

Engagement, academic burnout, and academic procrastination among students of a public university

Engagement, burnout académico y procrastinación académica en estudiantes de una universidad estatal

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Abstract

The mediating role of engagement was analyzed with respect to the relationships between the dimensions of academic burnout and academic procrastination in students of a state university in Metropolitan Lima. A confirmatory design of theoretical models was used. A total of 1058 university students participated, obtained through non-probabilistic sampling by quotas. The Academic Engagement Questionnaire (SAE), the Maslach Burnout Inventory for Students (MBI-SS) and the Academic Procrastination Scale (EPA) were used, in which evidence of validity and reliability was provided by internal consistency. The results using the structural equation model show that the dimensions of academic burnout in its relationship with academic procrastination are modified as a result of the mediation of engagement, in specific cases. In particular, there was no statistically significant effect of engagement mediation on the relationship between emotional exhaustion and academic procrastination ($B = -.012$, $SE = .016$, $CR = -.705$, $p = .481$; $\beta = -.014$). However, an important partial mediation of engagement was found in the relationship between academic competence and academic procrastination ($B = .794$, $SE = .025$, $CR = 31.170$, $p < .001$; $\beta = .782$), with a large effect size observed in this case. Likewise, engagement was found to play a partial mediating role in the relationship between cynicism and academic procrastination ($B = -.135$, $SE = .016$, $CR = -8.276$, $p < .001$; $\beta = -.194$), with an effect size between small and medium.

Keywords: Engagement, academic burnout, academic procrastination, students, state university

Resumen

Se analizó el rol mediador del engagement con respecto a las relaciones entre las dimensiones del burnout académico con la procrastinación académica en estudiantes de una universidad estatal de Lima Metropolitana. Se empleó un diseño confirmatorio de modelos teóricos. Participaron 1058 universitarios, obtenidos mediante un muestreo no probabilístico por cuotas. Se utilizó el Cuestionario de Compromiso Académico (SAE), el Inventario de Burnout de Maslach para Estudiantes (MBI-SS) y la Escala de Procrastinación Académica (EPA), en los cuales se aportaron evidencias de validez y confiabilidad por consistencia interna. Los resultados utilizando el modelo de ecuaciones estructurales muestran que las dimensiones del burnout académico en sus relaciones con la procrastinación académica son modificadas producto de la mediación del engagement, en casos específicos. De manera particular, no hubo un efecto estadístico significativo de la mediación del engagement en la relación entre el agotamiento emocional y la procrastinación académica ($B = -.012$, $SE = .016$, $CR = -.705$, $p = .481$; $\beta = -.014$). Sin embargo, se encontró una importante mediación parcial del engagement en la relación entre la competencia académica y la procrastinación académica ($B = .794$, $SE = .025$, $CR = 31.170$, $p < .001$; $\beta = .782$), observándose en este caso un tamaño del efecto grande. Asimismo, se halló que el engagement cumple un rol mediador parcial en la relación entre el cinismo y la procrastinación académica ($B = -.135$, $SE = .016$, $CR = -8.276$, $p < .001$; $\beta = -.194$), con un tamaño del efecto entre pequeño y mediano.

Palabras clave: Engagement, burnout académico, procrastinación académica, estudiantes, universidad estatal

INTRODUCTION

Engagement is an affective-emotional state of fulfillment characterized by three dimensions: vigor, dedication, and absorption or concentration at work (Maslach & Leiter, 1997). University students set academic goals for themselves; to achieve them, they require academic engagement in both their tasks and learning activities to acquire and develop new skills and knowledge (Zárate *et al.*, 2019). For Abad (2019), it is a state in which the student's sense or degree of well-being is high when facing an academic challenge. Achieving this engagement is a complex task for university students, as they must face new experiences that generate pressure, anxiety, and stress (Hinrichs *et al.*, 2016).

According to Maslach and Leiter (1997), the concept of engagement is the opposite of burnout. Diverse studies, such as those by Martínez and Salanova (2003), Salanova *et al.* (2000, 2005, 2010), and Schaufeli *et al.* (2002a), have shown that academic tasks can generate academic burnout and that students with high levels of burnout feel exhausted by the demands of studying (emotional exhaustion), display a cynical and distant attitude toward their studies (cynicism), and feel ineffective as students (efficacy) (Parra, 2010). Caballero *et al.* (2010) point out that students experiencing academic burnout present the following symptoms simultaneously: they feel they can no longer give more of themselves either physically or psychologically, hold a negative attitude of criticism, devalue themselves, lose interest in studying, and doubt their ability to study. Studies such as those by Caballero *et al.* (2015a, 2015b) and Liébana-Presa *et al.* (2018) provide empirical evidence of the negative relationships between engagement and academic burnout.

