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Authentic Leadership and Innovative Work Behavior in Higher Education: The Roles of Resilience and Innovation Support

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Abstract. This cross-sectional, self-report study examined how authentic leadership relates to innovative work behavior among academic, academic-management, and administrative/professional employees in higher education, and whether employee resilience and perceived organizational support for innovation explain when this relationship is stronger. Data were obtained from 412 employees across public, private, and applied/technical universities. Partial least squares structural equation modeling was used to assess the reflective measurement model, direct relationships, mediation, moderation, conditional indirect effects, predictive performance, and robustness across employee and institutional groups. Authentic leadership was positively related to employee resilience ($\beta = .624$) and innovative work behavior ($\beta = .296$), while resilience was positively related to innovative work behavior ($\beta = .458$). The indirect effect through resilience was significant ($\beta = .286$, 95% CI [.238, .335]). Perceived organizational support for innovation strengthened the resilience-innovation relationship ($\beta = .125$, 95% CI [.072, .175]), and the index of moderated mediation was positive (index = .078, 95% CI [.044, .111]). The model explained 69.0% of the variance in innovative work behavior. Because the design was cross-sectional and single source, the findings are interpreted as statistical relationships rather than causal effects.

Keywords: authentic leadership; employee resilience; innovation support; innovative work behavior; higher education

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1. Introduction

Higher education institutions increasingly operate as innovation-intensive organizations. Universities redesign curricula for digital and hybrid learning, develop industry partnerships, respond to accountability requirements, and reconfigure academic and student services while protecting scholarly values. These pressures make employees' day-to-day innovative work behavior a strategic capability because institutional change depends on people who identify problems, generate alternatives, gain support, and implement workable solutions (Elrehail et al., 2018; Hassan et al., 2024; Hughes et al., 2018; Wei et al., 2025). Recent 2026 evidence further indicates that institutional design and leadership capability can support adaptive reform and innovation in higher education (Che, 2026; Wang et al., 2026).

Innovative work behavior extends beyond creativity. It includes the intentional generation, promotion, and implementation of new ideas in a role, team, or organization. In universities, this behavior may involve redesigning assessment, developing digitally supported teaching, improving research administration, strengthening student support, or simplifying cross-unit procedures. Ideas often fail to reach implementation when employees lack legitimacy, time, resources, or a supportive climate, which makes leadership and organizational context central to the innovation process (AlEssa & Durugbo, 2022; Lukeš & Stephan, 2017; Shanker et al., 2017; Srirahayu et al., 2023).

Authentic leadership is relevant because it emphasizes self-awareness, relational transparency, balanced processing, and an internalized moral perspective. These behaviors can make disagreement safer and decision-making more credible in knowledge-intensive settings. Nevertheless, authentic leadership overlaps conceptually with other positive leadership approaches, and its effect on innovation should not be assumed to be automatic. The present study therefore treats authentic leadership as a relational resource whose usefulness depends on the adaptive capacity of employees and the institutional conditions surrounding innovation (Banks et al., 2016; Baquero, 2023; Gardner et al., 2021; Hoch et al., 2018).

Employee resilience provides the hypothesized behavioral mechanism. Contemporary workplace research defines resilience as a developable capacity to adapt, learn, use networks, and remain effective during adversity or change, rather than as fixed toughness. Such capacity is especially pertinent when employees must revise an idea after criticism, learn unfamiliar digital tools, or continue implementation through slow approval processes and workload pressure (Fisher et al., 2019; Hartmann et al., 2020; Kuntz et al., 2017; Näswall et al., 2019). Recent evidence also indicates that authentic leadership can support employee resilience through employee vigor and role-breadth self-efficacy (Li & Li, 2026).

The model also recognizes that resilient employees require an enabling context. Perceived organizational support for innovation refers here to the individual employee's perception that the institution encourages, resources, recognizes, and protects responsible experimentation. It includes time, training, digital infrastructure, seed funding, cross-unit collaboration, fair recognition, and tolerance for well-intentioned failure. Recent higher education evidence similarly shows that perceived institutional support and innovation climate can activate digital teaching and teacher innovation through efficacy, knowledge sharing, and collaborative mechanisms (Chen & Chang, 2025; Du & Chang, 2023; Wei et al., 2025). A 2026 synthesis of organizational resilience in educational institutions likewise identifies leadership, digital capacity, social capital, and organizational learning as central adaptive-capacity themes (Zakwan et al., 2026).

1.1 Problem Statement

The core problem is not a shortage of innovation rhetoric but an incomplete explanation of how university employees sustain innovation under uncertainty. Leadership studies often estimate a direct relationship between leader behavior and innovation, while resilience studies frequently emphasize employee adaptation without specifying the institutional conditions that convert adaptation into implemented ideas. This separation can produce an overly leader-centered or individual-centered account. A university may have credible leaders but insufficient time and infrastructure for implementation; conversely, it may provide innovation programs that employees do not use because change has depleted trust and adaptive resources. The empirical gap is therefore whether employee resilience carries part of the authentic leadership-innovative work behavior relationship in higher education and whether perceived organizational support for innovation strengthens that pathway.

1.2 Study Objectives

1. To assess the relationship between authentic leadership and innovative work behavior among higher education employees.
2. To assess the relationship between authentic leadership and employee resilience.
3. To determine whether employee resilience is related to innovative work behavior and mediates the authentic leadership-innovative work behavior relationship.
4. To determine whether perceived organizational support for innovation strengthens the relationship between employee resilience and innovative work behavior and thereby conditions the indirect effect of authentic leadership.
5. To evaluate the measurement quality, predictive performance, common-method diagnostics, and robustness of the study model across employee and institutional groups.

1.3 Research Questions

RQ1: How is authentic leadership related to innovative work behavior?

RQ2: How is authentic leadership related to employee resilience?

