Organizational Learning, Its Antecedents and Consequences From the Perspective of Teachers From Public Higher Education Institutions

Jandeson Dantas da Silva[1], Wenyka Preston Leite Batista da Costa[1], Lais da Silva Barreto[2], Walid Abbas El-Aouar[2], Antônio Claudio Noberto Paiva[1] & Sergio Luiz Pedrosa da Silva[1]

[1] Universidade do Estado do Rio Grande do Norte, Brazil

[2] Universidade Potiguar, Brazil

Correspondence: Jandeson Dantas Silva, Universidade do Estado do Rio Grande do Norte, Brazil.

Abstract

The general objective of this article is to measure and analyze the correlations that involve organizational learning, its antecedents, and consequences from the performance perspective, based on the perception of professors from public higher education institutions. In terms of objectives, the research method is classified as descriptive. As for the procedures, a survey was carried out, and the approach to the problem is quantitative. Data collection was carried out through a structured questionnaire. The research was based on the perception of 600 professors. The results highlight that the constructs of knowledge acquisition and transformation, organizational learning culture, and affective organizational commitment are significant and positive antecedents that influence learning at an organizational level. Additionally, the correlation between organizational learning and performance is significant and positive. We emphasize the elaboration of the proposed integrated model that considered the significant and positive correlations between organizational learning culture and team cohesion; team cohesion and affective organizational commitment; team cohesion and knowledge acquisition and transformation; and knowledge acquisition and transformation and organizational learning culture; organizational learning culture and affective organizational commitment; knowledge acquisition and transformation and affective organizational commitment. We concluded that the validation of the proposed integrated model is a contribution of research to science and social and administrative practice. However, the research substantiates aspects of the antecedents and consequences of organizational learning with contributions to managers and meets academic and social aspirations. Other variables could be tested, and other groups of respondents could be investigated.

Keywords: organizational learning, antecedents, consequences, performance, structural equation modeling

1. Introduction

Organizations seek strategies that generate competitive advantage. One of these possibilities is through organizational learning and its antecedents from the performance improvement perspective.

Therefore, organizational learning can contribute to institutional performance. The need for organizational learning in the public sector is high and depends on political involvement and specific characteristics of that involvement (Dekker and Hansén, 2004). From this perspective, Ferreira and Medeiros (2011) emphasize that, in the public sector, organizational learning is seen as a strategic resource capable of making processes efficient and effective.

Among the different organizational contexts of the public sector, the academic environment formed by Higher Education Institutions (HEIs) stands out, emphasizing learning as a central strategy, enabling society development through teaching, research, and extension activities (Abenga, 2018).

Among the 2,608 existing Higher Education Institutions in Brazil, only 302 are public. However, they are responsible for a total of 2,080,418 enrollments. Regarding the number of professors, public HEIs have 176,043 professors. These institutions are characterized by developing teaching, research, and extension activities with a high national and international impact. Therefore, Brazilian public Higher Education Institutions are recognized by the QS World University Ranking as a result of providing quality service.

Al-Qahtani and Ghoneim (2013) highlight the high number of obstacles present to the application of organizational learning in universities, limiting the application of the practices of the learning process.

Dee and Leisyte (2016) expose the field of higher education as a research gap. To the authors, this field lacks research on organizational learning in the context of universities, highlighting the predecessor mechanisms that foster learning as a research agenda.

Lauer and Wilkesmann (2017) state that governance based on organizational learning in universities enables several benefits, such as a reduction in the dropout rate, emphasizing the need for studies that develop learning management models focused on the university. Elliott and Goh (2013) guide the expansion of studies that build organizational learning instruments for public universities, aiming at organizational effectiveness.

Although political competition increases organizational learning, other factors such as network, administrative and management characteristics, and political participation influence learning outcomes (Askim, Johnsen, and Christophersen, 2007).