Regarding academic procrastination, Ferrari *et al.* (1995) and Ferrari and Díaz-Morales (2007) define it as a cognitive and behavioral pattern related to the intention to perform a task and a lack of diligence in initiating, developing, and completing it. This process is reportedly accompanied by the experience of anxiety, restlessness, or dejection. Sénécal *et al.* (2003) point out that individuals who procrastinate in the educational setting tend to postpone academic tasks when the deadline is very close; likewise, they engage in very few activities and avoid assuming responsibilities in group work.

Steel (2007) considers academic procrastination to be an especially severe behavioral pattern that produces consequences for the student, as well as their academic and family environments. Ferrari *et al.* (1995) explain that procrastination may occur because students, despite intending to perform an academic activity within the established timeframe, do not feel motivated or lack the desire to do so because the task causes them aversion. Currently, many university students show a tendency to delay submitting assignments, which is considered academic procrastination (Alegre, 2013; Angarita, 2012; Quant & Sánchez, 2012), causing difficulties in their learning process and academic performance. Quant and Sánchez (2012) highlight the existence of studies showing a significant relationship between procrastination and low school performance, as well as a significant relationship between academic procrastination and personal stress in university students, such as research by Takács, Landry and Cabrera, Bethencourt, González and Álvares, among others.

In the thematic review, only one study was found regarding the mediating role of academic emotional exhaustion and academic engagement in the influence of academic self-efficacy on university adaptation; however, based on the aforementioned correlational studies, the mediating role of engagement in the relationships between academic burnout and academic procrastination could be inferred.

From the foregoing, the following research question arises: In what way does engagement act as a mediator in the relationships between the dimensions of academic burnout and academic procrastination in students from a public university in Metropolitan Lima?

Therefore, the general objective of this study is to analyze the mediating role of engagement regarding the relationships between the dimensions of academic burnout and academic procrastination in students from a public university in Metropolitan Lima.

The specific hypotheses are as follows:

H_{1.1}: Engagement acts as a mediator in the relationship between emotional exhaustion and academic procrastination.

H_{1.2}: Engagement acts as a mediator in the relationship between academic efficacy and academic procrastination.

H_{1.3}: Engagement acts as a mediator in the relationship between cynicism and academic procrastination.

Regarding international research, the study by Caballero *et al.* (2015b) is reported, who examined the interdependence between academic burnout and academic engagement in healthcare university students, further characterizing this relationship through its associations with sociodemographic variables and academic performance. The sample consisted of 802 students from medicine, nursing, physical therapy, and psychology programs from private universities in Barranquilla, Colombia. They used the MBI-SS, the UWES-S, and a questionnaire on socioeconomic and academic conditions. The results showed that academic burnout and academic engagement were extremes of the same continuum or factor. The academic burnout was a strong predictor of poor academic performance, whereas academic engagement was a strong predictor of good academic performance.

Caballero *et al.* (2015a) studied the relationship between burnout and engagement with anxiety, depression, and academic achievement in healthcare university students, with 802 students from universities in Barranquilla, Colombia, participating. The MBI-SS, UWES-S, STAI, and Beck Depression Inventory were administered. They concluded that academic burnout and engagement were identified as extreme and opposite poles of the same multidimensional continuum. Low levels of engagement were related to high levels of burnout, depression, trait and state anxiety, and academic inefficacy. High levels of engagement were related to good academic achievement, low academic inefficacy, low depression, and low trait and state anxiety.

Vizoso and Arias (2016) investigated the relationship between engagement, burnout, and academic achievement in university students and its connection to career choice priority. Participants included 499 students from the University of León, Spain. They employed the Spanish versions of the Maslach Burnout Inventory–Student Survey (MBI-SS) and the Utrecht Work Engagement Scale–Student (UWES-S) as instruments. They reported that students enrolled in the program they chose as their first option exhibited higher levels of engagement and academic achievement.

