JOURNAL OF CULTURAL ANALYSIS AND SOCIAL CHANGE

Journal of Cultural Analysis and Social Change,
2025, 10(2), 1516-1526
ISSN: 2589-1316

Evaluation of Instruments for the Study of Organizational Behavior in University-Level Higher Education

Emilio Flores-Mamani [1]*, Constantino-Miguel Nieves-Barreto[2], Ányela-Yésica Flores Yapuchura[3], Rolando-Esteban Rodríguez-Huamani[4], Madison Huarcaya-Godoy[5], Zoraima-Julieta Laura-Castillo[6]

[1] *Universidad Nacional del Altiplano, Perú, Orcid: https://orcid.org/0000-0002-0317-6867*
[2] *Universidad Nacional del Callao, Perú, E-mail: cmnievesb@unac.edu.pe, Orcid: https://orcid.org/0000-0002-9144-4517*
[3] *Universidad Nacional del Callao, Perú, E-mail: ayfloresy@unac.edu.pe, Orcid: https://orcid.org/0000-0002-9934-4609*
[4] *Universidad Nacional del Altiplano, Perú, E mail: rrodrigues@unap.edu.pe, Orcid: https://orcid.org/0000-0003-2623-9127*
[5] *Universidad Nacional del Callao, Perú, e- mail: mhuarcayag@unac.edu.pe, Orcid: https://orcid.org/0000-0003-0063-8787*
[6] *Universidad Nacional del Altiplano, Perú, E -mail: zjlaura@unap.edu.pe, Orcid: https://orcid.org/0000-0001-7460-6740*

*__Corresponding Author:__ emilioflores@unap.edu.pe

Citation: Flores-Mamani, E., Nieves-Barreto, C. M., Yapuchura, A. Y. F., Rodríguez-Huamani, R. E., Huarcaya-Godoy, M. and Laura-Castillo, Z. J. (2025). Evaluation of Instruments for the Study of Organizational Behavior in University-Level Higher Education, *Journal of Cultural Analysis and Social Change*, 10(2), 1516-1526. https://doi.org/10.64753/jcasc.v10i2.1851

Published: November 14, 2025

ABSTRACT

The objective of this study was to analyze the underlying structure of a set of organizational variables through exploratory factor analysis. The research adopted a quantitative, non-experimental, cross-sectional design, applied to a non-probabilistic sample of faculty members from a public university in the Puno region, Peru. Data collection employed previously validated scales, and their internal consistency was assessed using Cronbach's Alpha coefficient. The results showed a sampling adequacy index of KMO = .814 and a significant Bartlett's test of sphericity ($p < .001$), confirming the suitability of the factorial model. Six principal components were identified that explain the structure of the analyzed constructs, four of which presented adequate reliability (α between .794 and .887), while two showed low values (α = .624 and α = .452). These findings highlight the relevance of the organizational factors studied as strategic axes for institutional alignment, talent retention, and the promotion of workplace well-being. The study provides empirical evidence on the validity and reliability of the scales used, pointing out the need for refinement in some factors and suggesting future research to further validate them in different contexts.

Keywords: Internal Marketing, Organizational Commitment, Work Climate, Factor Analysis, Reliability.

INTRODUCTION

In recent years, the study of organizational variables within the university setting has gained significant relevance due to their direct impact on employee motivation, productivity, and job satisfaction (Meyer and Morin, 2016). Higher education institutions are confronted with a context marked by structural changes, increasing demands for academic quality, and the pressing need to strengthen talent retention, making it essential to evaluate employees' perceptions of their institution (Espino Wuffarden et al., 2023). Within this framework, the psychometric analysis of instruments that adequately measure these constructs is crucial to ensure valid and reliable empirical evidence that can support institutional decision-making

At the international level, several studies have confirmed the importance of employing robust measurement instruments to assess variables such as commitment, institutional loyalty, and professional development in

academic contexts (Öksüz Gül and Çetin, 2022; Faisaluddin et al., 2023). In the Latin American context, progress has been made in the validation of scales measuring factors related to organizational climate and job satisfaction; however, the findings highlight the need to continue validation processes and cultural adaptation of these instruments (López et al., 2019). Psychometrics applied to higher education thus emerges as a strategic field for consolidating evidence-based human talent management policies.