To Jang (2010), there are gaps to be filled, which consist of identifying the antecedents and consequences of organizational learning in the public sector. In this sense, Barette *et al.* (2012) state that it is necessary to identify and understand how the predecessors of learning work and the reflexes they produce from the perspective of generating performance in the public sector.

Among the learning facilitators highlighted by Barette *et al.* (2012) is knowledge acquisition and transformation, which consists of a set of variables that combine elements of the five stages of organizational learning and are related to the sharing, interpretation, and discussion of information.

Another factor that makes learning possible is the organizational learning culture. It represents a set of collective structures that employees use to interpret their world's nature and relationship with it. It aims to facilitate the development of a workspace favorable to exploration, experimentation, constructive feedback, open communication, and tolerance of diversity, as well as encouraging mutual help and sharing of ideas, enabling employees to go beyond their responsibilities (Barette *et al*., 2012).

Team cohesion is another potential antecedent of organizational learning, and it involves variables that encourage the attraction of employees to a group, as well as the incentives given for them to remain part of it (Wendt, Euwema, and Emmerik, 2009).

Organizational commitment is a form of affective attachment to objectives, values, and to the organization, thus referring to an employee's identification, involvement, and interest in the organization (Meyer and Allen, 1991).

Regarding the consequences of organizational learning, this research focuses on performance. It is based on the gap exposed by Dee and Leisyte (2016), in which studies involving higher education institutions and organizational learning can explore the development that promotes the improvement of institutional performance.

Thus, the research problem emerges: what is the correlation between organizational learning, its antecedents and consequences from the perspective of professors from public higher education institutions? Thus, the research is developed to analyze the correlations that involve organizational learning, its antecedents and consequences.

From the research problem, the following hypotheses are assumed: H1 – Knowledge acquisition and transformation is positively related to organizational learning; H2 – Organizational learning culture is positively related to organizational learning; H3 – Team cohesion is positively related to organizational learning; H4 – Affective organizational commitment is positively related to organizational learning; H5 – Organizational learning is positively related to performance.

2. Theoretical Framework

Organizational learning is a strategic element in granting competitive advantage to institutions. Thus, identifying and understanding the behavior of organizational learning facilitators in the public sector constitutes an advantage tool (Barette *et al*., 2012).

In the public sector, learning is the process in which the related parties develop a more comprehensive and accurate, multidisciplinary understanding, which underpins their decision-making. Thus, this development is relevant in formulating policies since, once we understand the individual and collective factors that influence learning, it is possible to design decision-making that facilitates learning and produces better public policies, their implementation, and their results (Leach *et al*., 2014).

According to Jyothibabu, Farooq, and Pradhan (2010), organizational learning corresponds to the search for the improvement of knowledge, skills, and actions in order to meet the institutional vision, mission, and objectives.

This time, the construct concerning knowledge acquisition and transformation addresses the five phases of organizational learning: acquisition of new knowledge and information; sharing, interpreting, and discussing this information among employees; reflecting on evaluating decisions and results; and storing and extracting information from organizational memory (Barette *et al.*, 2012).

From the perception of Lopez, Peon, and Ordas (2005), knowledge acquisition and transformation is a construct capable of positively influencing organizational learning, enabling the generation of advantage.

In this sense, the following hypothesis was developed:

H1 – Knowledge acquisition and transformation is positively related to learning at an organizational level in the context of public higher education institutions.

The organizational learning culture consists of significant structures transmitted to the organization's employees to interpret their environment. It is associated with the implicit storage of information, which influences how new knowledge is acquired and processed. In this way, the culture incorporates past experiences that may be useful in the future (Walsh and Ungson, 1991).

According to Mantiri (2013), culture encompasses several factors that affect teaching and learning. Corroborating this, the construct developed by Barette *et al*. (2012) presents variables that seek to understand the willingness to change and innovation, whether there are incentives to share information, how to perceive changes, and the search to identify whether there are incentives for experiences.

