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Academic Procrastination Among Peruvian University Students: Its Relationship With the use of Virtual Academic Media, Adaptation to University Life, and Social Media Addiction

Procrastinación académica en universitarios peruanos: Su relación con el uso de medios académicos virtuales, la adaptabilidad a la vida universitaria y la adicción a redes sociales

Procrastinação acadêmica em universitários peruanos: Sua relação com o uso de meios acadêmicos virtuais, a adaptação à vida universitária e a adição às redes sociais

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Abstract

Introduction. The research objective was to determine whether the use of virtual academic media, adaptability to university life, and addiction to social media are associated with academic procrastination in Peruvian university students. **Method.** The design used was predictive and cross-sectional, which allows analyzing relationships at a single point but does not permit causal inferences. 581 university students from public and private institutions in the country were surveyed, mostly between 18 and 25 years old (86.4%), male (57.3%), mainly from private universities (54.0%) and from the mountain region (74.5%). The instruments used were the Scale of Use of Virtual Academic Media, Adaptability to University Life, Addiction to Social Media, and Academic Procrastination. **Results.** The structural model showed an adequate fit to the data (CMIN/DF = 1.031, CFI = 0.960, SRMR = 0.044, RMSEA = 0.037). Social media addiction ($\beta = 0.10$, $p < 0.001$) and adaptability to university life ($\beta = 0.11$, $p < 0.001$) were significantly associated with academic procrastination, whereas the use of virtual academic media was not significant ($\beta = -0.04$, $p > 0.05$). The model explained 9% of the variance in academic procrastination ($R^2 = 0.09$). **Conclusions.** Furthermore, the resulting model showed that adaptability to university life and social media addiction were significantly associated with academic procrastination, whereas the use of virtual academic media was not significantly related.

Keywords: Adaptability to university life; addiction to social media; academic procrastination; university students; use of virtual academic media.

SDG: SDG 3; good health and well-being; SDG 4; quality education.

Resumen

Introducción. El objetivo de la investigación fue determinar si el uso de medios académicos virtuales, la adaptabilidad a la vida universitaria y la adicción a las redes sociales se asocian con la procrastinación académica en estudiantes universitarios peruanos. **Método.** El diseño utilizado fue predictivo y transversal, lo que permite analizar las relaciones en un único momento, pero no permite inferencias causales. Se encuestaron 581 estudiantes de universidades públicas y privadas del país, en su mayoría de entre 18 y 25 años (86,4%), de sexo masculino (57,3%), procedentes principalmente de universidades privadas (54,0%) y de la región de la sierra (74,5%). Los instrumentos utilizados fueron la Escala de uso de medios académicos virtuales, Adaptabilidad a la vida universitaria, Adicción a las redes sociales y Procrastinación académica. **Resultados.** El modelo estructural mostró un ajuste adecuado a los datos (CMIN/DF = 1,031, CFI = 0,960, SRMR = 0,044, RMSEA = 0,037). La adicción a las redes sociales ($\beta = 0,10$, $p < 0,001$) y la adaptabilidad a la vida universitaria ($\beta = 0,11$, $p < 0,001$) se asociaron significativamente con la procrastinación académica, mientras que el uso de medios académicos virtuales no fue significativo ($\beta = -0,04$, $p > 0,05$). El modelo explicó el 9% de la varianza de la procrastinación académica ($R^2 = 0,09$). **Conclusiones.** Además, el modelo resultante mostró que la adaptabilidad a la vida universitaria y la adicción a las redes sociales se asocian significativamente con la procrastinación académica, mientras que el uso de medios académicos virtuales no presentó una relación significativa.

Palabras claves: Adaptabilidad a la vida universitaria; adicción a las redes sociales; procrastinación académica; estudiantado universitario; uso de medios académicos virtuales.

ODS: ODS 3; salud y bienestar; ODS 4; educación de calidad.

