizado análisis descriptivos, correlaciones y comparativos. Los resultados ponen de manifiesto elevadas tasas de UPI en los estudiantes universitarios, mayor entre las mujeres, y que el UPI se asocia con un alto grado de neuroticismo y con bajos niveles de extraversión, cordialidad, responsabilidad, apertura a la experiencia y autoestima. En conclusión, este estudio ofrece información sobre factores relacionados con el UPI que pueden aumentar las posibilidades de una temprana detección e intervención.

PALABRAS CLAVES · KEYWORDS

Technological development; higher education; Internet; personality; self-esteem
Desarrollo tecnológico; enseñanza superior; Internet; personalidad; respeto de sí mismo

1. Introduction

Access to and utilisation of the Internet have continued to grow over the last two decades. According to Miniwatts Marketing Group (2023), there are 5.385 billion users worldwide, which represents a 1,392% increase since 2000. Although Internet use has numerous advantages, particularly in terms of communication and information access (Brooks et al., 2020), excessive and uncontrolled use can become problematic.

Problematic Internet use (PIU), also referred to in scientific literature as Internet addiction disorder or pathological Internet use, is conceptualised as excessive and compulsive Internet use that causes irritation when use is restricted and can lead to psychological, social, academic, or occupational difficulties. Multiple authors have studied PIU since the 1990s (Beard & Wolf, 2001; Goldberg, 1996; Griffiths, 1995; Young, 1996). Although neither the DSM-5 (American Psychiatric Association, 2013) nor the ICD-11 (World Health Organization, 2018) has recognised PIU as a disorder, the World Health Organization (2015) has expressed concerns about this condition and considers it a public health issue.

Two recent meta-analyses conducted by Pan et al. (2020) and Meng et al. (2022) estimate the prevalence of PIU among the general population to range from 7.02% to 14.22%. Furthermore, several meta-analyses focused on youth and university students (Joseph et al., 2021; Lozano-Blasco et al., 2022; Salarvand et al., 2022) have found that the prevalence in this group is higher than among the general population, which suggests that they are at special risk.

Numerous physical and mental health problems have been associated with PIU, including eating disorders (Hinojo-Lucena et al., 2019), alcohol and drug use (Kapus et al., 2021), emotional dysregulation (Gioia et al., 2021), depression (Ostinelli et al., 2021), increased risk of self-harm (Duarte et al., 2023), and lower overall subjective well-being (Teng et al., 2020). These negative health consequences, as well as PIU's especially high prevalence among young people, suggest that the study of its predictive factors is particularly important.

The I-PACE model (Brand et al., 2016), one of the most widely used theoretical frameworks in the scientific literature for explaining the development and persistence of PIU, indicates that certain personality traits are key to its development. Although numerous personality classifications exist in the literature, the five-factor model has been most commonly employed in recent decades (Costa & McCrae, 1992); this taxonomy proposes a conceptualisation based on five dimensions: 1) extraversion—the propensity to be sociable, dominant, and experience positive emotions; 2) agreeableness—the predisposition to be trusting, compliant, and kind; 3) conscientiousness—the tendency to exhibit high self-control and be organised, hardworking, and respectful; 4) neuroticism—the predisposition to perceive ordinary situations as threatening, experience negative emotions, and exhibit low self-control; and 5) openness to experience—the tendency to be creative and to value and seek new experiences. A meta-analysis by Kayış et al. (2016) found that PIU is negatively related to extraversion, agreeableness, conscientiousness, and openness to experience, whereas it has a positive relationship to neuroticism. Several subsequent studies (Przepiorka et al., 2021; Tian et al., 2021; Zhou et al., 2021) have found similar relationships between the five-factor model personality factors and PIU, but there is a lack of research conducted in Latin America. Given that the association between personality and PIU may

be moderated by culture and geographic area (Mak et al., 2021), it is thus imperative to continue examining this relationship in these countries.

