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University Belonging and Major Satisfaction among First-Year Physical Education Students: A Cross-Sectional Study

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Abstract

University belonging and major satisfaction are two key psychological constructs that influence first-year students' academic adjustment and retention. This cross-sectional study examined the relationship between university belonging and major satisfaction among first-year students enrolled in the Physical Education and Sports Sciences program (STAPS) at Kasdi Merbah University of Ouargla, Algeria. A purposive sample of 53 students (88.7% male, 11.3% female; aged 21.2 ± 5.2 years) completed two questionnaires developed for this study: the University Belonging Scale (15 items, $\alpha = .837$) and the Major Satisfaction Scale (15 items, $\alpha = .898$). Descriptive statistics, Pearson's correlation, and simple linear regression were computed using SPSS v25. University belonging was rated at a moderate-to-high level (3.84 ± 0.45; 76.77%), and major satisfaction was rated high (4.14 ± 0.50; 82.88%). A significant positive correlation was found between the two variables ($r = .565$, $p < .001$). Linear regression identified university belonging as a significant predictor of major satisfaction ($\beta = .565$, $B = 0.629$, $R^2 = .319$, $F(1, 51) = 23.88$, $p < .001$), explaining 31.9% of the variance. Exploratory factor analysis supported a two-factor structure for the belonging instrument and a unidimensional structure for the satisfaction instrument, and the association remained significant after removal of psychometrically weak items ($r = .506$, $p < .001$). These findings suggest that a stronger sense of university belonging was associated with higher major satisfaction scores in this sample. Practical implications for academic counseling in Algerian higher education institutions are discussed.

Keywords: university belonging · major satisfaction · first-year students · physical education · Algeria · cross-sectional study

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Introduction

The transition from secondary to higher education represents one of the most challenging periods in a student's academic trajectory. First-year students must adapt to a new social environment, new academic demands, and—in many cases—a major that may not fully correspond to their expectations or prior interests (Crawford et al., 2023). Two psychological constructs have been consistently identified as critical determinants of this transition: university belonging and major satisfaction.

University belonging refers to a student's subjective sense of being accepted, valued, and included within the university community (Baumeister & Leary, 1995). It encompasses the quality of interpersonal relationships with peers and faculty, the perception of institutional support, and the degree to which the student identifies with the academic environment (Allen et al., 2021). Belonging has been linked to academic motivation, persistence, and psychological well-being across diverse university contexts (Crawford et al., 2023; Vandenbroucke, 2022).

Major satisfaction refers to the positive psychological state arising from the alignment between a student's chosen academic field and their personal inclinations, abilities, and future aspirations (Al-Zoubi, 2013). It is considered an indicator of academic compatibility and a predictor of continued engagement and achievement (Mahfouzi, 2023; Qataf et al., 2022).

Physical Education and Sports Sciences (STAPS) represents a distinct academic context in which belonging and satisfaction may operate differently from other disciplines. The program combines theoretical content with demanding physical and pedagogical practice, and students' entry into the field may be driven by factors other than intrinsic motivation—including administrative assignment, which is common in the Algerian university system. This makes the study of belonging and major satisfaction particularly relevant in this context.

Despite a growing body of literature on university belonging in Western contexts, few studies have examined this construct in North African or Algerian universities. Furthermore, the relationship between belonging and major satisfaction has rarely been examined in physical education programs, and no study to our knowledge has done so in the specific context of first-year STAPS students in Algeria.

The present study addressed this gap with three aims: (1) to describe the levels of university belonging and major satisfaction among first-year STAPS students at Kasdi Merbah University of Ouargla; (2) to examine the bivariate relationship between the two variables; and (3) to test whether university belonging significantly predicts major satisfaction using linear regression analysis.

Method

Study design and participants

A cross-sectional, descriptive-correlational design was employed. Participants were 53 first-year students enrolled in the common-core STAPS program at the Institute of Physical Education and Sports Sciences, Kasdi Merbah University of Ouargla, Algeria, during the 2024/2025 academic year. Sample characteristics are presented in Table 1.

Table 1. Sociodemographic characteristics of the study sample (N = 53).