Resumo

Introdução. O objetivo desta pesquisa foi determinar se o uso de recursos acadêmicos virtuais, a adaptabilidade à vida universitária e o vício em mídias sociais estão associados à procrastinação acadêmica em estudantes universitários peruanos. **Método.** Foi utilizado um delineamento transversal preditivo, o que permite analisar relações em um único ponto no tempo, mas não possibilita inferências causais. Foram entrevistados 581 estudantes universitários de instituições públicas e privadas do país, a maioria com idades entre 18 e 25 anos (86,4%), do sexo masculino (57,3%), provenientes principalmente de universidades privadas (54,0%) e da região montanhosa (74,5%). Os instrumentos utilizados foram a Escala de Uso de Recursos Acadêmicos Virtuais, a Escala de Adaptabilidade à Vida Universitária, a Escala de Vício em Mídias Sociais e a Escala de Procrastinação Acadêmica. **Resultados.** O modelo estrutural apresentou ajuste adequado aos dados (CMIN/DF = 1.031, CFI = 0.960, SRMR = 0.044, RMSEA = 0.037). O vício em redes sociais ($\beta = 0.10$, $p < 0.001$) e a adaptabilidade à vida universitária ($\beta = 0.11$, $p < 0.001$) estiveram significativamente associados à procrastinação acadêmica, enquanto o uso de recursos acadêmicos virtuais não foi significativo ($\beta = -0.04$, $p > 0.05$). O modelo explicou 9% da variância da procrastinação acadêmica ($R^2 = 0.09$). **Conclusões.** Além disso, o modelo resultante mostrou que a adaptabilidade à vida universitária e a adição às redes sociais estiveram significativamente associadas à procrastinação acadêmica, enquanto o uso de meios acadêmicos virtuais não apresentou associação significativa.

Palavras-chave: Adaptabilidade à vida universitária; vício em redes sociais; procrastinação acadêmica; estudantes universitários; uso de recursos acadêmicos virtuais.

ODS: ODS 3; saúde de qualidade; ODS 4; educação de qualidade.

Introduction

The crisis caused by the COVID-19 pandemic produced significant changes in the educational environment. In universities, the pandemic brought about new formats of education, semi-presential and online (Medina-Ramirez et al., 2022). These changes affected the mental health of the students (Chen & Lucock, 2022) and produced negative psychological reactions (Tian et al., 2023), those related to procrastination.

Academic procrastination is an irrational tendency to delay tasks that should be completed. Evidence in the literature confirms that young people adopt procrastinating behaviors in the academic context (Nemtcan et al., 2022). Previous studies show that academic procrastination increases in online learning environments (Usher et al., 2024). In this sense, understanding why students tend to lag unnecessarily in online learning environments is an important area of research (Cheng et al., 2023). In this sense, the Use of virtual academic media has been conceptualized, which implies the fact of resorting to those digital environments and tools as a complement to the academic and administrative management of the teaching-learning process.



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On the other hand, entering tertiary education is a critical task for new university students, as they will have to deal with various variables such as satisfaction, adaptation, procrastination, and smartphone addiction (Li et al., 2022). The literature reveals that academic procrastination predicts university dropout in the case of students (Garzón Umerenkova & Gil Flores, 2017). In this sense, knowing how adaptability to university life affects academic procrastination is essential, conceptualized as a process of adjustment to a new mode of development.

Finally, social media addiction is a global phenomenon that affects university students and is directly related to procrastination behavior (Liu, 2023). On the other hand, research on college students confirmed that academic procrastination acted as an important mediator along with smartphone addiction between the inability to stay focused and planning academic tasks (Hamvai et al., 2023). In this study, social media addiction is defined as excessive internet use that is related to a personality imbalance, impulsiveness, obsessive ideas, anxiety, and activities that impact important areas of our lives (Salas-Blas et al., 2020).

It is important to distinguish the conceptual clarity of the constructs in this study. Satisfaction is related to the degree or positive evaluation a student has regarding their environment and academic achievement (Li et al., 2022). Adaptation to university life involves a process of adjusting to the academic, institutional, and social demands of the university context (Rodríguez-Ayan & Sotelo, 2014). Social media addiction reveals a pattern of excessive use of technologies such as smartphones, which allows a student to be constantly connected, hindering their academic and daily functioning (Liu, 2023; Salas-Blas et al., 2020). Finally, academic procrastination is the tendency to postpone academic tasks and the loss of control on the part of the student (Nemtcan et al., 2022).