In addition to the five-factor model, numerous recent studies have also indicated that self-esteem or self-respect may play an important role in predicting PIU (Chen et al., 2020; Donald et al., 2019; Lai et al., 2023; Mo et al., 2020). Self-esteem is a personality trait defined as the overall evaluation of one's own worth (Rosenberg, 1965); a low level of self-esteem is associated with both substance and behavioural addictions (Hidalgo-Fuentes, 2023; Muche & Asrese, 2022; Saiphoo et al., 2020; Yazdi-Feyzabadi et al., 2019). According to Echeburúa and Requesens (2012), healthy self-esteem is a protective factor against PIU. Other authors (Moral & Fernández, 2019) have demonstrated that low self-esteem predicts PIU. Despite these findings, the predictive and/or moderating nature of self-esteem has not been fully determined, nor has the direction of the relationship between self-esteem and PIU been elucidated; thus, there is still progress to be made in this area (Hinojo-Lucena et al., 2021).

Despite the growing body of research on PIU, studies conducted in developing countries are scarce, and to our knowledge, no study has estimated the prevalence of PIU in the Honduran population. The present work has a dual objective: first, it estimates the prevalence of PIU in a sample of university students in Honduras, and second, it identifies sociodemographic and personality variables that differ between university students with PIU and those whose use of this technology remains normal.

2. Methodology

2.1. Participants

The non-probabilistic convenience sample consisted of 791 students, ages 17–64 years ($M = 26.29$; $SD = 8.02$), from the National Pedagogical University Francisco Morazán, of whom 611 were female (77.2%) and 180 were male (22.8%). The sample size is considerably larger than the minimum required (i.e., 352 participants) using Soper's a priori sample size calculator for Student's t -tests (<https://www.danielsoper.com/statcalc/calculator.aspx?id=47>), assuming an effect size of 0.3, a power of 0.80, and a significance level of 0.05.

2.2. Instruments

Participants' PIU was assessed using the Internet Addiction Test (IAT; Young, 1998), which comprises 20 items (e.g., "How often do you try to cut down the amount of time you spend online and fail?") regarding the frequency of behaviours related to Internet use. Participants answer these using a six-point Likert scale, ranging from 0 (*never*) to 5 (*always*). The scale's total score ranges from 0 to 100, with a score equal to or greater than 50 indicating PIU. The present research used the Spanish adaptation by Fernández-Villa et al. (2015), which showed a reliability of $\alpha = .94$.

We examined the factors belonging to the five-factor model of personality, using the Big Five Inventory short form (BFI-2-S; Soto & John, 2017b), a shortened version of the BFI-2

(Soto & John, 2017a). The BFI-2-S consists of 30 items (e.g., “Is suspicious of others’ intentions”), six for each of the model’s personality factors (i.e., extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience). Participants answered these 30 items using a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). We used the Spanish adaptation by Gallardo-Pujol et al. (2022), and the scales of extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience presented internal consistency coefficients of $\alpha = .62$, $\alpha = .59$, $\alpha = .75$, $\alpha = .63$, and $\alpha = .53$, respectively.

Self-esteem was assessed using the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965). This comprises 10 items regarding positive and negative feelings towards oneself (e.g., “I am able to do things as well as most other people”) that are answered on a four-point Likert scale, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Total scores range from 10 to 40, with higher scores indicating higher self-esteem. In this study, we used the Spanish adaptation by Gómez-Lugo et al. (2016), which showed an internal consistency of $\alpha = .87$.

We used an ad hoc sociodemographic questionnaire developed for the present study to collect information about the participants, including gender, age, daily hours of Internet use, alcohol and tobacco consumption in the past month, and current relationship status.

2.3. Procedure

Study approval was obtained from the Research Ethics Committee of the National Pedagogical University Francisco Morazán (code 20203-003). An online survey created using Google Forms was distributed to students via social networks in May and June 2023. The first page of the questionnaire provided information about the study’s objectives, as well as its anonymous and voluntary nature. Participants were required to provide informed consent before beginning the tests. The average completion time was 15 minutes, and students did not receive any incentives for their participation.

3. Analysis and Results

3.1. Data Analysis

All analyses were conducted using SPSS 28.0. Descriptive statistics were calculated, including the mean and standard deviation for continuous variables and frequencies and percentages for categorical variables. Skewness and kurtosis statistics were examined to assess the fit of continuous variables to the assumption of normality; all variables had skewness and kurtosis values ranging from -2 to 2 . According to the criteria of George and Mallery (2010) and Gravetter and Wallnau (2014), the data were normally distributed. The correlation between variables was measured using Pearson’s r . To examine potential differences between students with PIU and those with normal Internet use, both in the total sample and by gender, we used the chi-square test for categorical variables and the independent samples t -test for quantitative data. Effect sizes were assessed using Cohen’s d and Cramer’s V , interpreted according to the criteria proposed by Cohen (1988) and Kim (2017), respectively.