RQ3: Does employee resilience relate to innovative work behavior and statistically mediate the authentic leadership-innovative work behavior relationship?

RQ4: Does perceived organizational support for innovation strengthen the employee resilience–innovative work behavior relationship and the corresponding indirect effect?

RQ5: Are the model's measurement and structural pattern robust after common-method, predictive, control-variable, and subgroup assessments?

1.4 Study Variables

The exogenous predictor is authentic leadership (AL); employee resilience (ER) is the mediator; perceived organizational support for innovation (OSI) is the moderator and an additional predictor; and innovative work behavior (IWB) is the outcome. All constructs are modeled at the individual level. In particular, OSI is treated as an employee perception rather than an institution-level climate because no institutional-level aggregation procedure is used in the analysis. Demographic and institutional variables—gender, age, role, tenure, education, and institution type—are used in sensitivity or subgroup analyses rather than as focal explanatory variables.

1.5 Significance and Originality

The study's novelty lies in the configuration and higher education application of established variables rather than in claiming that any single construct is new. It links a relational leadership resource to a personal adaptive resource and then identifies an institutional activation condition. This integrated account addresses both the “how” and “when” of employee innovation. It also broadens higher education innovation research beyond academic staff alone by including professional employees and academic managers, whose work spans teaching, research support, digital services, quality assurance, and institutional coordination. The resulting framework offers a more actionable explanation than a direct-effect model because it distinguishes leadership development, resilience-building, and organizational support as complementary—not substitutable—intervention targets.

2. Literature Review and Theoretical Framework

The framework combines four theories because each addresses a different level of the study process. Authentic leadership theory defines the focal leader behaviour's; conservation of resources theory explains resource gain and loss; the job demands–resources model clarifies how social and personal resources support motivated action under demanding conditions; and social exchange theory explains why employees reciprocate trustworthy and supportive treatment with discretionary effort. Their roles and limitations are summarized in Table 1.

Table 1: Theoretical foundations and roles in the model

Framework	Foundational source	Core tenet	Role and caution
Authentic leadership theory	Avolio and Gardner (2005); Walumbwa et al. (2008)	Self-awareness, relational transparency, balanced processing, and an internalized moral perspective create credible leader-follower relations.	Defines AL; conceptual overlap with transformational and ethical leadership requires cautious claims.
Conservation of resources theory	Hobfoll (1989); Hobfoll et al. (2018)	People seek to acquire and protect valued psychological, social, informational, and material resources.	Explain AL as a resource passageway and ER as a resource; cross-sectional data cannot establish resource-gain sequences.
Job demands-resources model	Demerouti et al. (2001); Bakker and Demerouti (2017)	Job resources motivate engagement and buffer demands; personal resources help employees use opportunities.	Links leadership and resilience to innovation under workload and change demands; the model may omit other demands and resources.
Social exchange theory	Blau (1964); Cropanzano et al. (2017)	Supportive and fair treatment creates reciprocal obligations and discretionary contributions.	Explains why OSI encourages IWB; exchange perceptions may be inflated by same-source measurement.

2.1 Authentic Leadership and Innovative Work Behavior

Authentic leaders are expected to support innovative work behavior because transparent communication and balanced processing reduce the interpersonal risk of proposing ideas. Self-awareness allows leaders to acknowledge knowledge limits; relational transparency makes disagreement legitimate; balanced processing signals that contrary evidence will be considered; and an internalized moral perspective reduces fears that innovation decisions are driven by favoritism. These mechanisms are important in universities, where expertise is distributed and employees often retain discretion over teaching, research, and service practices (Avolio & Gardner, 2005; Gardner et al., 2021; Walumbwa et al., 2008).

Empirical studies generally link authentic or related relational leadership approaches with innovative work behavior, proactive personality, engagement, knowledge sharing, and service innovation. Higher education studies also show that leadership can influence teacher innovation through organizational innovation climate, knowledge management, and self-efficacy. However, meta-analytic work warns that authentic leadership shares variance with transformational and ethical leadership. The expected relationship is therefore positive but not presumed unique or causal (Bai et al., 2022; Elrehail et al., 2018; Shi & Chang, 2025; Wei et al., 2025; Yamak & Eyupoglu, 2021). Recent studies also connect leadership with innovative work behavior through engagement and

resilience-related mechanisms in educational and organizational settings (Siregar et al., 2026; Srimongkolkul et al., 2025).

2.2 Authentic Leadership and Employee Resilience

Authentic leadership can provide information, trust, respectful treatment, and ethical consistency during change. Conservation of resources theory treats such conditions as resource passageways that help employees avoid loss and invest in adaptation. The job demands–resources model likewise positions leadership as a social and informational job resource, while resilience represents a personal resource that supports continued functioning when demands rise (Bakker & Demerouti, 2017; Hobfoll et al., 2018).

Cross-level and multi-sample evidence links authentic leadership with resilience through perceived insider status, error-management climate, flow, organizational identification, and trust. These mechanisms fit higher education, where employees must interpret ambiguous change, coordinate across professional boundaries, and learn from unsuccessful implementation attempts. Still, resilience should not be treated as a leader-produced trait; it is dynamic and shaped by time, work design, relationships, and institutional resources (Fisher et al., 2019; Li & Zhang, 2022; Mao et al., 2023).

2.3 Employee Resilience and Innovative Work Behavior

Innovation requires persistence through uncertainty, repeated feedback, and possible failure. Resilient employees are better positioned to adapt an idea, seek assistance, use networks, and continue after rejection. This capability supports not only idea generation but also championing and implementation, which are often the more demanding stages of innovative work behavior. In higher education, resilience may help employees navigate committee review, professional disagreement, technology problems, and competing workload demands (Caniëls & Baaten, 2019; Hartmann et al., 2020; Kwon & Kim, 2020; Näswall et al., 2019).