Under the self-determination theory (Deci & Ryan, 1985), it is postulated that a person who perceives himself as competent, autonomous, and related is self-regulated, and the lack of satisfaction with these basic psychological needs tends to increase procrastinating behavior. In this sense, it is important to understand the predictive factors of procrastination in Peruvian university students. The explanatory mechanism from self-determination theory shows that academic behavior can be explained based on how students satisfy their needs for autonomy, competence, and relatedness. In this sense, adaptability to university life reflects the capacity for competence and the establishment of meaningful social relationships, while the use of virtual academic tools can either support or hinder autonomy depending on the structure of learning activities. Social media addiction can diminish the capacity for autonomy and self-regulation by promoting compulsive behaviors. Therefore, adequate adaptation to university life allows for the development of self-regulation strategies, reducing the tendency to procrastinate (Zhang et al., 2023). On the other hand, social media addiction interferes with self-regulation processes, decreases concentration, and hinders the completion of academic assignments (Hamvai et al., 2023; Liu, 2023). Likewise, the use of virtual academic tools could facilitate improved learning, but ambivalently, it can also create contexts that encourage distraction and the postponement of tasks (Jiang, 2021; Touloupis & Campbell, 2024). Taken together, these constructs contribute to a scenario where levels of self-regulation determine the procrastinating behavior of university students.

Literature review

Studies on academic procrastination concerning the variables raised show a relationship between addiction to social media and academic procrastination in students of Peruvian public institutions. Another study shows that the greater the addiction to social media, the greater the procrastination behavior (Suárez-Perdomo et al., 2022). Another study on 1,255 students reported that social media addiction and academic procrastination had a high and significant relationship (Yana-Salluca et al., 2022). The study on Internet addiction showed that programs that help control Internet addiction tend to modify motivational and procrastination factors.

On the other hand, reports on first-year university students show a relationship between procrastination and a more significant decrease in grades, considering procrastination as a risk factor in students who adapt from secondary to university level (Reić Ercegovic et al., 2021). Another study reported in 249 French students that 30% of the variance in procrastination was associated with avoidance and lack of regulation (Martinie et al., 2023).

Regarding studies between virtuality and procrastination. Prior online learning experience was reported to have no significant or direct association with academic procrastination (Cheng et al., 2023). Another study showed that students procrastinated more in the online learning environment than in the face-to-face one (Sun & Kim, 2023). The study of online classes during the COVID-19 pandemic showed that both academic and non-academic factors in online classes reduce academic procrastination. These discrepancies in these studies are explained by the influence of contextual and moderating variables. Factors such as the quality of the instructional design of the virtual environment and the presence of academic support can modify the relationship between online learning and procrastination (Broadbent & Poon, 2015). Similarly, a student's lack of self-directed learning strategies can negatively impact time management (Cheng et al., 2023). Likewise, contexts with a lack of supervision can promote procrastination (Sun & Kim, 2023). The relationship between virtuality and procrastination is not linear but depends on the conditions under which the teaching and learning process takes place.

These investigations show the need to develop predictive studies that show how virtual academic media, adaptability to university life, and addiction to social media predict academic procrastination. Furthermore, it is important to analyze academic procrastination because it leads to negative psychological consequences such as discomfort (Wu et al., 2024). Approximately half of the student population is affected by this problem, and many recognize the harmful nature of procrastinating behavior.

Current literature continues to explore the relationship between the use of digital technologies and academic procrastination. The study by Chavez-Yacolca et al. (2024) reports that internet and social media addiction is significantly associated with higher levels of academic procrastination, with self-efficacy acting as a mediating factor. Another study shows that internet addiction explains a significant proportion of the variance in academic procrastination (Lunahuana Rosales, 2025). Furthermore, recent research suggests that this relationship could



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be influenced by psychological factors such as self-control or the perception of future time, which can either mitigate or enhance the effects of social media addiction on procrastination (Avci et al., 2024). On the other hand, emotional regulation and age may play a moderating role in this relationship (Fuentes-Chavez et al., 2025).

The research objective was to determine whether the use of virtual academic media, adaptability to university life, and addiction to social media are associated with academic procrastination in Peruvian university students.