3.2. Results

Table 1 presents the characteristics of the sample, with data expressed as means and standard deviations or as frequencies and percentages, depending on the type of variable.

Table 1

Descriptive Characteristics of the Sample (n = 791)

Variables	<i>M</i>	<i>SD</i>	<i>n</i>	%
Age	26.29	8.02		
Gender				
Men			180	22.8
Women			611	77.2
Alcohol consumption				
Yes			112	14.16
No			679	85.84
Tobacco consumption				
Yes			21	2.62
No			770	97.35
Current relationship status				
Yes			398	50.32
No			393	49.68
Daily hours of Internet use	3.28	0.89		

Correlation analyses demonstrate statistically significant correlations between PIU and both self-esteem and the factors of the five-factor model of personality (see Table 2). The correlation between neuroticism and PIU is positive and of small magnitude ($r = .262$; $p < .001$), whereas extraversion ($r = -.254$; $p < .001$), agreeableness ($r = -.345$; $p < .001$), conscientiousness ($r = -.504$; $p < .001$), openness to experience ($r = -.287$; $p < .001$), and self-esteem ($r = -.384$; $p < .001$) show negative correlations of small to moderate magnitudes.

Table 2
Bivariate Pearson Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	--												
2. Gender	-.027	--											
3. Alcohol consumption	.021	.074 [*]	--										
4. Tobacco consumption	-.040	.098 ^{***}	.316 ^{***}	--									
5. Current relationship status	-.338 ^{**}	-.064	.063	.054	--								
6. Hours of Internet use	-.195 ^{**}	.046	-.098 ^{**}	-.028	.056	--							
7. Extraversion	-.035	-.014	.020	.042	.096 ^{***}	-.044	--						
8. Agreeableness	-.080 [*]	-.016	.027	.065	.086 [*]	.003	.285 ^{***}	--					
9. Conscientiousness	-.018	-.034	.040	.026	.079 [*]	.018	.418 ^{***}	.525 ^{***}	--				
10. Neuroticism	-.003	.035	-.036	-.006	-.067	.036	-.390 ^{***}	-.251 ^{***}	-.331 ^{***}	--			
11. Openness	-.034	.011	.025	.066	.093 ^{**}	-.024	.434 ^{***}	.428 ^{***}	.420 ^{***}	-.238 ^{***}	--		
12. Self-esteem	-.004	-.069	-.006	.009	.066	.022	.478 ^{***}	.326 ^{***}	.437 ^{***}	-.474 ^{***}	.277 ^{***}	--	
13. PIU	.019	.067	-.021	-.004	-.019	-.020	-.254 ^{***}	-.345 ^{***}	-.504 ^{***}	.262 ^{***}	-.287 ^{***}	-.384 ^{***}	--

Note. ^{*} $p < .05$; ^{**} $p < .01$; ^{***} $p < .001$

As Table 3 shows, after applying the IAT cut-off point (score ≥ 50), 161 participants in the study exhibited PIU (20.35%), whereas 630 students were classified in the nonproblematic use group (79.65%). Chi-square analyses were conducted to examine differences between groups with regard to the categorical variables (gender, alcohol consumption, tobacco consumption, and current relationship status), and Student's t -tests were performed for the quantitative variables (age, daily hours of Internet use, extraversion, agreeableness, conscientiousness, neuroticism, openness to experience, and self-esteem). As Table 3 illustrates, significant differences in the categorical variables were found only in relation to gender, with the percentage of women in the sample exhibiting PIU (21.9%) being higher than that of men (15%), though the associated effect size is small. Regarding the factors of the five-factor model of personality, participants with PIU scored significantly higher in neuroticism, with a moderate effect size; in terms of extraversion, agreeableness, conscientiousness, and openness to experience, they scored significantly lower, with moderate effect sizes for extraversion and openness to experience, and large effect sizes for agreeableness and conscientiousness. Finally, with regard to self-esteem, students with PIU also demonstrated significantly lower scores, with a large effect size.