In Peru, several recent studies have contributed to the understanding of these dynamics. For instance, Olórtegui et al. (2024) examined the relationship between employer branding and organizational commitment in a sample of Peruvian workers, reporting significant associations with high internal reliability. Similarly, Flores-Jiménez et al. (2016) validated the factorial structure of the Utrecht Work Engagement Scale (UWES) among university faculty in Lima, confirming the applicability of international scales in the local context. In the same vein, Damiano-Aulla et al. (2024) adapted an organizational climate scale for healthcare workers, demonstrating adequate internal consistency and confirmatory factorial validity. Finally, Mamani-Benito et al. (2023) developed and validated the EMP-AC Scale (Motivation to Publish in Open Access in Academia Scale) to assess motivation toward scientific publishing among Peruvian university students, employing both exploratory and confirmatory factor analyses. These contributions reflect a growing interest in the validation of psychometric instruments in the country.

Nevertheless, significant gaps persist in the national literature. Most of the aforementioned studies focus on specific variables (work climate, academic motivation, job commitment), on delimited populations such as faculty or students, and within particular sectoral contexts, such as healthcare. In contrast, there is a notable scarcity of studies that comprehensively address, through exploratory factor analysis, the dimensions of institutional commitment, pride and loyalty, work climate, and professional development among university faculty. This gap limits the availability of culturally adapted and validated scales within the Peruvian context, thereby restricting the formulation of university management policies grounded in robust empirical evidence.

In this regard, the present study aims to evaluate the psychometric properties and construct validity of a set of items designed to measure institutional commitment, internal human talent management, and work climate among university faculty, through exploratory factor analysis (EFA). In doing so, it seeks to contribute to the field of psychometrics applied to higher education in the country, fill a gap in the national academic literature, and generate empirical evidence to support universities in improving their human capital management policies.

THEORETICAL FRAMEWORK

Internal Marketing in Higher Education Institutions

Internal Marketing (IM) is understood as the set of organizational practices that treat employees as internal clients, with the aim of aligning attitudes, competencies, and behaviors toward the delivery of services consistent with the institutional promise. In the university context, IM encompasses internal communication, training and professional development, recognition, and opportunities for career advancement, and is conceived as a lever to improve service quality and the satisfaction of both students and academic staff. Studies conducted in higher education show that well-designed IM practices increase staff job satisfaction, facilitate student orientation, and enhance institutional loyalty (Ahmed and Imran, 2023).

Recurrent dimensions in the literature on Internal Marketing (IM) in universities include communication and role clarity, training and professional development, recognition and rewards, participation and empowerment, and working conditions or compensation. These dimensions explain why IM can function both as a direct antecedent of organizational commitment and as a mediator between institutional policies and individual outcomes (Sarquis et al., 2020).

Organizational Commitment: Nature and Components

Organizational commitment constitutes a psychological bond between the employee and the institution, expressed through the desire to remain, the willingness to exert effort, and the acceptance of organizational goals. The three-component model (affective, continuance, and normative) remains a useful framework for distinguishing the reasons why an employee stays in the organization: wanting to stay (affective), needing to stay (continuance), and feeling obliged to stay (normative) (Meyer and Morin, 2016).

Empirical evidence indicates that affective commitment is consistently associated with better outcomes (higher performance, lower turnover intention, and greater well-being), whereas non-affective forms show less predictable relationships and, in some cases, contradictory effects on health and work behavior (Meyer and Morin, 2016). Recent studies in Latin America have confirmed the relevance of these dimensions, highlighting that internal marketing and a positive perception of the work climate predict stronger organizational commitment (Durán Ponce, 2024).