Hypothesis

Given the study's objective and the reviewed theoretical evidence, the following hypotheses were proposed:

H1: The use of virtual academic resources is significantly associated with academic procrastination in Peruvian university students.

H2: Adaptability to university life is significantly associated with academic procrastination in Peruvian university students.

H3: Social media addiction is significantly associated with academic procrastination in Peruvian university students.

Methodology

Design

This study follows the guidelines of a cross-sectional predictive design because it allows for the analysis of the predictive capacity of the dependent variables and because the data are collected at a single point in time. The structural model was specified based on previous theoretical literature, considering academic procrastination as the dependent variable and the use of virtual academic resources, adaptability to university life, and social media addiction as predictor variables. Direct relationships were proposed between each of these variables and academic procrastination, in accordance with the formulated hypotheses. The model was estimated using structural equation modeling with the maximum likelihood method, and its fit was evaluated using goodness-of-fit indices such as CMIN/DF, CFI, SRMR, and RMSEA.

Sample design

Through non-probabilistic convenience sampling, 581 university students enrolled in private and public universities in Peru were voluntarily surveyed. Among the inclusion criteria

were taken to be enrolled university students of Peruvian nationality, over 17 years of age, and who reside in Peru. University students under 17 years of age and those who did not consent and were of foreign nationality were excluded.

Due to the non-probability and voluntary sampling method, self-selection bias is likely, as students with greater interest in the topic may have been more probable to participate. Therefore, the generalizability of the results is approached with caution, and external validity is specifically limited to the population of university students with similar sociodemographic characteristics.

Data collection techniques

Data collection was carried out in coordination with authorities and teachers, and a schedule of visits to university students, where the study's objective was presented, and their voluntary participation was requested. The data was taken virtually. In the first part of the questionnaire, informed consent and approval for future publication were presented.

The instrument used was the Virtual Academic Media Use Scale. Mamani-Benito et al. (2021) designed and validated (Mamani- Benito et al., 2021) the brief scale. It comprises 10 items distributed in two factors, aiming to measure the virtual classroom environments this Coronavirus pandemic has generated. The format of the items is Likert-type, with response options that report agreement or disagreement with the statements, from totally disagree to totally agree. Example items include: *I consider the use of virtual platforms necessary for studying* and *I find it difficult to adapt to the use of virtual platforms for my classes*. Regarding its psychometric properties, confirmatory factor analysis was performed, where the goodness of fit indices were satisfactory ($\chi^2 = 24.204$, $df = 13$; $p = 0.001$; $RMR = 0.058$; $CFI = 0.931$; $TLI = 0.908$; $GFI = 0.957$; $AGFI = 0.931$ and $RMSEA = 0.071$), also, the correlation between factors 1 and 2 was significant ($p < 0.05$) and the reliability was good ($\alpha = 0.74$; 95% CI = 0.70 - 0.77). Factor 1 (Use of virtual media) explains 37.65% of the variance and is made up of items 1, 2, 3, 5, 6, and 7, with saturations greater than .40, and Factor 2 (Support in learning) contributes 17.62% of the variance and is made up of items 4, 8, 9, and 10, with saturations greater than .42.

Adaptability to university life. It was adapted by Rodríguez-Ayan and Sotelo (2014) and consists of 11 items distributed in three dimensions, which aim to understand the degree of adaptation of students during their stay at the university. The format of the items is Likert-type. Example items include: *I have been able to make new friends at the university* and *I have a clear understanding of the concepts I need to learn in my courses*. Regarding its psychometric properties, the exploratory factor analysis yielded a three-factor solution that explains 55.4% of the variance. In addition, the internal consistency indices yield adequate values ($\text{Alpha} > .77$), and the content-based validity was also adequate. Three dimensions. Social dimension, items 1 to 5; institutional dimension, items 6, 7 and 8; academic dimension, items 9, 10 and 11, $X^2/df = 2.25$; $GFI = .956$; $AGFI = .931$; $NFI = .890$; $IFI = .936$; $CFI = .935$ and $RMSEA = .0589$, 90% CI (.043, .075). The instrument had good psychometric properties.