Table 3*Participant Characteristics in Relation to PIU*

Variables	No PIU (<i>n</i> = 630)	PIU (<i>n</i> = 161)	<i>p</i>	Effect size
Age, <i>M</i> ± <i>SD</i>	26.4 ± 8.18	25.84 ± 7.37	.426 ^a	0.70 ^c
Women, <i>n</i> (%)	477 (75.7)	134 (83.2)	.042 ^b	0.08 ^d
Alcohol consumption, <i>n</i> (%)	86 (13.7)	26 (16.1)	.417 ^b	0.03 ^d
Tobacco consumption, <i>n</i> (%)	17 (2.7)	4 (2.5)	.880 ^b	0.01 ^d
Currently in a relationship, <i>n</i> (%)	322 (51.1)	76 (47.2)	.376 ^b	0.04 ^d
Daily hours of Internet use, <i>M</i> ± <i>SD</i>	3.26 ± 0.90	3.33 ± 0.86	.395 ^a	−0.08 ^c
Extraversion, <i>M</i> ± <i>SD</i>	20.57 ± 4.19	18.82 ± 4.02	< .001 ^a	0.42 ^c
Agreeableness, <i>M</i> ± <i>SD</i>	24.61 ± 3.51	21.83 ± 3.81	< .001 ^a	0.78 ^c
Conscientiousness, <i>M</i> ± <i>SD</i>	24.44 ± 4.10	20.04 ± 3.84	< .001 ^a	1.09 ^c
Neuroticism, <i>M</i> ± <i>SD</i>	16.67 ± 4.38	18.45 ± 3.84	< .001 ^a	−0.42 ^c
Openness, <i>M</i> ± <i>SD</i>	22.59 ± 3.69	20.70 ± 3.37	< .001 ^a	0.52 ^c
Self-esteem, <i>M</i> ± <i>SD</i>	32.87 ± 6.19	28.21 ± 5.87	< .001 ^a	0.76 ^c

Note. ^aStudent's *t*-test; ^bSpearman's chi-square test; ^cCohen's *d*; ^dCramer's *V*.

There were no gender differences between students with PIU and those without (see Tables 4 and 5), apart from the fact that for men, there was no statistically significant difference in the level of neuroticism between those with PIU and those with normal Internet use, whereas women with PIU scored significantly higher on neuroticism than those without, with a moderate effect size.

Table 4*Characteristics of Male Participants in Relation to PIU*

Variables	No PIU (<i>n</i> = 153)	PIU (<i>n</i> = 27)	<i>p</i>	Effect size
Age, <i>M</i> ± <i>SD</i>	26.50 ± 8.39	27.70 ± 9.66	.504 ^a	−0.14 ^c
Alcohol consumption, <i>n</i> (%)	30 (19.6)	4 (14.8)	.557 ^b	0.04 ^d
Tobacco consumption, <i>n</i> (%)	9 (5.9)	1 (3.7)	.649 ^b	0.03 ^d
Currently in a relationship, <i>n</i> (%)	68 (44.4)	12 (44.4)	1 ^b	0.00 ^d
Daily hours of Internet use, <i>M</i> ± <i>SD</i>	3.22 ± 0.89	3.11 ± 0.85	.571 ^a	0.12 ^c
Extraversion, <i>M</i> ± <i>SD</i>	20.69 ± 4.00	18.22 ± .02	< .008 ^a	0.61 ^c
Agreeableness, <i>M</i> ± <i>SD</i>	24.56 ± 3.76	21.89 ± 3.58	< .001 ^a	0.71 ^c
Conscientiousness, <i>M</i> ± <i>SD</i>	24.33 ± 4.22	20.93 ± 3.28	< .001 ^a	0.83 ^c
Neuroticism, <i>M</i> ± <i>SD</i>	16.69 ± 4.09	17.07 ± 2.60	< .641 ^a	−0.10 ^c
Openness, <i>M</i> ± <i>SD</i>	22.40 ± 3.26	20.59 ± 2.98	< .007 ^a	0.56 ^c
Self-esteem, <i>M</i> ± <i>SD</i>	33.47 ± 5.58	28.56 ± 4.36	< .001 ^a	0.91 ^c

Note. ^aStudent's *t*-test; ^bSpearman's chi-square test; ^cCohen's *d*; ^dCramer's *V*.