2.4 Mediating Role of Employee Resilience

The mediation argument combines the preceding relationships. Authentic leadership supplies relational and informational resources; those resources are reflected in stronger employee resilience; and resilient employees are more willing and able to invest effort in uncertain innovation tasks. This is a partial rather than exclusive mechanism because leaders can also influence idea voice directly, and other mediators—including engagement, trust, psychological safety, and knowledge sharing—may operate simultaneously. Existing studies support the component links but rarely test resilience as the mediator between authentic leadership and innovative work behavior in higher education (Bai et al., 2022; Hartmann et al., 2020; Li & Zhang, 2022; Mao et al., 2023).

2.5 Organizational Support for Innovation as a Boundary Condition

Resilience supplies adaptive capacity, but implementation also requires opportunity. When employees perceive strong innovation support, they can access time, training, technologies, allies, decision channels, and protection for responsible trial and error. When support is weak, resilience may be spent on coping with barriers rather than implementing ideas. Innovation climate,

perceived organizational support, and supportive human resource practices are consistently related to employee innovation, knowledge sharing, and digital teaching behavior (Al-Taie & Khattak, 2024; Bos-Nehles & Veenendaal, 2019; Chen & Chang, 2025; Ononye, 2023; Shanker et al., 2017; You et al., 2022). This logic also yields moderated mediation. If OSI strengthens the ER-IWB path, then the indirect relationship between AL and IWB through ER should increase as OSI rises. The conditional effect is theoretically meaningful because it distinguishes “being able to adapt” from “having a viable route to innovate.” It also prevents the model from placing responsibility for institutional innovation on individual resilience alone.

2.6 Study Hypotheses

H1. Authentic leadership is positively related to innovative work behavior in higher education.

H2. Authentic leadership is positively related to employee resilience in higher education.

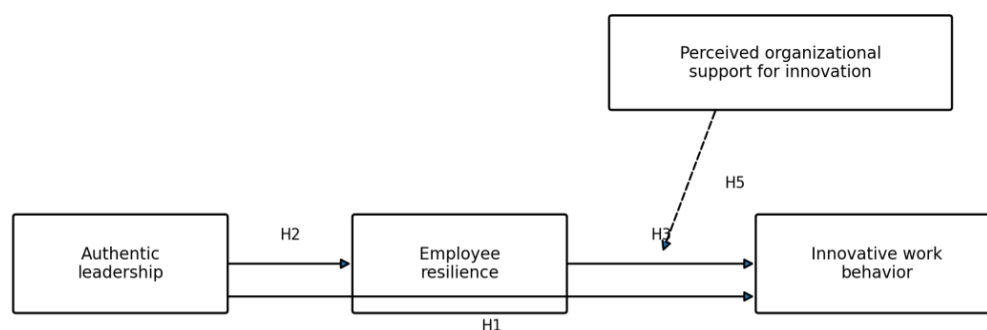
H3. Employee resilience is positively related to innovative work behavior in higher education.

H4. Employee resilience statistically mediates the relationship between authentic leadership and innovative work behavior.

H5. Perceived organizational support for innovation positively moderates the employee resilience–innovative work behavior relationship; consequently, the indirect relationship between authentic leadership and innovative work behavior through resilience is stronger at higher levels of support.

2.7 Research Gap and Theoretical Model

The specific gap is limited evidence on whether resilience carries part of the authentic leadership–innovation relationship among both academic and professional higher education employees and whether perceived institutional support activates this mechanism. Prior research commonly examines direct leadership effects, individual resources, or innovation climate in separate models. The study framework integrates them while retaining an individual level of analysis and explicitly testing a conditional indirect effect.



H4: Employee resilience mediates the authentic leadership–innovative work behavior relationship.

Conditional indirect effect: the mediated pathway varies with perceived organizational support for innovation.

Figure 1: Hypothesized moderated mediation model

3. Methodology

This study used a quantitative, cross-sectional, self-report survey design at the individual employee level to examine the relationships among authentic leadership, employee resilience, perceived organizational support for innovation, and innovative work behaviour. The target population comprised higher-education employees, including academic staff, academic managers, and administrative/professional staff. The unit of analysis was the individual employee because innovative work behaviour refers to the employee's own idea generation, idea promotion, and idea implementation.

3.1 Research Context, Population, and Sample

The final analytical sample comprised 412 employees from public, private, and applied/technical universities. The sample included academic and professional roles involved in teaching, research, student support, digital services, quality assurance, and institutional coordination. Demographic and institutional variables—gender, age, role, tenure, education, and institution type—were used in sensitivity or subgroup analyses rather than as focal explanatory variables.

3.3.1 Questionnaire and Measurement

Data were collected using a structured self-administered questionnaire. The instrument used a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Authentic leadership was measured with eight indicators, employee resilience with nine indicators, perceived organizational support for innovation with six indicators, and innovative work behaviour with eight indicators. The administered item inventory is reproduced in Appendix A. The measurement sources and adaptation logic are summarized in Table 2.

All four constructs were specified reflectively because the indicators were treated as manifestations of underlying employee perceptions or behaviour and were expected to covary. Perceived organizational support for innovation was interpreted at the individual level as perceived support rather than as an aggregated institutional climate. The reflective measurement model was evaluated through indicator reliability, internal consistency, convergent validity, cross-loadings, and heterotrait-monotrait inference (Hair et al., 2020; Henseler et al., 2015).

Table 2 : Questionnaire profile and measurement sources

Variable	Items	Scale	Source/adaptation
Authentic leadership (AL)	8	Five-point Likert	Walumbwa et al. (2008); contextual wording adapted for the higher-education setting
Employee resilience (ER)	9	Five-point Likert	Kuntz et al. (2017); Näswall et al. (2019)
Perceived organizational support for innovation (OSI)	6	Five-point Likert	Lukeš and Stephan (2017); Bos-Nehles and Veenendaal (2019)
Innovative work behavior (IWB)	8	Five-point Likert	Lukeš and Stephan (2017); Bai et al. (2022)

3.2 Data Collection, Anonymity, and Ethics

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. All participants provided informed consent prior to participating in the survey. The survey was completely anonymous, and no personally identifiable data were collected, ensuring the confidentiality and privacy of all respondents.