In the conception of Wiewiora, Smidt, and Chang (2019), culture works as a bridge to learning. Thus, culture is likely to influence learning development the more ambiguous the data or technologies are (Mahler, 1997). Therefore, in the perception of Tsang (1997), organizational learning can be classified, among others, in a cultural aspect.

In this way, the organizational learning culture is a strategic resource for expanding the application of organizational learning in higher education institutions (Al-Qahtani and Ghoneim, 2013), enabling reflections on institutional performance and, consequently, competitive advantages.

In this context, considering that the organizational learning culture element influences learning, the following hypothesis was developed:

H2 – Learning culture is positively related to organizational learning.

According to Barette *et al.* (2012), teams can use resources to create organizational adaptations. Therefore, team cohesion is essential for achieving previously established objectives and goals.

In addition, Siciliano (2016) states that, when seeking tacit information, employees trust those with whom they feel more comfortable and are more accessible, to the detriment of specialists.

In this sense, we can highlight that people learn from their direct experiences, as well as from the experiences of other team members, through feedback, explanation, help, or advice. This knowledge exchange brings together the sources of knowledge and leads them to new structures (Woerkom and Sanders, 2010).

Wendt, Euwema, and Emmerik (2009) expect employees to show more cohesive behavior in completing tasks and improving interpersonal relationships from the perspective of the learning process. Therefore, the capacity for collective learning can play a key role in solving social problems (Gerlak and Heikkila, 2011).

Therefore, the team cohesion construct exposes variables that seek to understand if people trust their work groups if they treat each other with respect and are friendly, and if they cooperate, work as a team, and are willing to share resources. Finally, we seek to understand if they are proud to belong to the institution.

Considering that team cohesion potentially and directly influences organizational learning, the following hypothesis is presented:

H3 – Team cohesion is positively related to organizational learning.

According to Cançado, Moraes, and Silva (2006), affective organizational commitment is recognized as an essential construct for the development of organizational learning, as it establishes the link between the individual and the organization, capable of influencing organizational performance.

According to Santos (2009), the greater the affective commitment, the greater the perception that employees have of the organizational learning potential in the institution. Therefore, commitment constitutes a psychological state necessary for organizational learning (Lipshitz, Popper, and Friedman, 2002).

That said, the construct developed by Allen and Meyer (1990) addresses variables that are related to the individual's perception of the organization, such as whether the institution deserves their loyalty, whether they feel the organization's problems as if they were their own, the meaning of the entity for the employee, and the state of belonging to the work environment.

Thus, the following hypothesis is proposed.

H4 – Organizational learning is positively related to affective organizational commitment.

Public institutions need performance evaluation models to contribute to development. Among the performance evaluation metrics that can be used are productivity, profitability, market share and customer satisfaction, financial, students' learning performance, research, innovation development, and community service (Yudianto *et al*., 2021).

Performance can be optimized through learning. In this sense, Dee and Leisyte (2016) show that studies involving higher education institutions and organizational learning can explore development that promotes improving institutional performance.

Still, concerning the performance of public institutions, Pedler and Hsu (2019) emphasize that the strategy based on organizational learning focuses on optimizing work and social benefits, enabling improved resource management, and generating effectiveness in providing services to society.

The variables addressed in the performance construct refer to institutional prestige before society, aspects related to productivity, the ability to influence other research, and the potential to attract international talent and contribute to innovations and inventions (World University Ranking, 2021).

Thus, hypothesis five emerges:

H5 – Organizational learning is positively related to performance.