Tortul and Schönfeld (2017) studied the relationship between self-efficacy and academic engagement in high school students. The sample was made up of 303 high school students from Entre Ríos, Argentina. The Argentine adaptation for students of the Utrecht-Work Engagement Scale (UWES) and the O’Sullivan Self-Efficacy Scale were applied. They found significant correlations between self-efficacy and each of the dimensions of engagement (vigor, dedication, and absorption). Likewise, they reported that academic self-efficacy was a significant predictor of academic engagement.

Liébana-Presa *et al.* (2018) studied the relationship between academic burnout and engagement in nursing students. A total of 1,009 students from the four public universities of Castilla y León, Spain, participated. The instruments used were the student versions of the Maslach Burnout Inventory and the Utrecht Work Engagement Scale. Significant and inverse relationships were found between academic efficacy and emotional exhaustion, and between academic efficacy and cynicism, as well as significant correlations between academic efficacy and each of the dimensions of academic engagement.

Zárate *et al.* (2019) studied engagement in first-year dental university students. The sample consisted of 145 students from the Autonomous University of Sinaloa, Mexico. The UWES (Utrecht Work Engagement Scale) was applied. They found that most students were engaged, as they achieved high scores on the scale, with the dedication dimension obtaining the highest scores, showing that students were enthusiastic, inspired, and proud of their profession. Furthermore, they displayed energy toward their studies and enjoyed their academic activities.

Several studies have been conducted in Peru. For example, Delgado *et al.* (2015) examined the relationship between burnout and engagement among students from a public and a private university in Metropolitan Lima. The sample consisted of 1,040 university students. They administered the Maslach Burnout Inventory Student Survey (MBI-SS) by Schaufeli *et al.* and the Spanish version of the Student Academic Engagement (SAE) Questionnaire by Schaufeli *et al.* They reported the existence of negative and statistically significant correlations between the emotional exhaustion and cynicism dimensions of burnout and the dimensions of engagement,

as well as positive and statistically significant correlations between the competence (efficacy) dimension of burnout and the dimensions of engagement.

Sulio (2018) investigated academic procrastination and academic performance in penultimate-year psychology university students in Arequipa. Participants included 120 students in their penultimate academic year, to whom the Academic Procrastination Scale (APS) was applied, and their 2017 weighted grade point average was obtained. He reported that the students presented moderate levels of academic procrastination. A significant and negative relationship was found between academic procrastination and academic performance. Likewise, significant and inverse relationships were found between the dimensions of academic procrastination (academic self-regulation and postponement of activities) and academic performance. Male students reached higher levels of procrastination.

Abad (2019) conducted a study on academic procrastination, burnout, and academic engagement in students from a private university in Lima, involving 156 university students. The Academic Procrastination Scale (EPA), the Academic Engagement Scale (UWES-17), and the Academic Burnout Scale (MBI-SS) were used. He concluded that there was a direct and significant relationship between academic procrastination and academic burnout, and an inverse and significant relationship with academic engagement; this indicates that higher academic procrastination and academic burnout are associated with lower academic engagement in students, and vice versa.

Reyes (2019) studied the relationship between academic procrastination and academic engagement in law students from a private university in Trujillo. A total of 316 university students from the first to the twelfth semester participated. He used Busko's Academic Procrastination Scale and the student version of the Engagement Scale (UWES-S) by Schaufeli et al. He concluded that there was a negative and significant relationship between academic procrastination and academic engagement. Likewise, he found a negative and significant relationship between the dimensions of both variables.

Palacios-Garay *et al.* (2020) investigated the relationship between procrastination and academic stress on academic engagement in 181 students from the Faculty of Education in their III, V, and VII semesters. The Procrastination Assessment Scale-Students (PASS) by Solomon and Rothblum, the SISCO by Barraza, and the UWES-Student by Salanova, Bresó, and Schaufeli were administered. They reported that procrastination and academic stress significantly influenced students' academic engagement; likewise, procrastination and academic stress significantly influenced the vigor, dedication, and absorption dimensions of academic engagement.

Belito (2020) conducted a study on the relationship between procrastination and academic stress on academic engagement among education students from Federico Villarreal University. Participants included 181 students from the Faculty of Education in their III, V, and VII semesters. The instruments used were the PASS (Procrastination Assessment Scale-Students) by Solomon and Rothblum, the SISCO by Barraza, and the UWES-Student by Salanova, Bresó, and Schaufeli. He concluded that a significant relationship existed among the study variables, and that procrastination and academic stress influenced academic engagement, as well as each of its dimensions.