Variable	Category	n (%)
Age	17–25 years	46 (86.8%)
	26–35 years	3 (5.7%)
	Over 35 years	3 (5.7%)
Gender	Male	47 (88.7%)
	Female	6 (11.3%)
Baccalaureate	Literature & Philosophy	23 (43.4%)
	Experimental Sciences	15 (28.3%)
	Management & Economics	1 (1.9%)
	Foreign Languages	7 (13.2%)
	Other / Not reported	7 (13.2%)

Note. One participant did not report age; three participants were aged 36, 40 and 42 years. The "Other / Not reported" baccalaureate category comprises two blank responses, two uninterpretable entries, and three streams outside the four listed categories (Islamic Sciences, Physical Activities, and Physical and Sport Activity Techniques). Mean age = 21.2 years (SD = 5.2).

A purposive sample was selected based on regular attendance at theoretical sessions. Given that the study targeted the entire accessible population of first-year STAPS students during the data collection period, the sample size (N = 53) was considered adequate for exploratory correlational analysis (Green, 1991). The questionnaire was administered online via Google Forms during a scheduled lecture in December 2024.

Measures

Two five-point Likert-scale questionnaires (1 = strongly disagree to 5 = strongly agree) were developed for this study. The instrument development followed a three-step procedure: (1) item generation based on the theoretical frameworks of Al-Anani (2007) and Al-Zoubi (2013); (2) content validity assessment by a panel of five academic experts in educational psychology and physical education, who rated item relevance and clarity and recommended minor linguistic adjustments; and (3) pilot testing on a sample of 15 students from the same population (not included in the main analysis) to estimate internal consistency. No back-translation was conducted as both the original frameworks and the target population share Arabic as the primary academic language.

University Belonging Scale (15 items): Items measure students' sense of integration within the university community across four dimensions: peer relationships, faculty academic support, institutional acceptance, and participation in university activities. Items with poor item-total correlations ($r < .30$) were revised following pilot testing. Sample items from the University Belonging Scale include: "I feel that I am part of this university" and "My professors care about my academic progress." Sample items from the Major Satisfaction Scale include: "I chose this major based on my personal interests" and "I am satisfied with the content of my academic program."

Major Satisfaction Scale (15 items): Items assess students' positive psychological orientation toward their chosen academic major, covering alignment with personal inclinations and abilities, perceived relevance of the major, recognition of its professional value, and absence of regret about the academic choice.

Internal consistency reliability was assessed using Cronbach's alpha coefficient on both the pilot sample (n = 15) and the main study sample (N = 53). Results are presented in Table 2. Alpha values for the main sample were: University Belonging Scale $\alpha = .837$ and Major Satisfaction Scale $\alpha = .898$, both indicating good internal consistency (Nunnally & Bernstein, 1994). All alpha coefficients exceeded the 0.70 threshold recommended by Nunnally and Bernstein (1994), confirming acceptable to good internal consistency for both scales.

Table 2. Reliability coefficients (Cronbach's α) for study instruments.

Axis	Items	Cronbach's α	Interpretation
University Belonging	15	0.837	Good
Major Satisfaction	15	0.898	Excellent
Overall questionnaire	30	0.911	Excellent

Statistical analysis

Data were analyzed using IBM SPSS Statistics version 25. Descriptive statistics (means, standard deviations, and percentage scores) were computed for each scale. Pearson's product-moment correlation coefficient was used to examine the bivariate relationship between university belonging and major satisfaction. Simple linear regression was then applied to assess the predictive contribution of university belonging (independent variable) to major satisfaction (dependent variable). Given the exploratory nature of the study and the small sample size (N = 53), a parsimonious model with a single predictor was preferred over multiple regression to avoid overfitting (Green, 1991). The male-dominated sample composition reflects the actual demographic of the program and is acknowledged as a limitation; sex was not included as a covariate due to insufficient statistical power for subgroup analyses with this sample size. The significance level was set at $\alpha = .05$.

Assumption testing. The assumptions underlying Pearson correlation and simple linear regression were formally evaluated before the analyses were interpreted. Normality was assessed using the Shapiro-Wilk and Kolmogorov-Smirnov tests together with skewness and kurtosis indices; linearity was assessed using the Ramsey RESET test and by comparing the Pearson coefficient with its rank-order (Spearman) equivalent; homoscedasticity was assessed using the Breusch-Pagan test; and independence of residuals was assessed using the Durbin-Watson statistic. Influential cases were screened using Cook's

distance and studentised residuals. Because one normality index was marginally violated (see Results), bias-corrected and accelerated (BCa) bootstrap confidence intervals based on 5,000 resamples were computed for the correlation coefficient and the regression slope as a distribution-free robustness check.