3.2.1 Data Screening and Common-Method Procedures

The analytical dataset contained four reflective latent variables: authentic leadership, employee resilience, organizational support for innovation, and innovative work behaviour. Item scores were coded on the five-point response scale. Screening identified 412 retained cases, no missing item values, no duplicate rows, no straight-line response patterns, no item z score exceeding $|3.29|$, and no multivariate case exceeding the $p < .001$ Mahalanobis distance threshold. Composite skewness ranged from .114 to $-.203$ and excess kurtosis from .535 to .026, indicating no severe univariate non-normality.

Procedural remedies included anonymity, neutral wording, separation of construct blocks, and clarification that there were no right or wrong responses. Statistical diagnostics were interpreted as evidence against, rather than proof of the absence of, common-method bias. Harman's first factor explained 41.32% of the unrotated variance, and full-collinearity variance inflation factors ranged from 1.396 to 3.074, below the conservative 3.3 diagnostic threshold. Same-source and cross-sectional measurement nevertheless remains a limitation (Kock, 2015; Podsakoff et al., 2003).

3.2.2 PLS-SEM Rationale and Analysis Procedure

Partial least squares structural equation modeling (PLS-SEM) was selected because the study combines prediction-oriented objectives with a mediated path, an interaction term, conditional indirect effects, and exploratory subgroup and predictive assessments. PLS-SEM was therefore used for its fit with the model's prediction emphasis and interaction complexity rather than because of sample size alone (Hair et al., 2019, 2020). The analyses were conducted using SmartPLS

and ADANCO. The ER $\times$ OSI interaction was formed from standardized scores using a two-stage product approach, and 5,000 bootstrap resamples generated standard errors and percentile 95% confidence intervals. The measurement model was assessed using indicator loadings, Cronbach's alpha, rho_A, composite reliability, average variance extracted, cross-loadings, and HTMT with bootstrapped confidence intervals. Structural assessment covered inner collinearity, standardized path estimates, confidence intervals, R^2 , f^2 , Q^2 predict, and a repeated ten-fold PLSpredict comparison with linear-model benchmarks. Robustness checks added gender, age, role, tenure, education, and institution type as controls and used exploratory multigroup analysis after measurement-invariance checks. Because IWB did not achieve compositional invariance in all comparisons, subgroup path differences were interpreted cautiously (Hair et al., 2021; Henseler et al., 2016; Shmueli et al., 2019).

3.3 Sample Profile

Table 3: Demographic profile of the analytical sample (N = 412)

Variable	Category	n	%
Gender	Female	214	51.9
Gender	Male	188	45.6
Gender	Prefer not to say	10	2.4
Age	25–34 years	92	22.3
Age	35–44 years	148	35.9
Age	45–54 years	114	27.7
Age	55+ years	58	14.1
Role	Academic staff	233	56.6
Role	Administrative/professional staff	137	33.3
Role	Academic manager	42	10.2
Institution type	Public university	223	54.1
Institution type	Private university	122	29.6
Institution type	Applied/technical university	67	16.3
Tenure	Less than 3 years	72	17.5
Tenure	3–5 years	126	30.6
Tenure	6–10 years	125	30.3
Tenure	More than 10 years	89	21.6
Education	Bachelor	87	21.1
Education	Master	162	39.3
Education	Doctorate	163	39.6

Table 4: Descriptive statistics and correlations

Construct	M	SD	AL	ER	OSI	IWB
Authentic leadership	3.286	.635	1.000	.624	.375	.682
Employee resilience	3.275	.633	.624	1.000	.303	.727
Perceived innovation support	3.271	.676	.375	.303	1.000	.519
Innovative work behavior	3.299	.632	.682	.727	.519	1.000

3.4 Measurement Model

Table 5: Reliability and convergent validity

Construct	α	rhoA	CR	AVE	Loading range
Authentic leadership	.906	.918	.924	.605	.742–.821
Employee resilience	.908	.919	.925	.578	.702–.802
Perceived innovation support	.899	.912	.923	.666	.782–.850
Innovative work behavior	.907	.919	.925	.608	.732–.827

Cronbach's alpha and composite reliability values ranged from .899 to .925, AVE values ranged from .578 to .666, and all primary loadings were at least .702. The reliability and convergent-validity results therefore met conventional thresholds. Appendix B reports the complete cross-loading matrix.

Table 6: HTMT values with bootstrapped 95% confidence intervals

Construct pair	HTMT	95% CI
AL-ER	.689	[.628, .743]
AL-OSI	.416	[.323, .510]
AL-IWB	.752	[.697, .802]
ER-OSI	.340	[.245, .433]
ER-IWB	.801	[.753, .844]
OSI-IWB	.575	[.499, .647]

All HTMT estimates and upper confidence limits were below .85. The highest value was ER-IWB (HTMT = .801, upper CI = .844), indicating that the constructs were strongly related yet empirically distinguishable (Henseler et al., 2015).

3.5 Common-Method and Collinearity Diagnostics

Table 7: Common-method and structural collinearity diagnostics

Diagnostic	Value	Interpretation
Harman first-factor variance	41.32%	Below 50%; descriptive diagnostic only
Full-collinearity VIF: AL	2.010	Below 3.3
Full-collinearity VIF: ER	2.309	Below 3.3
Full-collinearity VIF: OSI	1.396	Below 3.3
Full-collinearity VIF: IWB	3.074	Below 3.3
Inner VIF: AL	1.745	Below 3.0
Inner VIF: ER	1.655	Below 3.0
Inner VIF: OSI	1.179	Below 3.0
Inner VIF: ER × OSI	1.004	Below 3.0

The common-method and collinearity diagnostics did not indicate severe problems. These diagnostics do not eliminate common-method bias because every focal variable was collected from the same respondent at one time; this limitation is retained in the interpretation.