Work Climate

Organizational climate is the shared perception of policies, practices, and procedures within the work environment; it encompasses subdimensions such as leadership, interpersonal trust, workload and task clarity, rewards and recognition, and social support. Recent systematic reviews reveal a proliferation of instruments designed to measure climate, but also point out psychometric limitations in many of them, which may affect both predictive and construct validity (Powell et al., 2021).

In universities, organizational climate influences both commitment and the effectiveness of institutional improvement initiatives: positive climates facilitate knowledge sharing, collaboration, and teaching-research innovation, whereas deteriorated climates foster isolation, conflict, and talent loss (Janiukštis et al., 2024). In the Peruvian context, recent scale validations confirm the importance of employing reliable and culturally appropriate instruments to assess climate (Damiano-Aulla et al., 2024).

Relationships among the Three Variables and the Need for Rigorous Factorial Analysis

The literature reports both theoretical and empirical relationships among internal marketing, organizational commitment, and work climate: IM positively influences commitment, and work climate acts as a moderator of this relationship (Sarquis et al., 2020). However, many studies employ adapted instruments without sufficient psychometric evidence for the local context, and few simultaneously address the three variables using robust factorial techniques in Latin American universities. This gap limits the practical applicability of recommendations for university management (Mamani-Benito et al., 2023; Powell et al., 2021).

METHODOLOGY

Design

A quantitative, non-experimental, cross-sectional, and exploratory study was conducted to identify the underlying factorial structure of three organizational variables: internal marketing, organizational commitment, and work climate. This approach is particularly suitable when the objective is to examine latent constructs without manipulating variables (Hernández-Sampieri et al., 2014). The research was carried out during the first semester of 2025.

Participants

The sample consisted of 309 faculty members from a public university in the Puno region, selected through non-probabilistic convenience sampling, a technique frequently employed in organizational studies (Otzen and Manterola, 2017). Faculty members with at least one year of tenure were included, while incomplete questionnaires were excluded.

Instruments

The questionnaire integrated three scales previously validated in the organizational domain:

1. **Internal Marketing Scale**, inspired by the propositions of Berry (1981) and recent adaptations in higher education (Vel et al., 2019), which measured internal communication, training, managerial support, and rewards.
2. **Organizational Commitment Scale**, based on the three-dimensional model of Meyer and Allen (1991), including items for affective, continuance, and normative commitment.
3. **Work Climate Scale**, grounded in studies on organizational culture and climate (Schneider et al., 2013), which included dimensions such as interpersonal relationships, leadership, recognition, and working conditions.

Items were rated on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Procedure

Data collection was conducted through both face-to-face and online modalities, following institutional

authorization and the provision of informed consent by participants. Anonymity and voluntary participation were safeguarded in accordance with the principles of the Declaration of Helsinki (World Medical Association, 2013).

Data Analysis

Data were processed using SPSS version 28. To assess the suitability of factor analysis, sampling adequacy tests were conducted. The KMO index = 0.814 indicated meritorious adequacy (Kaiser, 1960; Hair et al., 2019), while Bartlett's test of sphericity was significant (χ^2, $p < .000$), confirming the appropriateness of the correlation matrix. Exploratory factor analysis was performed using the principal components method with Varimax rotation and Kaiser normalization, following standard criteria in organizational psychology research (Tabachnick and Fidell, 2019). As a result, six components with eigenvalues greater than 1 were extracted, which explained a cumulative percentage of variance exceeding the minimum thresholds suggested in the literature (Hair et al., 2019). For item interpretation, only factor loadings above 0.40 were considered.
Finally, the internal reliability of each factor was assessed using Cronbach's alpha coefficient, with values ≥ 0.70 deemed acceptable (Nunnally and Bernstein, 1994).

RESULTS

Prior to conducting the exploratory factor analysis (EFA), the suitability of the technique was assessed. The KMO index was .814, indicating meritorious sampling adequacy, while Bartlett's test of sphericity was significant (χ^2 = 9563.67; df = 1225; $p < .001$), confirming that the correlation matrix was appropriate for data reduction (Hair et al., 2019; Kaiser, 1960).