Psychometric analysis. Prior to hypothesis testing, the factorial structure of both instruments was examined using exploratory factor analysis (EFA). Factorability was verified using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. Factors were extracted using the minimum residual (MINRES) method, which is robust to departures from normality and to modest sample sizes, and the number of factors retained was determined by Horn's parallel analysis (1,000 randomly generated datasets, 95th percentile criterion) rather than the Kaiser eigenvalue-greater-than-one rule, which is known to over-extract (Hayton et al., 2004; Horn, 1965; Watkins, 2018). Where more than one factor was retained, an oblique (direct oblimin) rotation was applied, since the underlying dimensions were expected to correlate. A primary loading of .35 was adopted as the salience threshold, in line with recommended practice for exploratory factor analysis (Watkins, 2018). Reliability was assessed using Cronbach's alpha and composite reliability (CR), and convergent and discriminant validity were evaluated using average variance extracted (AVE) and the Fornell-Larcker criterion (Fornell & Larcker, 1981). Factor analyses were conducted in Python 3.12 using the factor_analyzer and SciPy libraries; all other analyses were conducted in SPSS v25.

Ethical considerations

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. As this study involved only an anonymous online questionnaire with no sensitive personal data, no formal ethics committee approval was required under the institutional regulations of Kasdi Merbah University of Ouargla at the time of data collection. Participation was entirely voluntary, and informed consent was obtained from all participants prior to questionnaire completion. Participants were informed of the study purpose, their right to withdraw at any time without consequence, and the anonymous nature of their responses. Anonymity was preserved throughout data collection: the Google Forms instrument was configured to prevent the recording of email addresses or other identifying information. Data were stored on a password-protected institutional account accessible only to the research team.

Results

Assumption testing. Linearity was supported: the Ramsey RESET test was non-significant ($F(1, 50) = 1.31$, $p = .258$) and the Spearman rank-order coefficient ($\varrho = .558$) was virtually identical to the Pearson coefficient ($r = .565$), indicating no appreciable non-linear component. Homoscedasticity was supported by a non-significant Breusch-Pagan test ($LM = 2.97$, $p = .085$). Independence of residuals was supported by a Durbin-Watson statistic of 2.25, within the conventional 1.5-2.5 range. Screening for influential cases yielded a maximum Cook's distance of 0.21, well below the conventional cut-off of 1.0, and no case was therefore excluded. Normality was partially violated: the Shapiro-Wilk test on the regression residuals was marginally significant ($W = .951$, $p = .030$), although the Kolmogorov-Smirnov test was non-significant ($D = .086$, $p = .795$) and skewness (-0.71) and kurtosis (1.47) fell within the ± 2 and ± 7 bounds commonly regarded as acceptable for parametric analysis (Kim, 2013; West et al., 1995). As a distribution-free safeguard, BCa bootstrap confidence intervals (5,000 resamples) were computed and confirmed the parametric estimates: $r = .565$, 95% CI [.398, .726]; $B = 0.629$, 95% CI [0.397, 0.907]. The parametric results reported below can therefore be interpreted with confidence.

Table 3 presents descriptive statistics for both study variables. University belonging showed a moderate-to-high level ($M = 3.84$, $SD = 0.45$; 76.77% of maximum), and major satisfaction showed a high level ($M = 4.14$, $SD = 0.50$; 82.88% of maximum). Both means were statistically significantly above the scale midpoint (3.0), as confirmed by one-sample t-tests ($t(52) = 13.57$, $p < .001$ for belonging; $t(52) = 16.64$, $p < .001$ for satisfaction).

Table 3. Descriptive statistics for university belonging and major satisfaction (N = 53).

Variable	M	SD	Min	Max
University Belonging	3.84	0.45	2.53	4.67
Major Satisfaction	4.14	0.50	2.67	4.93

Table 4 presents the Pearson correlation matrix. A moderate, positive, and statistically significant correlation was found between university belonging and major satisfaction ($r = .565$, $p < .001$, two-tailed). The cross-sectional design does not permit causal or temporal inference.