Table 5*Characteristics of Female Participants in Relation to PIU*

Variables	No PIU (<i>n</i> = 477)	PIU (<i>n</i> = 134)	<i>p</i>	Effect size
Age, <i>M</i> ± <i>SD</i>	26.37 ± 8.19	25.46 ± 6.80	.192 ^a	−0.12 ^c
Alcohol consumption, <i>n</i> (%)	56 (11.7)	22 (16.4)	.152 ^b	0.06 ^d
Tobacco consumption, <i>n</i> (%)	8 (1.7)	3 (2.2)	.666 ^b	0.02 ^d
Currently in a relationship, <i>n</i> (%)	254 (53.2)	64 (47.8)	.261 ^b	0.05 ^d
Hours of Internet use, <i>M</i> ± <i>SD</i>	3.28 ± 0.91	3.37 ± 0.86	.272 ^a	0.11 ^c
Extraversion, <i>M</i> ± <i>SD</i>	20.53 ± 4.26	18.94 ± 3.99	< .001 ^a	0.38 ^c
Agreeableness, <i>M</i> ± <i>SD</i>	24.62 ± 3.43	21.82 ± 3.87	< .001 ^a	0.80 ^c
Conscientiousness, <i>M</i> ± <i>SD</i>	24.47 ± 4.06	19.87 ± 3.93	< .001 ^a	1.14 ^c
Neuroticism, <i>M</i> ± <i>SD</i>	16.66 ± 4.47	18.73 ± 3.99	< .001 ^a	−0.47 ^c
Openness, <i>M</i> ± <i>SD</i>	22.65 ± 3.82	20.72 ± 3.46	< .001 ^a	0.51 ^c
Self-esteem, <i>M</i> ± <i>SD</i>	33.68 ± 6.36	28.13 ± 6.04	< .001 ^a	0.72 ^c

Note. ^aStudent's *t*-test; ^bSpearman's chi-square test; ^cCohen's *d*; ^dCramer's *V*.

4. Discussion and Conclusions

The present study aimed to examine the prevalence of PIU among Honduran university students, given that PIU is associated with numerous negative health consequences, especially among students (Cai et al., 2023). It also aimed to investigate the role of sociodemographic and personality variables in this condition.

Concerning the prevalence of PIU, after applying the IAT cut-off point, 20.35% of the sample exhibited PIU. This is higher than the rate found among the general population, according to the meta-analyses conducted by Pan et al. (2020) and Meng et al. (2022). This outcome is expected, as university students appear to have a greater vulnerability to developing PIU due to characteristics such as easy access to this technology, little or no parental supervision, free time, and stress caused by academic obligations and tasks (Mengistu et al., 2021; Pedrelli et al., 2014).

No differences were found between students with PIU and those without in terms of age. Although several studies have found that age has a negative relationship with PIU (e.g. Sechi et al., 2021), the fact that in this study, the participants with and without PIU belong to the same age group may have contributed to the lack of significant differences in terms of this variable.

Regarding gender, women exhibited a significantly higher prevalence of PIU than men, which contradicts the findings of the meta-analysis conducted by Su et al. (2019). One possible explanation is that gender differences seem to vary depending on the specific types of PIU, with women having higher levels of some types, such as Internet use for social networking (Tang et al., 2017). Therefore, it would be advisable for future studies to assess not only the level of PIU but also participants' specific types of Internet use.

Although various studies have linked PIU with increased alcohol and tobacco consumption (Chaleshi et al., 2023; Kapus et al., 2021), in this study, we found no significant

differences between groups (i.e., those with PIU and those with normal Internet use) in relation to the consumption of these substances. The fact that the percentage of alcohol and tobacco consumers was very low among the study participants may have influenced this result.

No differences were found in relationship status between participants with and without PIU. This contradicts findings from studies such as those conducted by Khazaie et al. (2023) and Karimy et al. (2020), which found a lower tendency towards PIU among married or partnered university students, due to factors such as having less free time given the need to balance studies and work while coping with family responsibilities. However, other studies (Chalesi et al., 2023; Salehi et al., 2014) have also found no link between relationship status and PIU, so further examination would be advisable.

Although various studies have found that spending more hours on the Internet daily predisposes individuals to PIU (Kapus et al., 2021; Nakayama et al., 2020; Zewde et al., 2022), we found no differences between those with and without PIU in terms of the number of hours per day they used the Internet. Thus, in this sample, the symptoms of PIU seem to be associated with students' perceived use, rather than actual use.

In relation to the five-factor model of personality, students with PIU scored significantly lower in extraversion compared with those with normal use, which aligns with findings from various previous studies (Hawi & Samaha, 2019; Peterka-Bonetta et al., 2019). One possible explanation is that individuals with higher levels of introversion engage in excessive Internet use, especially on social media, to compensate for fewer real-life relationships (Woodcock et al., 2013).