3.5.1 Structural Model and Hypothesis Tests

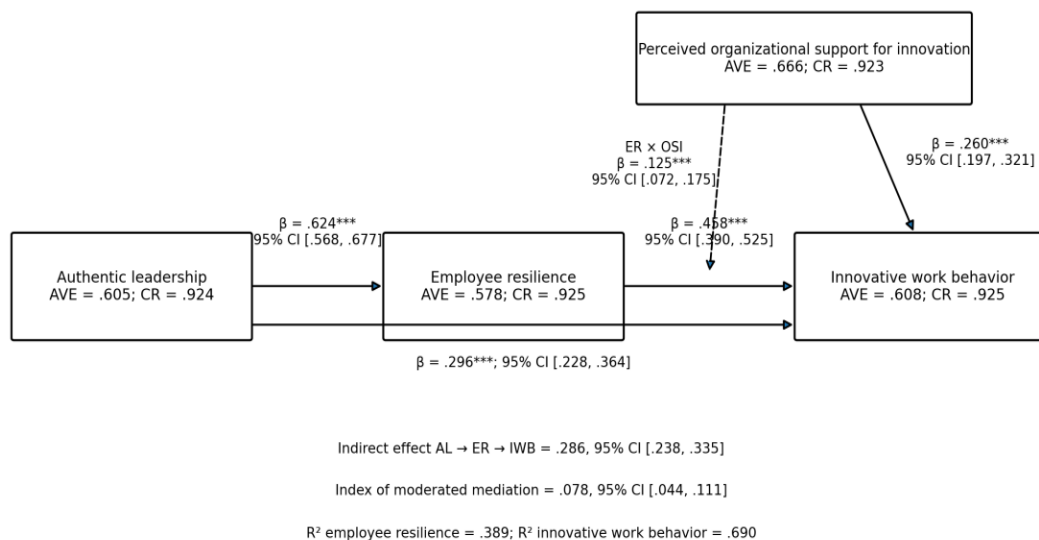


Figure 2: Estimated structural model with bootstrapped confidence intervals

Table 8: Direct, indirect, and moderation effect

Path	β	SE	t	p	95% CI	Decision
H1: AL $\rightarrow$ IWB	.296	.035	8.469	< .001	[.228, .364]	Supported
H2: AL $\rightarrow$ ER	.624	.028	22.127	< .001	[.568, .677]	Supported
H3: ER $\rightarrow$ IWB	.458	.035	13.269	< .001	[.390, .525]	Supported
H4: AL $\rightarrow$ ER $\rightarrow$ IWB	.286	.025	11.44	< .001	[.238, .335]	Supported
OSI $\rightarrow$ IWB	.260	.032	8.10	< .001	[.197, .321]	—
H5: ER $\times$ OSI $\rightarrow$ IWB	.125	.026	4.81	< .001	[.072, .175]	Supported
Index of moderated mediation	.078	.017	4.59	< .001	[.044, .111]	Supported

Every hypothesized estimate was positive and its bootstrapped confidence interval excluded zero. Authentic leadership was positively related to employee resilience and innovative work behaviour; resilience was positively related to innovative work behaviour; and the indirect AL-ER-IWB effect was significant. Perceived organizational support for innovation also had a positive main relationship with IWB, and the ER $\times$ OSI interaction was positive. These results provide statistical support for H1-H5 within the limits of the cross-sectional design.

Table 9: Effect sizes and explanatory power

Predictor relationship	f^2	Magnitude
AL $\rightarrow$ ER	.637	Large
AL $\rightarrow$ IWB	.162	Medium
ER $\rightarrow$ IWB	.408	Large
OSI $\rightarrow$ IWB	.185	Medium
ER $\times$ OSI $\rightarrow$ IWB	.048	Small

The f^2 results distinguish substantive magnitude from statistical significance. Employee resilience had the largest contribution to IWB ($f^2 = .408$), while authentic leadership and perceived innovation support had medium contributions and the interaction had a small incremental contribution. Authentic leadership explained 38.9% of the variance in ER, and the full model explained 69.0% of the variance in IWB.

3.5.2 Predictive Assessment

Table 10: PLSpredict item-level comparison with a linear benchmark

Indicator	PLS RMSE	LM RMSE	PLS MAE	LM MAE	Lower RMSE
IWB1	0.659	0.656	0.517	0.513	Linear benchmark
IWB2	0.617	0.613	0.484	0.480	Linear benchmark
IWB3	0.598	0.593	0.470	0.469	Linear benchmark
IWB4	0.615	0.610	0.497	0.494	Linear benchmark
IWB5	0.672	0.668	0.536	0.534	Linear benchmark
IWB6	0.604	0.598	0.472	0.466	Linear benchmark
IWB7	0.645	0.640	0.517	0.514	Linear benchmark
IWB8	0.605	0.596	0.481	0.474	Linear benchmark

The original Q^2_{predict} values were positive for ER (.371) and IWB (.506), indicating predictive relevance relative to a naive mean benchmark. However, the repeated ten-fold item-level comparison showed slightly lower RMSE for the linear benchmark on all eight IWB indicators. The model is therefore described as having low-to-moderate out-of-sample predictive power rather than as outperforming a linear alternative (Shmueli et al., 2019).