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Social media Addiction It will be measured with the Social Media Addiction Questionnaire (ARS-6), built and validated by [Escurre Mayute and Salas Blas \(2014\)](#), adapted in a short version by [Salas-Blas et al. \(2020\)](#) and validated in the Latin American context by [Salas-Blas et al. \(2022\)](#). This questionnaire contains 6 items, with five Likert-type response options, from *never* to *always* (0 to 4 points). Example items include: *The time I spend on social media is no longer enough for me, and I need more* and *I feel upset if I cannot connect to social media*. The single-factor model proposes that addictions have six components (salience, mood swings, tolerance, withdrawal, conflicts, and relapse). It has psychometric properties of validity and reliability (Reliability w 0.91).

Academic procrastination. The EPA validated for Peruvian university students was used by [Dominguez Lara et al. \(2014\)](#), comprising 12 items, with Likert-type response options: 1 = never, 2 = rarely, 3 = sometimes, 4 = often, and 5 = always. The scale proved to be valid (CFI = 1, GFI = .97, and RMSEA = .078) and reliable (α = .81). Factor 1 is academic self-regulation (2,3,4,5, 8,9,10,11, and 12), and factor 2 is activity postponement (1,6, and 7). Example items include: *When I have to do a task, I usually leave it until the last minute* and *I postpone assignments from courses I do not like*.

Statistical Techniques for Information Processing

Different statistical analyses were conducted to examine the data developed through the IBM SPSS statistical program for Windows version 26.0. First, descriptive statistics such as mean, standard deviation, skewness, and kurtosis were calculated. Concerning the data's normality, criterion points out that the asymmetry must be less than 3 and the kurtosis no greater than 10 for a typical data distribution. Secondly, the assumption of linearity was previously analyzed using Pearson correlation analysis, considering the proposed magnitude of the effect of Ferguson, where scores between .20 and .50 are low, between .50 and .80 are moderate, and greater than .80 are strong. Thirdly, the independence of errors was analyzed through the Durbin-Watson statistic, multicollinearity, taking into account the variance inflation factor (VIF) values. A multiple linear regression analysis was also performed. Finally, to determine whether or not the independent variables explain the level of the dependent variable, the structural equation modeling software AMOS version 26.0 will be used.

Ethical aspects

The study was approved by the Ethics Committee of the Graduate School of the Peruvian Union University (approval code: 2024-CE-EPG-00047). Fundamental ethical principles were guaranteed throughout the research process. Participation was voluntary, and all participants provided their informed consent prior to data collection. Confidentiality and anonymity were ensured, preventing the collection of data that could identify participants and using the information exclusively for academic and research purposes. Participants were informed about the study's objectives, their right to withdraw at any time without consequence, and the use of their data for scientific publication. The study was conducted in accordance with the ethical principles for research involving human subjects established in the Declaration of Helsinki.

Result

Table 1 shows that 86.4% are between 18 and 25 years old, 57.3% are men, 40.1% are from the Faculty of Business, and 32.4% are from the Faculty of Engineering and Architecture. 54% are from private universities, 74% come from the Mountain, and 94% have face-to-face classes.

Table 1: Sociodemographic information

	(n = 581)	n	%
Age	18-25	502	86.4%
	26-35	65	11.2%
	36 or more	14	2.4%
Sex	Female	248	42.7%
	Male	333	57.3%
Faculty to which it belongs	Faculty of Health Sciences	30	5.2%
	Faculty of Business Sciences	233	40.1%
	Faculty of Human Sciences and Education	24	4.1%
	Faculty of Engineering and Architecture	188	32.4%
	Faculty of Theology	2	0.3%
	Other faculties	104	17.9%
University of origin	Private	314	54.0%
	Public	267	46.0%
Origin	Coast	124	21.3%
	Jungle	24	4.1%
	Mountain	433	74.5%
Study modality	Face-to-face	546	94%
	Blended	35	6.0%

Note: Own elaboration.

The data analysis is presented in Table 2. The mean and standard deviation are observed, the asymmetry coefficient is within the expected ± 1.5 , and the correlations between 0.078 and 0.463 for the variables studied are presented. Additionally, internal consistency is observed through the Cronbach Alpha coefficient, which had results between 0.72 and 0.92.