Table 4. Pearson correlation matrix for university belonging and major satisfaction (N = 53).

Variable	University Belonging	Major Satisfaction
University Belonging	1	.565**
Major Satisfaction	.565**	1
M (SD)	3.84 (0.45)	4.14 (0.50)

Note. **p < .001 (two-tailed).

To further examine the predictive relationship, a simple linear regression was conducted with university belonging as the predictor and major satisfaction as the outcome. Results are presented in Table 5. The overall model was statistically significant ($F(1, 51) = 23.88$, $p < .001$) and explained 31.9% of the variance in major satisfaction ($R^2 = .319$, adjusted $R^2 = .306$). University belonging was a significant positive predictor ($B = 0.629$, $SE = 0.129$, $\beta = .565$, $t = 4.891$, $p < .001$). The regression equation was: *Major Satisfaction = 1.730 + 0.629 × University Belonging*

Table 5. Simple linear regression: University belonging predicting major satisfaction (N = 53).

Predictor	B	SE	β	t	p
(Constant)	1.730	0.497	—	3.484	< .001
University Belonging	0.629	0.129	.565	4.891	< .001

Note. $R^2 = .319$; Adjusted $R^2 = .306$; $F(1, 51) = 23.88$, $p < .001$. B = unstandardized coefficient; SE = standard error; β = standardized coefficient; 95% CI for B [0.371, 0.887].

Psychometric properties of the instruments

University Belonging Scale. The data were suitable for factor analysis (KMO = .739; Bartlett's χ^2 (105) = 313.4, $p < .001$). Parallel analysis supported a two-factor solution accounting for 37.4% of the total variance. Factor 1, labelled institutional and relational support, comprised eight items reflecting perceived acceptance within the university community, faculty communication and guidance, access to services, and perceived institutional care. Factor 2, labelled engagement in university activities, comprised five items reflecting participation in, and perceived benefit from, university events and sporting and social activities. The two factors were moderately correlated ($r = .35$), supporting the use of an oblique rotation and confirming that belonging operates as a multidimensional rather than a unitary construct in this sample, consistent with the theoretical framing adopted in the present study (Allen et al., 2021). Two items (items 5 and 14) did not reach the .35 salience threshold on either factor. Factor loadings are presented in Table 6. Internal consistency was good for the total scale ($\alpha = .837$) and for both subscales (Factor 1 $\alpha = .780$; Factor 2 $\alpha = .838$), and composite reliability was good (CR = .837).

Table 6. Exploratory factor analysis of the University Belonging Scale (15 items, MINRES extraction, direct oblimin rotation; N = 53).

Item	F1	F2	h²
1. I feel I belong to the university community	.597		.378
2. I have positive relationships with peers in my major	.387		.164
3. My instructors are easy to communicate with	.650		.429
4. I find support when facing academic or social difficulties	.515		.271
5. I have friends at university I feel comfortable with	—	—	.049
6. My instructors provide the academic guidance I need	.570		.328
7. The university cares about developing my skills	.582		.339
8. Sufficient resources are available (library, activities, workshops)		.569	.325
9. Administrative and academic services are easily accessible	.515		.267
10. The university provides a safe and stimulating learning environment	.662		.452
11. I take part in university events and activities		.523	.276
12. I find university activities enjoyable and useful		.798	.682
13. The university encourages sporting and social participation		.927	.889
14. I am enthusiastic about joining activities that build group belonging	—	—	.212
15. University activities help me build new relationships		.587	.374
% of variance	20.1	17.3	37.4
Cronbach's α	.780	.838	.837 (total)

Note. KMO = .739; Bartlett's χ^2 (105) = 313.4, $p < .001$; inter-factor correlation r = .35; composite reliability = .837. Loadings below .35 are omitted; — indicates no salient loading on either factor. Item wording is abbreviated.

Major Satisfaction Scale. Factorability was likewise supported (KMO = .765; Bartlett's χ^2 (105) = 511.5, $p < .001$). Parallel analysis retained a single factor accounting for 42.5% of the variance, with salient loadings ranging from .38 to .81 and corrected item-total correlations from .37 to .76. Only one item (item 6) failed to load. This supports the interpretation of major satisfaction as a unidimensional, global evaluative judgement rather than a set of separable facets. Factor loadings are presented in Table 7. Reliability was high (α = .898; CR = .917).