3.5.3 Moderation and Conditional Indirect Effects

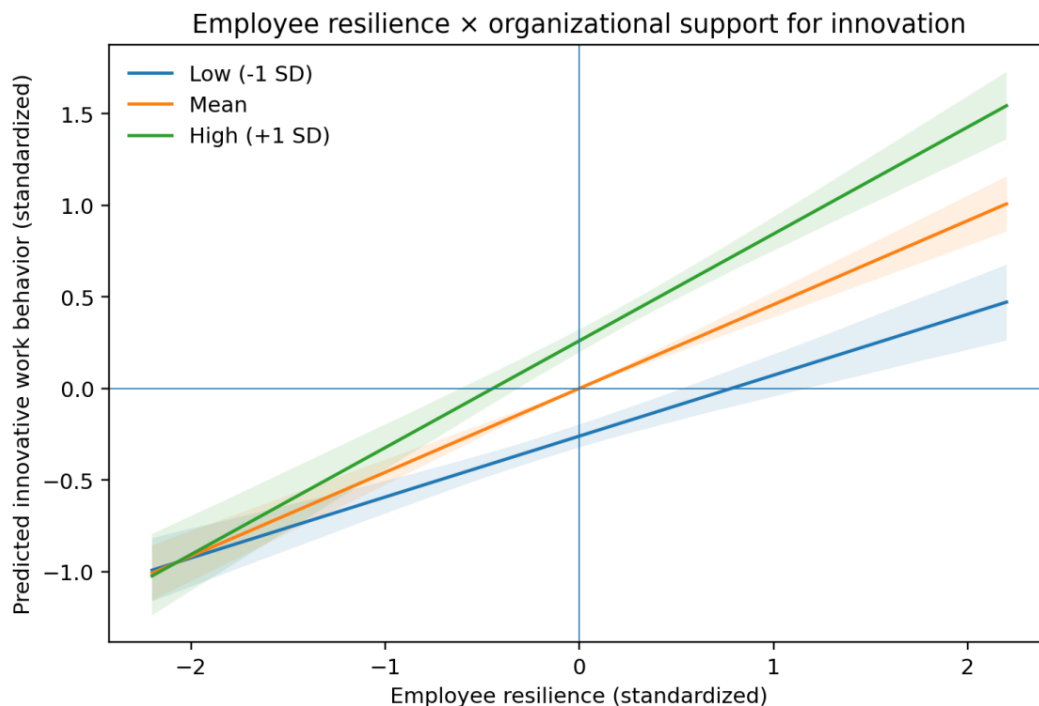


Figure 3: Simple slopes of employee resilience at low, mean, and high perceived innovation support

Table 11: Conditional effects across levels of perceived innovation support

OSI level	ER → IWB	95% CI	AL → ER → IWB	95% CI
Low (−1 SD)	.332	[.251, .413]	.207	[.156, .262]
Mean	.458	[.390, .525]	.286	[.238, .335]
High (+1 SD)	.583	[.494, .670]	.364	[.302, .428]

The ER-IWB slope increased from .332 at low OSI to .583 at high OSI. The conditional indirect effect likewise increased from .207 to .364, and the index of moderated mediation was .078 (95% CI [.044, .111]). Thus, the statistical relationship between resilience and innovative work behaviour was stronger at higher perceived innovation support, while the conditional indirect relationship was positive at all three support levels.

3.5.4 Robustness and Multigroup Analyses

Adding gender, age, role, tenure, education, and institution type as controls produced nearly unchanged focal estimates: AL β = .301, ER β = .455, OSI β = .251, and ER $\times$ OSI β = .138 (all p < .001). The controlled model explained 70.9% of IWB, compared with 69.0% in the parsimonious model. No path difference reached p < .05 across role, institution type, or gender. MICOM established compositional invariance for AL, ER, and OSI but not consistently for IWB; the subgroup results are therefore interpreted as exploratory rather than definitive evidence of equivalence.

Table 12: Exploratory multigroup analysis

Comparison	Path	Group 1 β	Group 2 β	Difference	p
Academic vs. non-academic role	AL->ER	0.632	0.604	0.028	0.666
Academic vs. non-academic role	AL->IWB	0.299	0.284	0.015	0.826
Academic vs. non-academic role	ER->IWB	0.473	0.439	0.034	0.651
Academic vs. non-academic role	OSI->IWB	0.238	0.294	-0.056	0.407
Academic vs. non-academic role	ER $\times$ OSI->IWB	0.154	0.055	0.099	0.108
Public vs. Non-public institution	AL->ER	0.637	0.608	0.029	0.635
Public vs. Non-public institution	AL->IWB	0.306	0.288	0.019	0.750
Public vs. Non-public institution	ER->IWB	0.474	0.433	0.041	0.551

Comparison	Path	Group 1 β	Group 2 β	Difference	p
Public vs. Non-public institution	OSI->IWB	0.234	0.294	-0.061	0.316
Public vs. Non-public institution	ERxOSI->IWB	0.118	0.138	-0.021	0.674
Female vs. male	AL->ER	0.605	0.645	-0.040	0.453
Female vs. male	AL->IWB	0.254	0.326	-0.072	0.288
Female vs. male	ER->IWB	0.495	0.429	0.067	0.356
Female vs. male	OSI->IWB	0.240	0.295	-0.055	0.414
Female vs. male	ERxOSI->IWB	0.139	0.102	0.037	0.475

Note. Subgroup comparisons are exploratory. IWB did not achieve compositional invariance in all comparisons; non-significant differences should not be interpreted as proof of equivalence.

4. Discussion

The findings support an integrated resource explanation of employee innovation in higher education. Authentic leadership was positively related to innovative work behaviour and employee resilience; resilience statistically carried part of the leadership-innovation relationship; and perceived organizational support for innovation strengthened both the ER-IWB relationship and the conditional indirect relationship. The contribution lies in this configuration rather than in any single coefficient: leadership, adaptive capacity, and perceived institutional support operate as complementary components of the model.