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Table 2: Descriptive statistics, internal consistency, and correlations of the study variables

	M	SD	A	K	α	1	2	3	4
UMAV (1)	22.35	5.62	-0.29	0.15	0.85	1			
ARS (2)	12.26	4.85	0.69	-0.20	0.9	.118**	1		
AVU (3)	21.49	7.28	0.37	-0.29	0.72	.463**	.251**	1	
EPA (4)	37.42	10.35	-0.99	0.33	0.92	.291**	0.078	.084*	1

M: Mean, SD: Standard deviation, A: Skewness, α : Cronbach's alpha. UMAV: Use of Virtual Academic Media; ARS: Social Media Addiction; AVU: Adaptability to University Life; EPA: Academic Procrastination.

Note: Own elaboration.

Table 3: Goodness-of-Fit Indices

Measure	Estimate	Threshold	Interpretation
CMIN	60.829		
DF	59		
CMIN/DF	1.031	Between 1 and 3	Acceptable
CFI	0.960	>0.95	Acceptable
SRMR	0.044	<0.08	Acceptable
RMSEA	0.037	<0.06	Acceptable

CMIN = Chi-square; DF = Degrees of freedom; CMIN/DF = Normed chi-square; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation. Threshold values are based on commonly accepted criteria in structural equation modeling.

Note: Authors' own elaboration.

Table 4: Hypothesis Testing

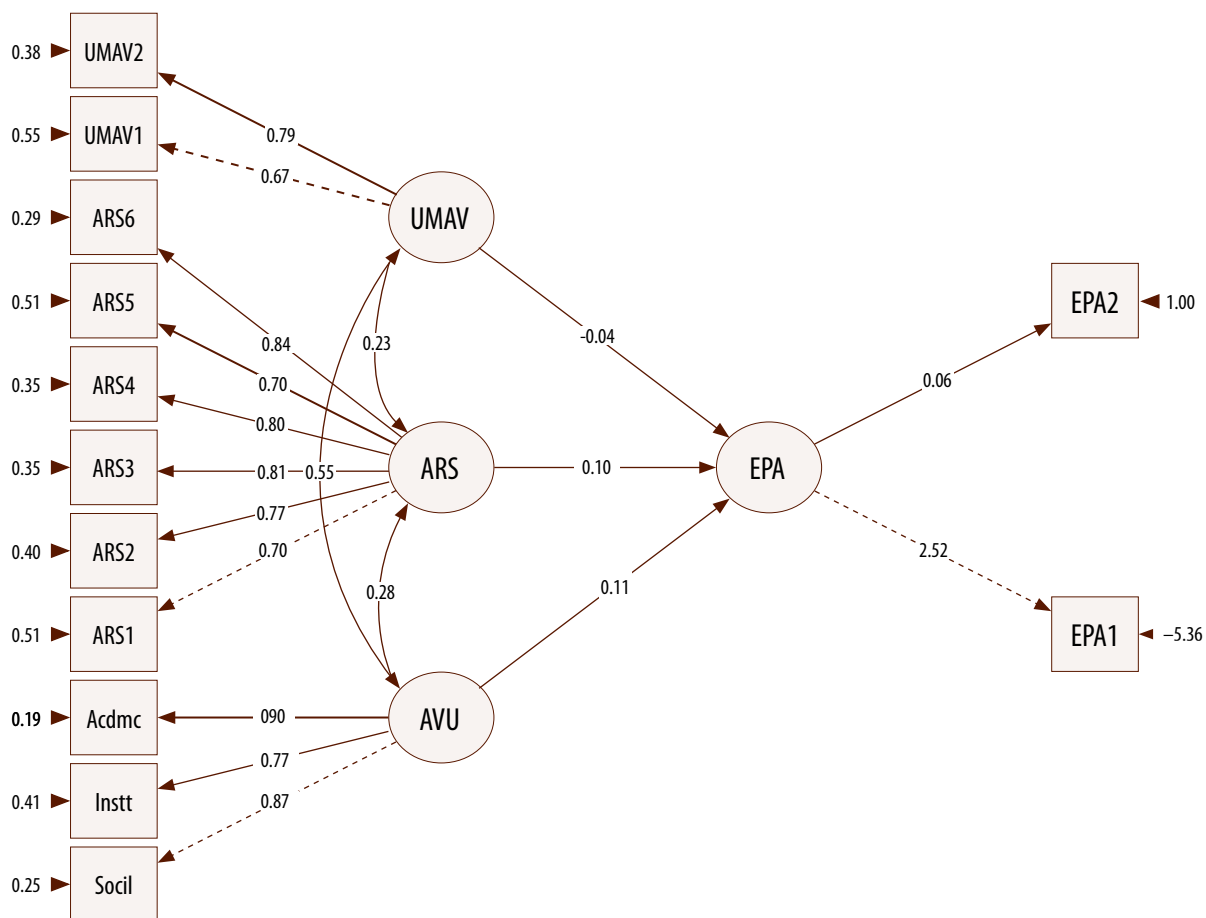
Variable	Path Coefficient	p-value	Decision
UMAV --> EPA	-0.04	>0.5	Rejected
ARS --> EPA	0.10	***	Accepted
AVU --> EPA	0.11	***	Accepted