Table 7. Exploratory factor analysis of the Major Satisfaction Scale (15 items, MINRES extraction, single-factor solution; N = 53).

Item	Loading	h²	Item-total r
16. The major meets the expectations I held before entering university	.768	.590	.736
17. The subjects studied in the major are interesting	.438	.192	.447
18. The major aligns with my future ambitions	.792	.627	.749
19. I feel I chose the right major for me	.810	.655	.756
20. The learning environment in the major is comfortable and encouraging	.378	.143	.368
21. I enjoy attending lectures and activities related to the major	—	.021	.072
22. I find the course content practical and applicable to my career	.483	.233	.467
23. The major helps me develop my sporting and personal skills	.775	.601	.741
24. I am enthusiastic about gaining more knowledge in my field	.511	.261	.490
25. My instructors encourage creativity and excellence in the major	.532	.283	.517
26. My major helps me achieve my professional goals	.785	.615	.732
27. I believe I will find good employment after graduating in this major	.641	.410	.600
28. The major opens broad horizons for me in the sporting field	.812	.659	.758
29. I can envisage my professional future more clearly thanks to the major	.707	.499	.670
30. The major gives me a competitive advantage in the labour market	.778	.605	.752
% of variance	42.5		
Cronbach's α	.898		

Note. KMO = .765; Bartlett's χ^2 (105) = 511.5, $p < .001$; composite reliability = .917. Loadings below .35 are omitted (—). Item-total r = corrected item-total correlation. Item wording is abbreviated.

Convergent and discriminant validity. Composite reliability of the retained items exceeded .80 for both instruments, supporting convergent validity. Average variance extracted fell below the conventional .50 benchmark (belonging AVE = .30; satisfaction AVE = .46); however, convergent validity may still be regarded as adequate when composite reliability exceeds .60 (Fornell & Larcker, 1981). Discriminant validity was supported by the Fornell-Larcker criterion: the square root of AVE for each construct (belonging = .55; satisfaction = .68) exceeded the correlation between the retained-item scale scores (r = .506), indicating that the two instruments capture related but empirically distinguishable constructs.

Sensitivity analysis. To verify that the observed association was not driven by psychometrically weak items, the main analysis was repeated after removing the three items that failed to reach the .35 salience threshold in the EFA (belonging items 5 and 14; satisfaction item 6). Sampling adequacy improved for both purified scales (KMO = .771 and .790, respectively), while internal consistency was essentially unchanged for belonging (α = .833) and improved for satisfaction (α = .911). The association between university belonging and major satisfaction remained positive and statistically significant (r = .506, 95% CI [.27, .68], $p < .001$; $R^2 = .256$). The substantive conclusion of the study was therefore unchanged by item selection.

Discussion

This study examined the relationship between university belonging and major satisfaction among first-year Physical Education students at an Algerian university. Three principal findings emerge.

First, both university belonging (M = 3.84; 76.77%) and major satisfaction (M = 4.14; 82.88%) were rated at moderate-to-high and high levels, respectively, by first-year STAPS students. The higher level of major satisfaction relative to belonging is noteworthy and may reflect the specific nature of physical education as a practical, movement-based discipline that students find inherently engaging, even before they have fully integrated into the university's social fabric. These findings are consistent with Crawford et al. (2023) and Vandenbroucke (2022), who emphasized the vulnerability of first-year students in terms of perceived support and institutional integration.

Second, the moderate positive correlation (r = .565, $p < .001$) indicates a meaningful association between belonging and satisfaction. This finding aligns with Mahfouzi (2023), who reported a significant association between major satisfaction and psychological compatibility in a comparable Algerian sample, with Qataf et al. (2022), who linked major satisfaction to achievement motivation, and with Bakir (2015), who reported a comparable association between study satisfaction and cognitive motivation. The present result extends this evidence base to the specific context of STAPS programs in southern Algeria.