Similarly, students with PIU also showed lower levels of agreeableness, which is consistent with various previous studies (Agbaria & Mokh, 2021; Jojo & Sundaramoorthy, 2022), indicating that agreeableness can be a protective factor against PIU, as individuals with high levels of agreeableness tend to have lower levels of stress and often use adaptive coping strategies. In addition, much like individuals with low extraversion, those with low levels of agreeableness also have difficulties initiating and maintaining social relationships, which may lead them to engage in excessive use of social media to try to compensate for this lack of face-to-face relationships (Kircaburun, 2016).

The finding that students with PIU scored lower in terms of conscientiousness compared with students with normal Internet use, as well as the fact that this was a high-magnitude difference, is an expected result that aligns with numerous studies (Jojo & Sundaramoorthy, 2022; Przepiorka et al., 2021; Tian et al., 2021). According to the I-PACE model (Brand et al., 2016), low conscientiousness is one of the most important predictors of PIU because the disorganisation, lack of self-discipline, and low sense of obligation that characterise individuals with low levels of this trait make it difficult for them to control their Internet usage time.

Neuroticism is the only personality trait in which the students with PIU scored higher than students with normal Internet use. This, too, is an expected result given that in addition to its association with PIU (Kayaş et al., 2016), neuroticism has been linked to related behaviours, such as problematic smartphone (Marengo et al., 2020), social media (Akbari et al., 2022), and video games (Chew et al., 2022) use. In a review of 56 studies, Marciano et al. (2022) found that neuroticism was a predictor of PIU because individuals with high levels of emotional instability find that the Internet provides an environment in which they

can cope with their negative emotions. However, when examining differences between students by gender, men with and without PIU did not differ in terms of neuroticism, whereas women did; those with PIU exhibited higher neuroticism. Various recent studies have found that female university students are more prone to experiencing stress or anxiety than are males (Prowse et al., 2021; Strom et al., 2022), as well as to using more emotion-focused coping strategies compared with males (Graves et al., 2021); this might lead them to use the Internet to try to reduce their anxiety, increasing the risk of PIU.

In relation to openness to experience, students with PIU scored significantly lower than those who did not present this condition. According to Tian et al. (2021), openness to experience may function as a protective factor against behaviours involved in PIU because individuals with high levels of this trait show a preference for changing activities, meaning their Internet use is likely to be more intermittent. However, it is necessary to continue examining this relationship, as other studies (Miskulin et al., 2022; Servidio, 2014) have found that a high openness to experience is associated with higher levels of PIU.

Finally, participants with PIU showed significantly lower self-esteem scores, which is consistent with recent scientific literature (Chen et al., 2020; Khosravi et al., 2022; Lai et al., 2023; Mo et al., 2020). Individuals with low self-esteem prefer to interact through social media, as they often find face-to-face relationships stressful (Kawyannejad et al., 2019; Luo & Hancock, 2020), which could make them more predisposed to PIU as they try to satisfy their need to belong.

The present study has several limitations that must be considered when interpreting the results. First, the findings may not be entirely generalisable as a non-probabilistic sampling method was used, and the sample was not balanced in terms of participants' gender. Second, the cross-sectional design precludes establishing the direction of the relationships found, so it would be advisable to employ long-term longitudinal designs to continue examining the causal relationships between the study variables. Third, the study did not account for the time that university students use the Internet for educational and learning purposes. It would be interesting for future research to consider participants' various uses of the Internet and whether these are related to a higher or lower prevalence of PIU. Finally, the data were obtained through self-report measures, so despite being validated in multiple contexts, they are susceptible to social desirability biases.

In conclusion, this study is the first to establish the prevalence of PIU among university students in Honduras. The results of this research indicate that university students with PIU were more likely to be female and exhibit higher levels of neuroticism and lower levels of extraversion, agreeableness, conscientiousness, openness to experience, and self-esteem compared with those students who did not exhibit this condition. This confirms the importance of personality in the development and maintenance of PIU. These findings can be useful when establishing criteria for detecting students with a greater tendency to develop PIU as well as for the development of intervention programs.