Cruz and Da Silva (2024) reported a direct relationship between academic procrastination and emotional exhaustion in university students from Northern Lima, concluding that high levels of academic procrastination were associated with an increase in emotional exhaustion.

METHOD

Research Design

The study is non-experimental and cross-sectional, as variables were not manipulated and measurements were taken at a single point in time (Ato *et al.*, 2013; Hernández-Sampieri & Mendoza, 2023). The study design can be considered a confirmatory design of theoretical models, given that the model is adequate and the fit indices provide information regarding the statistical plausibility of the model, rather than causal relationships (Byrne, 2016; Hayes, 2018; Kline, 2023).

Participants

The population consisted of 26,497 students from a public university in Metropolitan Lima. The sample size was determined by taking the characteristics of the population into account. The sample was obtained using non-probability, quota, and purposive sampling; subsequently, the proportion of students per Faculty was established -maintaining the population proportion- thereby preventing any bias. The participants were purposively selected upon entering their virtual classrooms, requesting the participation of those who met the inclusion criteria.

The following were considered inclusion criteria:

- Students with regular enrollment status.
- Being 18 years of age or older.

The exclusion criteria were as follows:

- Students without regular enrollment status.
- Being a minor.

The final sample size was 1,058 students.

Instruments

The instruments applied were the following:

1. The Student Academic Engagement (SAE) Questionnaire by Schaufeli and Bakker (2003), translated by Valdez and Ron (2011).

The questionnaire consists of 15 items comprising three dimensions: vigor, dedication, and absorption, with 5 items per dimension. The response scale is a 7-point Likert-type scale, ranging from 0 (Never) to 6 (Always) (Valdez & Ron, 2011).

2. The Maslach Burnout Inventory-Student Survey (MBI-SS) by Schaufeli et al. (2002b).

The instrument consists of 15 items grouped into three dimensions: emotional exhaustion (5 items), academic efficacy (6 items), and cynicism (4 items). The items are answered on a 7-point Likert-type scale ranging from 0 (Never) to 6 (Always) (Schaufeli, 2002b).

3. The Academic Procrastination Scale (EPA, from their Spanish initials) by Busko (1998).

This test comprises 16 items that form a unidimensional scale. It utilizes a 5-point Likert-type response scale ranging from 1 (*Always*) to 5 (*Never*) (Busko, 1998).

Procedure

The scales were administered using online questionnaires (Google Forms), which were programmed to allow progression only if a response had been selected; for this reason, all instruments were fully completed by the participants.

The instruments were administered virtually in groups by entering the institution's virtual classrooms during scheduled lecture times, following prior authorization from the authorities and the classroom instructor. The research objectives were explained, ensuring the confidentiality of the provided data, and emphasizing that participants could withdraw whenever they deemed appropriate without facing any negative consequences. Informed consent was subsequently obtained, all in accordance with the Declaration of Helsinki (WMA, 2013).

Data Analysis

Considering the validity evidence of each instrument, content-based validity was evaluated using Aiken's V index involving 5 experts. Concurrently, validity evidence based on internal structure was provided by conducting confirmatory factor analyses for each instrument (Muñiz, 2018; Furr, 2022).

Reliability was determined according to the procedure concerning McDonald's omega (Deng & Chan, 2017; Vizioli & Pagano, 2022) and Cronbach's alpha (Muñiz, 2018; Furr, 2022).

The primary analysis of the study was conducted through Structural Equation Modeling (SEM), including latent and observed variables (Bentler, 1990; Brown, 2015; Byrne, 2016; Kline, 2023; Schumacker & Lomax, 2016). The Weighted Least Squares Mean and Variance adjusted (WLSMV) estimator was applied, which is primarily used when:

1. Observed variables are ordinal.
2. The assumption of multivariate normality is violated.
3. The objective is to obtain robust parameters.
4. Polychoric correlation matrices are employed, which are more appropriate than Pearson matrices for ordinal data.

5. CFA, ESEM, or SEM are performed using polytomous items (Brown, 2015; Li, 2016; Muthén & Muthén, 2017).

The indirect effects were evaluated using the Bootstrapping procedure with 5,000 resamples. Bootstrapping is a set of statistical methods that construct empirical distributions of a statistic through the systematic repetition of sampling from the observed data, allowing the estimation of standard errors, confidence intervals, and significance tests without assuming population normality.