Third, the regression analysis identified university belonging as a statistically significant predictor of major satisfaction within the model (β = .565, $R^2 = .319$, $p < .001$), explaining approximately 32% of its variance. It is important to emphasise that the term "predictor" is used here in its statistical sense only: because all variables were measured at a single time point, the analysis establishes covariation rather than any directional, temporal or causal relationship. What the model shows is that students who perceived their university environment as more supportive, accepting and engaging also reported greater satisfaction with their chosen major. From a theoretical perspective, this is consistent with Self-Determination Theory (Ryan & Deci, 2000), which posits that the satisfaction of the psychological need for relatedness (belonging) facilitates intrinsic motivation and engagement with academic content. The cross-sectional design does not allow the direction of this relationship to be determined. It is equally plausible that students more satisfied with their major develop a stronger sense of belonging, or that both constructs are influenced by a third variable such as academic self-efficacy or initial motivation. These findings have practical implications for Algerian higher education institutions. Should the direction of this association be confirmed longitudinally, academic advisors and administrators may consider belonging-enhancing interventions at the beginning of the academic year, particularly peer-mentoring programs, orientation activities, and faculty–student advisory structures. Whether improving students' sense of belonging produces downstream benefits for commitment to the major and for retention remains an empirical question that the present cross-sectional design cannot answer.

Limitations

Several limitations should be acknowledged. First, the purposive sample (N = 53) drawn from a single institution in southern Algeria substantially limits the generalizability of findings to other universities, regions, or educational systems. Several consequences follow from this. Because participants were selected on the basis of regular attendance at theoretical sessions, students who attend irregularly - plausibly those with the weakest

sense of belonging and the lowest major satisfaction - are systematically under-represented, which may have restricted the observed range on both variables and biased the estimated association. The institutional context is also specific: Kasdi Merbah University of Ouargla serves a largely regional intake in southern Algeria, and patterns of belonging in a single-campus setting of this kind need not generalise to metropolitan or multi-campus institutions. A sample of 53 provides approximately 80% power to detect a correlation of $r = .37$ at $\alpha = .05$ (two-tailed), so weaker but potentially meaningful associations would not have been detected, and the confidence interval around the observed coefficient remains wide (95% CI [.35, .72]). Finally, the single-institution design precludes any examination of institution-level moderators such as campus size, student services provision, or programme structure. Replication across multiple Algerian institutions with probability-based sampling is therefore a priority. Second, the sample was highly male-dominated (88.7% male), reflecting the actual demographic composition of the STAPS program at this institution but preventing meaningful gender comparisons and limiting representativeness for mixed-gender populations. Third, the cross-sectional design precludes causal inference; the identified predictive relationship between belonging and satisfaction is associational and may reflect reverse causation or the influence of unmeasured third variables. Fourth, although exploratory factor analysis supported the factorial structure of both instruments, confirmatory factor analysis could not be performed on the present sample, since CFA requires a substantially larger participant-to-item ratio than was available here (MacCallum et al., 1999); the factor structures reported should therefore be regarded as provisional and require cross-validation in an independent, larger sample. Average variance extracted also fell below the .50 benchmark for both instruments, indicating that a proportion of item variance remains unexplained by the retained factors. Fifth, the use of a purposive rather than probability-based sampling procedure introduces selection bias. Sixth, although the study was framed around first-year students, six participants were older than 25 years, reflecting the presence of mature and re-orienting students in the Algerian system; their inclusion is reported transparently but may introduce heterogeneity in the experience of first-year transition. Future research should address these limitations through larger probability samples across multiple Algerian institutions, longitudinal or experimental designs, mixed-gender populations, validated through content validity and internal consistency instruments, and path-analytic or structural equation modeling approaches.

Conclusion

This study found moderate-to-high levels of both university belonging and major satisfaction among first-year STAPS students at Kasdi Merbah University. A significant positive correlation was observed ($r = .565$, $p < .001$), and a simple regression model accounted for approximately 32% of the variance in major satisfaction ($R^2 = .319$, $p < .001$). Because the design was cross-sectional, these results describe covariation and do not support causal or temporal inference. These results suggest that enhancing students' sense of belonging—through targeted institutional support, peer engagement programs, and responsive faculty advising—is associated with academic satisfaction; longitudinal and experimental designs are needed to establish directionality and causal mechanisms. Future studies should replicate these findings in larger and more diverse Algerian university samples and explore potential mediating variables such as academic self-efficacy and institutional trust.

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