Contribuciones de autores

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Aplicaciones tecnológicas relacionadas con la edad temprana infantil

Technology applications related to early childhood

Coordinadora:



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Introducción

Decir que las aplicaciones tecnológicas están relacionadas con la primera infancia es quedarse corto.

La primera infancia es un estadio de desarrollo que mejora la vida escolar. Es la etapa más importante para cambiar la vida futura de un niño. La educación de un niño empieza en casa.

La tecnología determina la calidad de la educación temprana de un individuo. La educación infantil mejora los conocimientos, las habilidades y desarrolla la personalidad y la actitud de los niños. Sobre todo, la tecnología en la primera infancia afecta la familia del niño.

Un niño con un alto grado de ayudas tecnológicas aumenta su capacidad de desarrollo.

En este monográfico sobre la importancia de las aplicaciones tecnológicas relacionadas con la primera infancia, discutiremos su valor en la escuela y la familia.

To say that Technology applications related to early childhood is an understatement.

Early childhood is a weapon to improve school life. It is the most important stage for changing future lives. A child's education begins at home.

Technology certainly determines the quality of an individual's early education. Early childhood education improves knowledge, skills and develops personality and attitude of children. Most notably, early childhood technology affects a child's family.

A child with a high level of technological aids increases their developmental capacity.

This monograph on the importance of technology applications related to early childhood will tell you about its value in school and family.

Alcance

El monográfico **Aplicaciones tecnológicas relacionadas con la edad temprana infantil** abordará intervenciones tecnológicas tempranas para niños con necesidades especiales, modelos de atención integral que proporcionan servicios tecnológicos y apoyos de manera holística, abordando las necesidades del niño y su familia de manera coordinada, avances tecnológicos en el diagnóstico precoz con la colaboración de distintos profesionales (médicos, terapeutas, educadores y trabajadores sociales), e investigaciones tecnológicas recientes sobre educación temprana

*The monograph **Technology applications related to early childhood** will address early technology interventions for children with special needs, integrated care models that provide technology services and supports holistically, addressing the needs of the child and family in a coordinated way, technology advances in early diagnosis with the collaboration of different professionals (doctors, therapists, educators and social workers), and recent technology research on early education.*

Descriptores/Líneas Temática

- Modelos tecnológicos para la educación temprana
- Guía para padres y madres sobre edad temprana
- Uso de tecnologías digitales para educación temprana
- Educación informática integrada en tecnología para la primera infancia
- Relación entre los antecedentes de los futuros maestros y el uso de la tecnología en la educación infantil: visión comparada
- Relación entre los antecedentes de los futuros maestros y el uso de la tecnología en la educación infantil: estudio de caso
- Comunicación educador-cuidador a través de la tecnología
- Aplicación tecnológica para la medición del desarrollo infantil: estudio comparado
- Aplicación tecnológica para la medición del desarrollo infantil: estudio de caso
- Revisión de la literatura de naturaleza empírica sobre el uso de la tecnología en la educación temprana
- Tecnología y sostenibilidad en el cuidado de la educación temprana

- El desarrollo artístico en la educación temprana con ayuda de dispositivos tecnológicos
- Los juegos y las actividades dramáticas en la educación temprana
- Mapeo bibliográfico y análisis de contenido en la educación científica de la primera infancia
- Educación tecnológica temprana en países europeos: estudio de caso
- Uso de la realidad virtual (VR), la realidad aumentada (AR) y la realidad mixta (MR) en educación temprana
- De la gamificación a la IA en educación temprana
- Aplicaciones móviles para niños con necesidades educativas especiales.

- *Technology models for early childhood education*
- *Parent's Guide to Early Childhood*
- *Use of digital technologies for early education*
- *Technology-integrated computer education for early childhood*
- *Relationship between prospective teachers' backgrounds and the use of technology in early childhood education.*
- *Educator-caregiver communication through technology.*
- *Technological application for the measurement of child development: a comparative study*
- *Technological application for the measurement of child development: case study*
- *Review of the empirical literature on the use of technology in early education*
- *Technology and sustainability in early childhood education care*
- *Artistic development in early childhood education using technological devices*
- *Games and dramatic play activities in early education*
- *Bibliographic mapping and content analysis in Early Childhood Science Education*
- *Early Technology Education in European countries: a case study*
- *The use of virtual reality (VR), augmented reality (AR) and mixed reality (MR) in early education*
- *From gamification to AI in early education*
- *Mobile applications for children with special educational needs.*

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