It is used to:

1. Estimate robust standard errors.
2. Construct empirical confidence intervals.
3. Evaluate statistical significance in the absence of normality.
4. Analyze indirect effects (mediation).
5. Work with small or moderate sample sizes.
6. Reduce reliance on unrealistic theoretical assumptions.

Bootstrapping is a resampling technique with replacement (Efron & Tibshirani, 1993; Hayes, 2018; Preacher & Hayes, 2008).

To determine the effect size of the interactions, the standardized β , SE_{boot} , the 95% CI, and the

proportion of the indirect effect were used (Hayes, 2018; Kline, 2023; Preacher & Hayes, 2008).

RESULTS

Content validity was assessed using Aiken's approach for the Schaufeli and Bakker Academic Engagement Questionnaire (SAE), with the assistance of five experts, and the respective validity was determined, as the items achieved Aiken's V values of 1.00 in each of the three dimensions of the SAE questionnaire. The calculations for confirmatory factor analysis (CFA) were then performed, as shown in Table 1, using the JASP and AMOS software programs.

The results indicate an adequate fit of the engagement construct model. First, it is observed that, due to the sample size, the χ^2 value is statistically significant: $\chi^2 (87) = 1199.079$, $p < .001$. The indices assessing the goodness of fit achieved adequate values (CFI = .961, TLI = .946, NFI = .961). Likewise, the RMSEA of .061 showed an appropriate value, which was similarly obtained with the SRMR = .071; additionally, the AVE was .623, indicating a good proportion of variance explained by the construct.

Table 1

Confirmatory Factor Analysis of Schaufeli and Bakker's Academic Engagement Questionnaire (SAE)

χ^2	gl	p	CFI	TLI	NFI	RMSEA	SRMR	AVE
1199.079	87	< .001	.961	.946	.961	.061	.071	.623

Note: χ^2 = Chi square, gl = degrees of freedom, p = level of statistical significance, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, NFI = Normed Fit Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual, AVE = Average Variance Extracted.

The reliability of the SAE dimensions and the total score was calculated using McDonald's omega coefficients and Cronbach's alpha (Table 2). For the dimensions, omega values ranged from .782 to .930, while Cronbach's alpha values ranged

from .686 to .918. For the total SAE, the omega coefficient was .898 and the alpha coefficient was .923. These results also contribute to the evidence of construct validity of the questionnaire.

Table 2

Reliability indices corresponding to the dimensions and the total of the SAE

Dimensions	Mean	SD	Nº ítems	Coefficient Ω	Coefficient α
Vigor	3.64	1.13	5	.782	.686
Dedication	4.66	1.11	5	.930	.918
Absorption	4.05	1.08	5	.835	.860
Total, SAE	4.12	0.99	15	.898	.923

Content validity for the Maslach Burnout Inventory for Students (MBI-SS) was determined using the procedure outlined by Aiken. Five experts participated, and the respective validity was established, as the items within each dimension yielded Aiken's V values of 1.00. Subsequently, the confirmatory factor analysis (CFA) was performed, as presented in Table 3. The JASP and AMOS software programs were used.

The results of the burnout model developed using the AFC indicate a good fit for the construct. The χ^2 value is statistically significant: $\chi^2(87) = 699.936$, $p < .001$. The indices assessing model fit yielded appropriate values (CFI = .975, TLI = .964, NFI = .971). Furthermore, the RMSEA = .043 and the SRMR = .056 yielded relevant values; it is also observed that the AVE was .556, which corresponds to an adequate explained variance of the construct.

Table 3

Confirmatory Factor Analysis of the Maslach Burnout Inventory for Students (MBI-SS)

χ^2	gl	p	CFI	TLI	NFI	RMSEA	SRMR	AVE
699.936	87	< .001	.975	.964	.971	.043	.056	.556

Note: χ^2 = Chi square, gl = degrees of freedom, p = level of statistical significance, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, NFI = Normed Fit Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual, AVE = Average Variance Extracted..

The reliability indices for the dimensions of the Maslach Burnout Inventory for Students (MBI-SS) were calculated using McDonald's omega and Cronbach's alpha (Table 4). Omega coefficients for the different dimensions ranged

from .831 to .871, and alpha values ranged from .823 to .867, thus contributing to the evidence of validity based on the internal structure of the construct.