4.1 Authentic Leadership and Innovative Work Behaviour

The H1 result is consistent with studies linking authentic or related relational leadership approaches with innovative and service-innovative behaviour through engagement, proactive personality, knowledge sharing, and supportive climate. In higher education, transparent communication, balanced processing, and ethical consistency may make questioning routines and championing ideas safer (Bai et al., 2022; Elrehail et al., 2018). The interpretation remains bounded by conceptual overlap: the study does not establish authentic leadership as superior to transformational, ethical, inclusive, servant, or distributed leadership, and trust or voice may represent broader mechanisms rather than unique properties of one leadership label (Banks et al., 2016; Gardner et al., 2021).

4.2 Authentic Leadership and Employee Resilience

H2 represented the strongest direct path in the model. Employees who reported higher authentic leadership also reported greater resilience, which is consistent with a resource-based view of resilience as partly embedded in social and organizational conditions. Honest explanations, acknowledgment of constraints, respectful treatment, and fair decision processes may reduce avoidable uncertainty and help employees preserve confidence during change. The pattern aligns with research linking authentic leadership with resilience through perceived insider status, error-management climate, trust, flow, and

organizational identification (Li & Zhang, 2022; Mao et al., 2023). This interpretation cautions against resilience programs that focus only on individual coping.

4.3 Employee Resilience, Mediation, and Innovative Work Behavior

H3 and H4 indicate that resilience was the most practically important predictor of IWB and a significant statistical mediator. Innovative work requires employees to revise ideas, persist after criticism, and use feedback rather than treating setbacks as terminal. The direct AL-IWB relationship remained significant after ER was included, indicating partial mediation. Leadership may therefore relate to innovation both through resilience and through parallel routes such as voice legitimacy, engagement, psychological safety, trust, proactive personality, or knowledge sharing. The cross-sectional design does not establish temporal or causal mediation (Caniëls & Baaten, 2019; Hartmann et al., 2020; Newman et al., 2017).

4.4 Moderation, Low-Support Conditions, and Academic Management

H5 provides a boundary-condition result. At low perceived innovation support, the ER-IWB relationship remained positive, but the slope and conditional indirect effect were smaller than at mean and high support. Resilient employees may continue functioning in weak-support environments, yet they may use adaptive resources to absorb bureaucracy rather than to implement innovation. This distinction is important because resilience should not become a rationale for asking employees to innovate without time, tools, recognition, psychological safety, or decision access. The result is consistent with research showing that innovation-support and knowledge-sharing conditions shape whether employee motivation is translated into innovative action (Bos-Nehles & Veenendaal, 2019; Chen & Chang, 2025).

Academic managers merit particular attention because they occupy a hybrid position. They may be evaluated as leaders while depending on senior policies for workload relief, seed funding, digital infrastructure, and approval. Their role can involve translating institutional resources into locally accessible support and communicating constraints upward. The exploratory MGA did not identify statistically significant structural differences between academic and non-academic groups, but incomplete IWB invariance means that subgroup comparisons should remain cautious.

4.5 Original Contribution

The study offers a higher-education-specific conditional-process explanation. First, it treats authentic leadership as a social and informational resource rather than assuming a universal leadership effect. Second, it positions employee resilience as a behavioural resource that supports implementation, not merely wellbeing or recovery. Third, it identifies perceived organizational support for innovation as a condition under which the resilience-innovation relationship is stronger. Fourth, the study includes academic, professional, and management employees and reports common-method, predictive, control-variable, and subgroup diagnostics that qualify the main findings. The contribution therefore

lies in theoretical integration, mechanism specification, and boundary-sensitive interpretation rather than in claiming that the focal constructs are new.

5. Conclusion

This study examined a moderated mediation model of innovative work behaviour in higher education. Authentic leadership was positively related to both employee resilience and innovative work behaviour, and resilience statistically carried a substantial part of the leadership–innovation relationship. Perceived organizational support for innovation strengthened the resilience–innovation relationship and increased the conditional indirect relationship of leadership with innovative work behaviour through resilience. The pattern suggests that employee innovation is better understood as the alignment of relational leadership, adaptive capacity, and an enabling organizational context than as the product of any single factor.

Effect-size estimates showed that resilience made the largest contribution to innovative work behaviour, while authentic leadership and innovation support made medium contributions and their interaction added a smaller but meaningful increment. The findings are relevant to academic, professional, and management work, yet they remain cross-sectional, self-reported associations and should not be interpreted as causal effects. The practical implication is that universities should align leadership behaviour, resilience-supporting work design, and credible innovation support so that employee initiative has a realistic route to implementation. Longitudinal and multi-source research is needed to establish temporal ordering and test whether these relationships generalize across institutional and national settings.

6. Implications of the Study

6.1 Theoretical and Methodological Implications

Theoretically, the model connects relational leadership, resource preservation, work design, and reciprocity. It clarifies why the leadership–innovation relationship is more informative when interpreted through both employee adaptive capacity and organizational opportunity. Methodologically, the analysis demonstrates the value of reporting HTMT inference, collinearity, effect sizes, simple slopes, conditional indirect effects, prediction benchmarks, controls, and measurement invariance rather than relying on path significance alone. The findings should nevertheless be interpreted as cross-sectional associations, not as causal effects.

6.2 Practical Implementation

The findings support a phased approach to implementation. Institutions can begin with relatively low-cost practices such as leadership listening routines, transparent decision processes, post-project learning reviews, and systematic identification of barriers to idea implementation. Subsequent initiatives can include mentoring, protected experimentation time, peer learning, small seed grants, and explicit recognition of innovation activity in workload and promotion systems. Decisions to scale these practices should be informed by local implementation evidence, cost, uptake, and measurable outcomes.

Employee needs may differ by career stage and role. Junior staff may benefit from mentoring, psychological safety, procedural guidance, and protected time; senior staff may need autonomy and authority to sponsor ideas; professional staff may need access to decision forums and recognition equal to academic innovation; and academic managers may need budget discretion and escalation channels. Digital tools can support these practices through idea-management portals, collaborative project spaces, and testing sandboxes, but technology cannot substitute for trustworthy governance.