UMAV = Use of Virtual Academic Media; ARS = Social Media Addiction; AVU = Adaptability to University Life; EPA = Academic Procrastination. *** $p < .001$.

Note: Authors' own elaboration.

The structural model (Figure 1) showed an adequate fit to the data, as evidenced by the obtained goodness-of-fit indices: CMIN/DF = 1.031, which falls within the recommended range of 1 to 3; CFI = 0.960, exceeding the threshold of 0.95; SRMR = 0.044, below the reference value of 0.08; and RMSEA = 0.037, which is below the acceptable limit of 0.06. These results indicate that the proposed model adequately reproduces the observed covariance matrix. Regarding the structural relationships, it was found that the UMAV variable did not show a significant association with EPA ($\beta = -0.04$, $p > 0.05$), and therefore this hypothesis was rejected (Tables 3 and 4). In contrast, the paths from ARS to EPA ($\beta = 0.10$, $p < 0.001$) and from AVU to EPA ($\beta = 0.11$, $p < 0.001$) were statistically significant, confirming the proposed hypotheses. Figure 1 presents the final structural model with the corresponding standardized coefficients. The model explained 9% of the variance in academic procrastination ($R^2 = 0.09$).

Figure 1: Structural model



Note: Authors' own elaboration.

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Discussion

Academic procrastination represents a personal, systemic, and substantial problem. This phenomenon can impact the academic area, causing students to delay the start or completion of their activities (Uma et al., 2020), in addition to being considered a time management problem and denaturalization of the importance of delivering academic reports on time (Álvarez Blas, 2010). The research objective was to determine whether the use of virtual academic media, adaptability to university life, and addiction to social media predict academic procrastination in Peruvian university students.

Regarding Hypothesis 2, The findings found in this research show that adaptability to university is associated with academic procrastination. This means that students who are highly adapted to university life also show high levels of academic procrastination. Recent studies show adaptability is related to academic procrastination (Zhang et al., 2023). Students more motivated by their social, institutional, and academic environment tend to create conditions to overcome learning difficulties (Chen et al., 2021). Students with high adaptability are more likely to integrate into their environment, adapt to new tasks, and achieve their goals. These students are also less likely to procrastinate on academic tasks (Zhang et al., 2023). Other studies also confirmed that adaptability has a close relationship with low academic procrastination and that negative adaptability has a high relationship with academic procrastination. The university teaching model is different and more complex, so the student must adapt to this model to avoid academic failure.

Regarding Hypothesis 3, social media addiction is related to academic procrastination, although the cross-sectional design does not allow establishing causal directionality. This result is similar to that reported by Kurker and Surucu (2024), who found that social media addiction was related to procrastination. Addicted people tend to give up their responsibilities in their lives to use social media and, therefore, fail to fulfill their responsibilities. Addicted people who spend excessive time on social media cannot devote time to academic studies, work, and other activities (Kuss & Griffiths, 2011).

It is important to consider the magnitude of the effects found in the structural model. While the relationships between social media addiction ($\beta = 0.10$) and adaptability to university life ($\beta = 0.11$) with academic procrastination yielded significant results, their effect sizes are small, suggesting that these variables explain only a limited part of the phenomenon. Therefore, academic procrastination should be understood as a multifactorial construct affected by various contextual and personal variables not included in the model.