In order to analyze the correlation between the antecedents of learning and organizational learning from a performance perspective, the initial theoretical framework was developed (Figure 01).
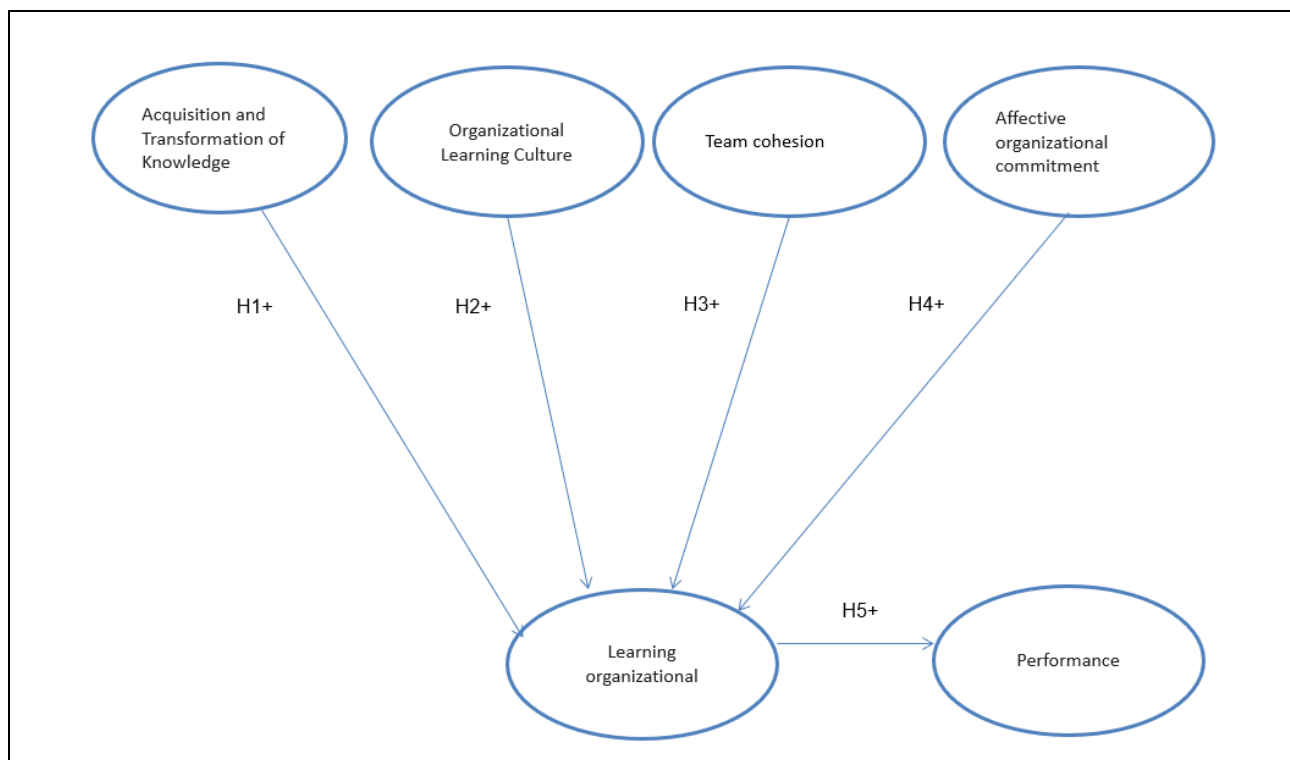

Figure 1. Initial Theoretical Framework

The framework is used to assess whether the constructs are related to organizational learning and, in turn, to performance.

3. Methodology

The parameters defined by Raupp and Beuren (2003) were used to define the research typology. Thus, the research was framed regarding objectives, procedures, and approaches to the problem.

As for the objectives, the research is classified as descriptive, as it consists of accurately describing the phenomena of a certain reality of the population; in this case, professors of public higher education institutions in Brazil, using a set of categories or varied types of classifications, relating the research variables without interference from the researcher (Raupp and Beuren, 2003).

Regarding the technical procedures, the survey was used. This research typology is used with an emphasis on exploratory and descriptive research that aims to directly interrogate a group of people through a closed questionnaire as a research instrument (Raupp and Beuren, 2003).

Regarding the approach to the problem, the study was interpreted through a quantitative approach, which makes it possible to measure certain characteristics of a significant sample of the population to explain the object of the research (Guimarães, 2013).