Table 1 – KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy 0.814		
Bartlett's Test of Sphericity	Approx. Chi-Square	9563.672
	df	1225
	Sig.	0.000

The analysis, conducted using the principal components method with Varimax rotation and Kaiser normalization, yielded a six-component solution with eigenvalues greater than 1, jointly accounting for 52.63% of the total variance. Specifically, Component 1 explained 25.83% of the variance, Component 2 accounted for 8.45%, Component 3 for 5.87%, Component 4 for 5.05%, Component 5 for 3.80%, and Component 6 for 3.62% (Table 2).

Table 2. Total Variance Explained by the Six Components

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.916	25.833	25.833	12.916	25.833	25.833	6.094	12.187	12.187
2	4.229	8.457	34.290	4.229	8.457	34.290	5.152	10.304	22.492
3	2.933	5.867	40.157	2.933	5.867	40.157	4.821	9.642	32.134
4	2.527	5.055	45.211	2.527	5.055	45.211	3.950	7.899	40.033
5	1.900	3.800	49.011	1.900	3.800	49.011	3.413	6.825	46.858
6	1.813	3.626	52.637	1.813	3.626	52.637	2.889	5.779	52.637
7	1.467	2.934	55.571						
8	1.372	2.744	58.315						
9	1.328	2.657	60.972						
10	1.220	2.440	63.411						

11	1.177	2.354	65.766
12	1.115	2.229	67.995
13	1.021	2.042	70.037
14	0.977	1.954	71.992
15	0.917	1.833	73.825
16	0.861	1.721	75.547
17	0.851	1.703	77.249
18	0.782	1.564	78.813
19	0.738	1.476	80.289
20	0.665	1.331	81.620
21	0.640	1.279	82.899
22	0.607	1.215	84.114
23	0.555	1.109	85.223
24	0.538	1.077	86.299
25	0.477	0.953	87.253
26	0.471	0.942	88.195
27	0.449	0.898	89.094
28	0.426	0.852	89.945
29	0.405	0.809	90.754
30	0.391	0.782	91.537
31	0.377	0.754	92.291
32	0.357	0.714	93.005
33	0.339	0.677	93.683
34	0.319	0.638	94.320
35	0.298	0.596	94.916
36	0.283	0.566	95.482
37	0.268	0.535	96.017
38	0.232	0.464	96.481
39	0.217	0.434	96.915
40	0.206	0.412	97.327
41	0.198	0.397	97.724
42	0.169	0.339	98.062
43	0.162	0.323	98.386
44	0.152	0.305	98.690
45	0.139	0.279	98.969
46	0.131	0.262	99.232
47	0.113	0.225	99.457
48	0.101	0.202	99.658
49	0.098	0.197	99.855
50	0.072	0.145	100.000

Extraction Method: Principal Component Analysis

The Rotated Component Matrix revealed a coherent grouping of items into six differentiated dimensions, with factor loadings greater than 0.40, which reorganize the initial theoretical variables (internal marketing, organizational commitment, and work climate) into the following structures:

1. **Internal Communication and Support**: comprising 10 items related to organizational communication, managerial support, and the transmission of key information.

2. **Training and Development**: comprising 7 items associated with training opportunities, professional development programs, and continuous learning.

3. **Affective Commitment**: comprising 7 items reflecting emotional identification, pride, and a sense of belonging to the university.
4. **Interpersonal Relations Climate**: comprising 5 items related to trust, teamwork, and a friendly work environment.
5. **Normative and Continuance Commitment**: comprising 3 items expressing the moral obligation to remain in the organization and the perceived costs of leaving it.
6. **Recognition and Working Conditions**: comprising 3 items referring to fairness in rewards, performance appraisal, and working conditions.