Table 4

Reliability indices for the dimensions of the Maslach Burnout Inventory for Students (MBI-SS)

Dimensions	Mean	SD	Nº ítems	Coefficient Ω	Coefficient α
Emotional exhaustion	3.61	1.13	5	.831	.823
Academic competition	4.20	0.93	6	.859	.851
Cynicism	1.97	1.36	4	.871	.867

Content validity for the Busko Academic Procrastination Scale (EPA) was calculated using the procedure proposed by Aiken. Five experts participated, and the scale was found to be valid, as all items had an Aiken's V value of 1.00.

Confirmatory factor analysis (CFA) was then performed, as shown in Table 5, using the JASP and AMOS software programs.

The results of the Busko Academic Procrastination Scale (EPA) model indicate an adequate fit of the construct model. The χ^2 value is statistically significant: $\chi^2(104) = 1433.767$, $p < .001$. The coefficients evaluating model fit obtained appropriate values (CFI = .957, TLI =

.966, NFI = .951). Furthermore, the RMSEA = .064 and the SRMR = .052 obtained adequate values; additionally, the AVE was found to be .512, which corresponds to an acceptable explained variance of the construct.

Table 5

Confirmatory Factor Analysis of the Busko Academic Procrastination Scale (EPA)

χ^2	gl	p	CFI	TLI	NFI	RMSEA	SRMR	AVE
1433.767	104	< .001	.957	.966	.951	.064	.052	.512

Note: χ^2 = chi-square, gl = degrees of freedom, p = level of statistical significance, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, NFI = Normed Fit Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual, AVE = Average Variance Extracted.

The reliability of the Busko Academic Procrastination Scale (EPA) was calculated using McDonald's omega and Cronbach's alpha (Table

6). The results indicate an omega coefficient of .868 and a Cronbach's alpha value of .884, findings that in turn confirm validity of the scale.

Table 6

Reliability indices for the Busko Academic Procrastination Scale (EPA)

EPA	Mean	SD	Nº ítems	Coefficient Ω	Coefficient α
Total	2.48	0.55	16	.868	.884

With regard to the general research hypothesis positing the mediating role of the engagement variable in the relationship between the dimensions of academic burnout and academic procrastination among students of a public university in Metropolitan Lima, the model's findings indicated a good degree of model

fit (Table 7 and Figure 1). As expected, given the sample size ($n = 1058$), the χ^2 test was statistically significant: $\chi^2(8) = 176.552$, $p < .001$. The incremental indices showed high values (CFI = .974, TLI = .963, NFI = .972). Likewise, the RMSEA showed an adequate value (RMSEA = .051, 90% CI [.026, .069]), as did the RMR = .050.