7. Limitations and Future Research Directions

The study has four principal limitations. First, the cross-sectional design cannot establish temporal precedence, so statistical mediation and moderated mediation do not demonstrate causal sequences. Second, all focal variables were reported by the same respondents, leaving residual common-method and social-desirability risk despite procedural and statistical diagnostics. Third, the sample spans several employee and institution categories, but the design does not establish population representativeness beyond the study context. Fourth, IWB did not achieve compositional invariance in all exploratory subgroup comparisons, so the absence of detected role, institution, or gender differences should be interpreted cautiously.

Future research should use time-lagged or longitudinal designs, supervisor or peer ratings, objective indicators of implemented innovation, and qualitative process evidence to test temporal ordering and alternative mechanisms. Comparative studies should establish measurement invariance and adequate subgroup sizes before drawing strong group-level conclusions.

Conflict of Interest and Funding

The authors declare no conflict of interest. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

8. Ethics Statement and Informed Consent

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. All participants provided informed consent prior to participating in the survey. The survey was completely anonymous, and no personally identifiable data were collected, ensuring the confidentiality and privacy of all respondents.

9. Data Availability Statement

The data underlying the findings of this study are not publicly available. De-identified study data may be made available by the corresponding author upon reasonable request, subject to applicable ethical and institutional requirements.

10. Acknowledgments and Use of AI

The authors sincerely thank all higher-education employees who voluntarily participated in this study and contributed their time and responses to the research. OpenAI's ChatGPT was used solely to assist with English-language editing, sentence restructuring, consistency checking, and manuscript organization.

during the revision process. The tool was not used to generate or alter the primary research data, conduct the statistical analyses, fabricate references, or determine the study findings or conclusions. All AI-assisted content was critically reviewed, revised, and verified by the authors, who remain fully responsible for the accuracy, integrity, originality, and final content of the manuscript.

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Appendices

Appendix A: Administered Questionnaire Item Inventory

The following items reproduce the administered questionnaire used in the study. All items used a five-point Likert response scale from 1 (strongly disagree) to 5 (strongly agree).

Code	Working item wording
AL1	My immediate leader openly shares relevant information when making decisions.
AL2	My immediate leader admits mistakes and acknowledges personal limitations.
AL3	My immediate leader encourages views that challenge their preferred position.
AL4	My immediate leader considers different evidence before reaching a decision.
AL5	My immediate leader acts consistently with stated ethical values.
AL6	My immediate leader explains the values that guide difficult decisions.
AL7	My immediate leader seeks feedback about how their behavior affects others.
AL8	My immediate leader communicates honestly about institutional constraints.
ER1	I adapt effectively when unexpected changes affect my work.
ER2	I learn useful lessons from difficult work experiences.
ER3	I continue working toward important goals after setbacks.
ER4	I seek feedback when a work problem requires a new approach.
ER5	I draw on colleagues and professional networks when facing difficulty.
ER6	I reorganize my work when priorities or resources change.
ER7	I remain effective when a new system or procedure is introduced.
ER8	I use previous challenges to improve how I handle later problems.
ER9	I recover constructively after an idea or project is unsuccessful.
OSI1	My institution encourages employees to propose new ideas.
OSI2	My institution provides resources for trying promising ideas.
OSI3	My institution gives employees reasonable autonomy to experiment.
OSI4	My institution supports collaboration across units on new initiatives.
OSI5	My institution recognizes employees who improve teaching, research, or services.
OSI6	My institution treats responsible experimentation and well-intentioned failure as opportunities for learning.

Code	Working item wording
IWB1	I actively search for new ways to improve my work.
IWB2	I generate original solutions to work-related problems.
IWB3	I discuss promising ideas with colleagues who can help develop them.
IWB4	I build support for new ideas among relevant decision makers.
IWB5	I obtain resources or cooperation needed to test an idea.
IWB6	I turn useful ideas into practical changes.
IWB7	I evaluate and refine new practices after implementation.
IWB8	I help embed successful innovations into routine work.

6.3 Appendix B: Complete Cross-Loading Matrix

Indicator	AL	ER	OSI	IWB
AL1	0.747	0.445	0.293	0.527
AL2	0.802	0.507	0.307	0.549
AL3	0.785	0.465	0.346	0.538
AL4	0.821	0.549	0.279	0.586
AL5	0.754	0.469	0.258	0.498
AL6	0.742	0.466	0.346	0.525
AL7	0.793	0.473	0.275	0.510
AL8	0.774	0.506	0.232	0.509
ER1	0.463	0.702	0.241	0.515
ER2	0.513	0.784	0.237	0.557
ER3	0.540	0.802	0.310	0.633
ER4	0.434	0.757	0.242	0.524
ER5	0.459	0.778	0.183	0.545
ER6	0.477	0.782	0.251	0.565
ER7	0.440	0.735	0.205	0.531
ER8	0.461	0.758	0.194	0.542
ER9	0.485	0.741	0.237	0.560
OSI1	0.283	0.241	0.782	0.391
OSI2	0.331	0.268	0.830	0.457
OSI3	0.318	0.261	0.850	0.446
OSI4	0.304	0.223	0.821	0.409
OSI5	0.259	0.252	0.825	0.408

Indicator	AL	ER	OSI	IWB
OSI6	0.343	0.255	0.784	0.430
IWB1	0.452	0.584	0.339	0.757
IWB2	0.576	0.538	0.451	0.788
IWB3	0.564	0.589	0.411	0.795
IWB4	0.537	0.567	0.432	0.782
IWB5	0.489	0.561	0.352	0.768
IWB6	0.599	0.617	0.444	0.827
IWB7	0.496	0.508	0.411	0.732
IWB8	0.539	0.564	0.399	0.783

Note. The largest loading in each row corresponds to the intended construct.