Table 3. Rotated Component Matrix (Varimax with Kaiser Normalization)

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
-I feel "fully committed" and take pride in it.	0.717					
Working at this university means a lot to me.	0.712					
- I feel good working at the university.	0.676					
- The university where I work deserves my loyalty.	0.671					
- I feel that I owe a lot to the university.	0.644					
- Even if I wanted to, it is very difficult for me to leave my job.	0.638					
-I identify with the university's goals and values.	0.614					
-I would not leave the university because I feel a sense of obligation toward the people who work there.	0.580					
- The university deserves my loyalty.	0.528					
-I have invested time in the university, and leaving it would incur costs for me.	0.527					0.505
-I perceive the problems at my work as if they were my own.						
-At this university, tasks are well-defined and organized.						
-There are many excuses around here when someone makes a mistake.		0.798				
-One of the problems at this university is that staff do not take responsibility.		0.739				
-At this university, there is not much trust between supervisors and subordinates.		0.657				
-For this university to be superior to others, occasionally, one must take significant risks.		0.598				
-At this university, there is little trust in individuals' responsibility regarding their work.		0.598				
-At this university, good work is not sufficiently rewarded or recognized.		0.591				
-At this university, people tend to be indifferent and distant toward others.		0.578				

-At this university, supervisors provide general instructions on what should be done and leave the responsibility for specific tasks to the staff.				
-At this university, the staff do not seem to feel very proud of their own performance.				
-The best way to make a good impression is to avoid open arguments and disagreements.				
-In the current situation, staying at the university is both a necessity and a desire.				
-At this university, we are required to maintain a high level of performance in our work.				
-The launch of new programs or services is carried out first for university faculty and then for the broader university community.	0.676			
-The university has different programs to address the needs of faculty members.	0.629			
-The university ensures that activities are assigned based on each employee's competencies.	0.623			
-The university provides opportunities to generally enhance my knowledge.	0.619			
The university provides opportunities for supplemental pay.	0.615			
-The university trains me to perform better in my activities.	0.573			
-Changes that will occur at the university are communicated in advance.	0.540			
-I am aware of the university's results.				
-At this university, those who perform best in their work can attain the top positions.				
Among the staff at this university, a friendly environment predominates.		0.764		
-This university is characterized by a comfortable and relaxed work climate.		0.689		
-At this university, for a task to be done well, it must be carried out with boldness, responsibility, and initiative.		0.680		
-At this university, the better the work performed, the greater the recognition received.		0.643		
-At this university, when I have to complete a difficult task, I can rely on the support of my supervisor and colleagues.		0.527		
-At this university, the administration continuously emphasizes that we improve our individual and group work.				
-We are encouraged to express our opinions, even when we disagree with our supervisors.			0.636	
-At this university, decision-making is carried out cautiously to achieve the proposed objectives.			0.514	

-At the university, I feel like part of a family.	0.514
-I feel at home at the university where I work.	
-At the university, it is not necessary to ask for permission to do everything.	0.595
-At this university, supervisors are not very understanding when a mistake is made.	0.536
-If I decided to leave my job, many aspects of my personal life would be disrupted.	0.525
-At this university, the rewards and encouragement you receive usually outweigh threats and criticism.	
-At this university, most of my colleagues are more concerned with their own interests.	
-At this university, an employee's personal traits are valued more than their work performance.	
-Even if it were advantageous for me, it would not be right to leave the university now.	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.[a]
[a] Rotation converged in 15 iterations.

Finally, the component transformation matrix showed moderate correlations among the six factors, supporting their relative independence while also demonstrating coherence within the same factorial model (Table 4).

Table 4 – Component Transformation Matrix

Component Transformation Matrix

Component	1	2	3	4	5	6
1	0.584	0.374	0.505	0.355	0.330	0.173
2	-0.237	0.832	-0.239	-0.077	-0.259	0.348
3	-0.541	0.000	-0.118	0.761	0.335	-0.032
4	0.185	-0.395	-0.174	0.277	-0.317	0.776
5	-0.371	-0.097	0.275	-0.452	0.573	0.496
6	0.373	0.042	-0.754	-0.086	0.532	0.012

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization

Reliability Statistics

Internal consistency was assessed using Cronbach's alpha for each identified factor:
Factor 1: α = .887 (10 items)
Factor 2: α = .822 (7 items)
Factor 3: α = .841 (7 items)
Factor 4: α = .794 (5 items)
Factor 5: α = .624 (3 items)
Factor 6: α = .452 (3 items)

According to Nunnally and Bernstein (1994), values above .70 indicate good internal consistency; therefore, Factors 1 through 4 achieved adequate reliability. Factor 5 showed moderate consistency, which is considered acceptable in exploratory studies (Hair et al., 2019), whereas Factor 6 exhibited a low level of reliability, suggesting that its items should be reviewed in future research.