Table 7

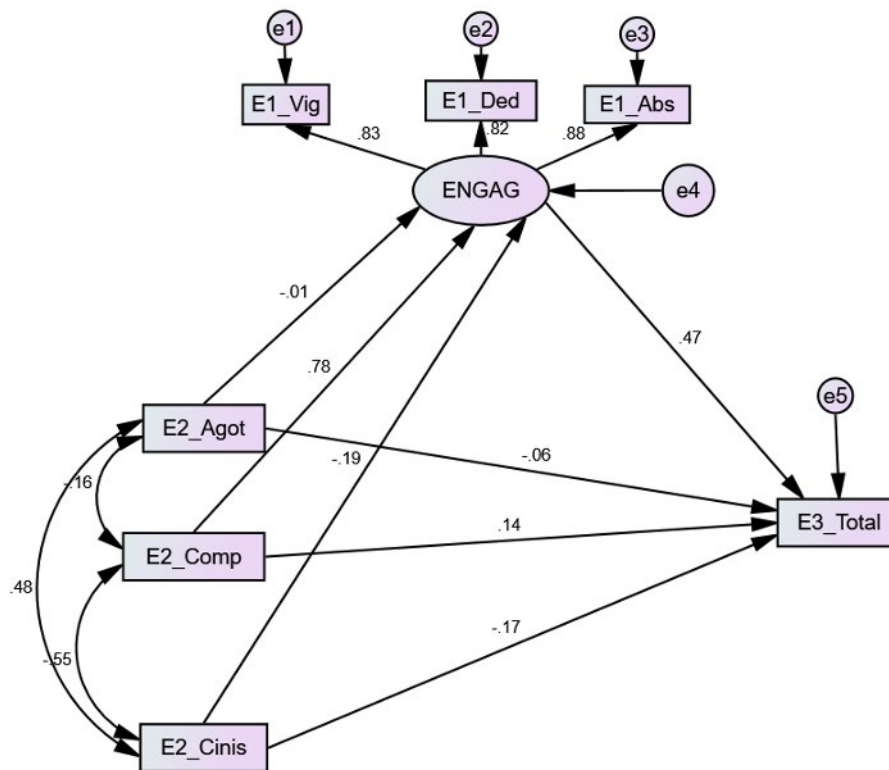
Model fit indices

χ^2	gl	p	CFI	TLI	NFI	RMSEA	RMSEA IC 95%	RMR
176.552	8	< .001	IC 974%	.963	.972	.049	[.026, .069]	.050

Note: χ^2 = chi-square, gl = degrees of freedom, p = level of statistical significance, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, NFI = Normed Fit Index, RMSEA = Root Mean Square Error of Approximation, RMSEA 95% CI = 95% confidence intervals for RMSEA, RMR = Root Mean Square Residual.

Figure 1

A model of the mediating role of engagement in the relationship between the components of academic burnout and academic procrastination



Note: The values in the figure are standardized scores. E1_Vig = Vigor dimension, E1_Ded = Dedication dimension, E1_Abs = Absorption dimension, ENGAG = Engagement, E2_Agot = Emotional exhaustion, E2_Comp = Academic competence, E2_Cinis = Cynicism, E3_Total = Academic procrastination

In the analysis of the pathways to mediator (engagement). Considering the first specific hypothesis, the relationship between emotional exhaustion and engagement was not statistically significant ($B = -.012$, $SE = .016$, $CR = -.705$, $p = .481$; $\beta = -.014$). The effect size falls between very small and small.

Regarding the second specific hypothesis, academic competence is positively associated with engagement (unstandardized regression coefficient (B) = .794, standard error (SE) = .025, critical ratio (CR) = 31.170, $p < .001$; standardized regression coefficient (β) = .782). The effect size in this case is large.

With regard to the third specific hypothesis, cynicism is negatively related ($B = -.135$, $SE = .016$, $CR = -8.276$, $p < .001$; $\beta = -.194$). The effect size is between small and medium.

In addition, engagement was found to be positively associated with academic procrastination ($B = 4.355$, $SE = .638$, $CR = 6.827$, $p < .001$; $\beta = .469$). The effect size is large.

The standardized indirect effects (Bootstrap, SE) (Table 8) indicated statistically significant mediation for academic competence ($\beta_{\text{indirect}} = 0.367$, $SE_{\text{boot}} = 0.065$, IC95% aprox. [0.240, 0.494], 72%), and for cynicism ($\beta_{\text{indirect}} = -0.091$, $SE_{\text{boot}} = 0.020$, 95% CI aprox. [-0.130, -0.052], 45%). In contrast, the indirect effect of emotional exhaustion was not statistically significant ($\beta_{\text{indirect}} = -0.007$, $SE_{\text{boot}} = 0.010$, 95% CI approx. [-0.027, 0.013], 17%).

The direct effect of emotional exhaustion on academic procrastination was $\beta = -.063$ ($p = .010$); for academic competence, the effect was $\beta = .140$ ($p = .018$); and for cynicism, it was $\beta = -.174$ ($p < .001$). Thus, it can be concluded that all direct effects were statistically significant.

In addition, with regard to the total standardized effects, academic competition had the highest coefficient ($\beta_{\text{total}} = .507$), followed by cynicism with a value of $\beta_{\text{total}} = -.265$, and finally, emotional exhaustion, which had a value of $\beta_{\text{total}} = -.070$.

Table 8*Standardized direct, indirect, and total effects on academic procrastination*

Variable	β_{direct}	p	β_{indirect}	SE _{boot}	95% CI		β_{total}
					Low	High	
Emotional exhaustion	-.063	.010	-0.007	0.010	[-0.027, 0.013]		-.070
Academic competition	.140	.018	0.367	0.065	[0.240, 0.494]		.507
Cynicism	-.174	< .001	-0.091	0.020	[-0.130, -0.052]		-.265

Note: β_{direct} = standardized coefficient of the direct effect, p = level of statistical significance, β_{indirect} = standardized coefficient of the indirect effect, SE_{boot} = standard error of the indirect effect estimated using Bootstrap, 95% CI = 95% confidence interval of the indirect effect, obtained using Bootstrap, β_{total} = standardized coefficient of the total effect.

In general, it can be concluded that the first specific hypothesis is not supported, as the interaction was not statistically significant.