On the other hand, there are differences between the bivariate correlations and the structural effects. While the initial correlations showed positive associations between the variables, in the structural model some relationships lost significance, such as that of the variable *use of virtual academic resources*. This difference is explained by the fact that the structural model simultaneously controls the effect of the other variables and identifies the unique contribution of each factor. In that sense, some relationships observed at the bivariate level may be influenced by shared variables or indirect effects that are adjusted in the multivariate model.

Another relevant finding of this study in relation to hypothesis 1 is that the use of virtual academic resources did not show a significant association with academic procrastination. In the university context, students carry out activities in virtual environments, which facilitates access to learning but can generate some problematic situations such as the excessive use of digital tools (Jiang, 2021). While some studies show that virtual learning favors procrastination (Touloupis & Campbell, 2024), the results of this research suggest that this relationship is not significant. This could be explained by the presence of moderating or contextual variables such as the level of self-regulation, academic support, or the virtual instructional design itself, which condition the effect of virtual learning on procrastinating behavior (Broadbent & Poon, 2015).

The results of this study should be interpreted within the context of the inconsistencies reported in the literature on procrastination and digital environments. Some studies indicate that online learning increases procrastination (Sun & Kim, 2023; Usher et al., 2024), other studies show no association (Cheng et al., 2023), and some research suggests that the relationship between procrastination and digital environments depends on psychological variables such as self-efficacy, emotional regulation, or self-control (Avci et al., 2024; Chavez-Yacolca et al., 2024).

Based on the theory of determination (Deci & Ryan, 1985), the effect of the virtual environment depends on the degree to which it fosters autonomy, competence, and relationships. In an environment where academic support and instructional design promote self-regulation, virtuality cannot increase procrastination (Touloupis & Campbell, 2024). A person who adapts to university life, and who controls social media may be better positioned to develop strategies to cope with academic procrastination. In this sense, these findings suggest that academic institutions could consider intervention strategies that consider these variables to reduce students' levels of academic procrastination. It is also necessary to propose policies to help students improve their adaptation processes to university life and programs to control and prevent addiction to social media.

This research has some limitations. First, the study employed a cross-sectional design, which does not allow establishing causal relationships or determining the directionality of the associations observed. Therefore, the findings should be interpreted as associations rather than causal effects. Second, due to convenience and volunteers, the sample was non-probabilistic, so it is necessary to develop similar studies with stratified probability sampling. Third, data collection was virtual, and there are likely differences that do not allow generalizations compared to face-to-face data collection. Finally, the study was self-reported, so the results should be cautiously taken.

Conclusion

This research is an important contribution to the literature on academic procrastination and provides strategies for institutions to intervene, considering the variables studied here. The results showed that adaptability to university life ($\beta = 0.11$) and social media addiction ($\beta = 0.10$) were significantly associated with academic procrastination in Peruvian university students; however, the magnitude of these effects was small, suggesting that these variables explain only a limited portion of procrastination. In contrast, the use of virtual academic resources did



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not show a significant association. Overall, the model explained a modest proportion of the variance in academic procrastination ($R^2 = 0.09$), which reinforces its multifactorial nature.

From a theoretical perspective, these findings are consistent with self-determination theory, demonstrating that factors related to adaptation and problematic use of social media can influence self-regulation processes, affecting academic performance. In this sense, academic procrastination should be understood as a complex phenomenon, influenced by personal and contextual variables. Therefore, it is suggested that educational institutions promote strategies aimed at strengthening adaptation to university life and regulating social media use, as part of comprehensive interventions to reduce academic procrastination.

Author Contributions

The authors declare they have contributed in the following roles:

O. L. Q. F.: Conceptualization; Investigation; Methodology; Validation; Writing draft; Review & Editing.

M. H. G.: Investigation; Methodology; Validation; Writing draft.

S. R. H. L.: Conceptualization; Analysis; Methodology; Review & Editing.

J. E. T. C.: Conceptualization; Investigation; Methodology; Supervision; Writing draft; Review & Editing.

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Artificial Intelligence Declaration

The authors do not disclose the use of artificial intelligence for writing the article or for creating its content.

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