DISCUSSION

The results obtained indicate that the factorial model applied to the variables of organizational commitment, internal marketing, and work climate enabled the identification of six components that significantly explain the underlying structure of the data. The KMO index (= .814) and Bartlett's sphericity test ($p < .001$) confirmed the adequacy of the analysis, while reliability values, mostly above 0.70, support the internal consistency of the factors, with the exception of the last two components, which showed low reliability levels. These findings suggest that, although there is a solid basis for explaining the relationships among the variables, some factors require further theoretical and methodological refinement.

The presence of robust components related to internal marketing aligns with recent research highlighting its strategic role in consolidating strong organizational cultures and enhancing employee satisfaction (Sihombing, 2007). Internal marketing not only strengthens internal communication but also contributes to talent retention and the alignment between individual and organizational objectives, as reflected in the high Cronbach's alpha values obtained for the associated factors.

Similarly, organizational commitment emerged as a significant factor, corroborating studies that indicate its direct influence on motivation, performance, and the reduction of employee turnover (Rodríguez, 2024). The results show that the items associated with this dimension clustered consistently, reinforcing the notion that commitment constitutes a core element for understanding the internal dynamics of contemporary organizations.

Regarding the work climate, the findings reveal the presence of differentiated factors that explain employees' perceptions of the work environment. Recent research indicates that a positive climate is associated with higher levels of innovation, collaboration, and employee well-being (Liu and Sun, 2025). However, the moderate reliability of some factors suggests the need to review the items used and to explore additional dimensions that may more accurately capture the complexities of the organizational climate.

It is important to note that the last two components exhibited relatively low reliability values ($\alpha = .624$ and $\alpha = .452$), which could be attributed to the heterogeneity of the items or to a lack of conceptual cohesion among them. This finding aligns with previous methodological recommendations emphasizing the need to assess construct validity and the relevance of each item within the factorial structure (Hair et al., 2022). Nonetheless, the identification of these components opens new avenues for exploration in future studies, which could further investigate emerging dimensions of internal marketing or work climate that remain underexplored.

Limitations

Factor 6 exhibited low internal consistency, suggesting the need to add or reformulate items, and possibly increase their number to better capture this dimension.

The study employed a cross-sectional and correlational design, which does not allow for causal inferences. The convenience sample, drawn from a single university, limits the generalizability of the results to other higher education institutions or regions of the country.

Practical Implications

Universities should focus on enhancing Internal Communication and Support, Training, Affective Commitment, and Interpersonal Relationships, as these factors emerged with good reliability and have the potential to generate significant improvements in institutional commitment.

The six factors can be used in institutional assessments to identify specific weaknesses, rather than assuming that the original theoretical variables fully capture organizational reality.

CONCLUSIONS

The factorial analysis allowed the identification of six components that significantly explain the structure of the variables internal marketing, organizational commitment, and work climate, with adequate measures of sampling adequacy (KMO = .814) and a significant Bartlett's test ($p < .001$), as well as satisfactory reliability levels for most factors, except for two that require conceptual and methodological review. The findings highlight that internal marketing strengthens employee satisfaction and alignment, organizational commitment is key to retention and performance, and work climate influences innovation, collaboration, and employee well-being. The main contribution lies in demonstrating the validity and consistency of the scales applied within a specific organizational context, although limitations related to the low reliability of two factors and the cultural restriction of the study suggest the need for future replications using confirmatory models. Overall, the study reaffirms the relevance of

these variables for human talent management and provides a foundation for designing practical strategies to foster more committed, cohesive, and performance-oriented work cultures in competitive environments.

Conflict of Interest

The authors declare no conflict of interest.

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