However, the second specific hypothesis was confirmed because engagement was found to partially mediate the relationship between academic competence and academic procrastination. Likewise, the third specific hypothesis was confirmed, as it was found that engagement has a partial mediating effect on the relationship between cynicism and academic procrastination.

Based on the above, the proposed mediation model shows partial complementary mediation regarding the relationship between academic competence and cynicism on the one hand, and academic procrastination on the other.

DISCUSSION

The general hypothesis posited that the three dimensions of burnout were related to academic procrastination, and that these relationships were mediated by the presence of the engagement variable. By obtaining statistical indices that support the model, the structural equation modeling indicates that the dimensions of academic burnout in their relationships with academic procrastination were indeed modified as a result of the mediation of engagement. However, it is worth noting that mediation is not present in all specific cases; therefore, it is essential to identify the existence of potential differentiated mediations according to the specific dimensions of academic burnout in their relationships with academic procrastination.

Various studies, such as those by Delgado *et al.* (2015), Abad (2019), and Cruz and Da Silva (2024), reported significant statistical relationships between emotional exhaustion and academic procrastination, demonstrating that students with high levels of emotional exhaustion feel overwhelmed by academic demands, which leads them to exhibit procrastinating academic behaviors (Martinez & Salanova, 2003; Caballero *et al.*, 2010; Liébana-Presa *et al.*, 2018). When analyzing the mediation of engagement in the relationship between emotional exhaustion and academic procrastination, it is found that there was no significant statistical effect. This implies that this relationship is not affected by the presence of engagement; thus, the first specific hypothesis is not corroborated.

Studies such as those by Caballero *et al.* (2015a), Delgado *et al.* (2015), Liébana-Presa *et al.* (2018), and Abad (2019), among others, found inverse and statistically significant relationships between academic competence and academic procrastination. The results corresponding to the second specific hypothesis suggest a major partial mediation of engagement in the relationship between academic competence and academic procrastination. This is explained by the framework proposed by Parra (2010), who points out that academic engagement refers to a three-dimensional state of psychological well-being (vigor, absorption, and dedication) consisting of an intrinsic commitment toward one's studies. By being engaged in their academic activities, students will exhibit lower levels of procrastination, thereby validating the proposition corresponding to the second specific hypothesis.

Regarding the third specific hypothesis, which stated that engagement plays a mediating role in the relationship between cynicism and academic procrastination, correlational studies such as those by Delgado *et al.* (2015) and Abad (2019) report significant statistical relationships between cynicism and academic procrastination. These studies specify that students who present high levels of cynicism show a detached attitude toward studying, which would lead them to academic procrastinating behaviors (Martínez & Salanova, 2003; Caballero *et al.*, 2010; Liébana-Presa *et al.*, 2018). In this regard, it is feasible to note that a partial mediation of engagement has been found in the relationship between cynicism and academic procrastination, with a smaller statistical effect than that observed in the relationship between academic competence and academic procrastination.

This information would provide a comprehensive and theoretically consistent framework for understanding relevant aspects of students within the university context based on variables such as engagement, academic burnout, and academic procrastination, which could negatively affect academic performance.

CONCLUSIONS

1. Engagement does not mediate the relationship between emotional exhaustion and academic procrastination.
2. Engagement exerts a partial mediation between academic competence and academic procrastination.
3. Engagement partially mediates the relationship between cynicism and academic procrastination.
4. The proposed mediation model reveals a complementary partial mediation in the case of the relationships of academic competence and cynicism with academic procrastination.

RECOMMENDATIONS

1. Replicate this study in universities with other types of administration.
2. Conduct studies with these variables at different educational levels, such as middle/high school, higher education institutes, technological institutes, etc.
3. Conduct experimental studies considering academic variables related to the optimization of academic performance.
4. Perform longitudinal studies to obtain a deeper insight into this subject matter.
5. Implement a prevention-and-promotion program capable of raising awareness about the negative effects of academic burnout and academic procrastination in university students.
6. Develop intervention programs that can be applied to students with indicators of academic burnout and procrastination in order to reduce these rates and thus prevent negative effects on mental health and academic performance.
7. Formulate a prevention-and-promotion program capable of demonstrating how to develop engagement in participants to improve their academic competence and reduce negative academic attitudes, as well as academic procrastination.

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Rol de los autores:

AEDV: Conceptualization, introduction, methodology, data analysis, discussion, review, and drafting of the final report.

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