In this sense, the population of this research is composed of professors from public higher education institutions, which, in the Brazilian scenario, comprise 176,043 professors (Brasil, 2020). However, to concentrate the research, professors from the 12 best public universities recognized in the QS World University Ranking (QS) – Topuniversities, 2022, Latin America, Brazil, were defined as the initial sample.

After defining the sample, a pilot survey was conducted with 59 respondents, masters and doctors with different training in Social Sciences. This area of knowledge was chosen to contribute to understanding society's functioning, cultural diversity, and people's behavior. Subsequently, data from the pilot survey were not included in the total sample.

Thus, 33,395 emails were sent with the questionnaire, and the electronic addresses were collected through the institutions' websites, which resulted in the return of 695 respondents that form the final sample of the research and contemplate the parameters defined by Hair Jr. *et al.* (2014), that is, at least 10 respondents for each observable variable or at least 200 respondents (Kline, 2015).

The collection stage took place between April 20th and September 20th, 2021, and was applied via email using Google Forms[TM] based on a closed questionnaire structured in 30 variables related to organizational learning, its background and performance, and four questions about the respondent's profile.

Thus, a reduction and adaptation of the research instrument was carried out, which brings the perspective of authors such as Barette *et al.* (2012); Jyothibabu, Farooq, and Pradhan (2010); Allen and Meyer (1990); and Wendt, Euwema, and Emmerik (2009). Subsequently, the validation was carried out by observing the context of the universities. The validation of the instrument comprises the elaboration of the questions and the consolidation with the accomplishment of pre-tests.

Then, the 5-point scale was used to name the responses, ranging from Strongly disagree (1); Partly disagree (2); Neither disagree nor agree (3); Partly agree (4); to Totally agree (5), to be chosen by the respondents according to the intensity in which the content of the alternative occurs in the institution.

We should mention that three experts, professors, and researchers in management and business validated the data collection instrument. The choice was made because the research areas of the specialists were concomitant with the theme of the present study (Table 1).

Table 1. Observable and latent variables

Knowledge Acquisition and Transformation
(KAT) – Barette *et al.* (2012)
KAT1 - Horizontal organizational chart structures (where larger groups of employees report directly to just one manager) encourage the sharing of learning across all sectors of the institution.
KAT2 - New ideas are quickly disseminated throughout the institution.
KAT3 - Systems exist to distribute information in an accessible and easy-to-understand format.
KAT4 - Work practices are shared among employees.

KAT5 - There is a normal process of evaluating objectives, activities, methods, and resources.

Organizational Learning Culture (OLC) – Barette *et al*. (2012)

OLC1 - There is openness to change and innovation.

OLC2 - There is an incentive for sharing and mutual assistance (sharing information and ideas).

OLC3 - Formal rules can be questioned as to their usefulness and value.

OLC4 - Changes are perceived as opportunities and not threats.

OLC5 - Experimental attitudes are encouraged.

Team Cohesion (TC) – Wendt, Euwema, and Emmerik (2009)

TC1 - People in my work group trust each other.

TC2 - People are warm and friendly and treat each other with respect.

TC3 - People work well together as a team and cooperate with each other.

TC4 - People are willing to share resources.

TC5 - People are proud to belong to the educational institution.

Affective Organizational Commitment (AOC) – Allen and Meyer (1990)

AOC1 - People feel the organization's problems as if they were their own.

AOC2 - The organization has an immense personal meaning for me.

AOC3 - This organization deserves my loyalty.

AOC4 - Staying in the organization is a desire as much as a need.

AOC5 - I would be very happy to dedicate the rest of my career to the institution.

Learning at the Organizational Level (LOL) – Jyothibabu, Farooq, and Pradhan (2010).

LOL1 - The institution has a clear vision, mission, and strategy for the future.

LOL2 - The organizational structure allows people to work effectively.

LOL3 - The institution has developed operational procedures (e.g., step-by-step/procedure manual) and/or systems to encourage knowledge management.

LOL4 - The organization assesses the impact of each function or activity.

LOL5 - The team's skills are developed according to the institution's objectives.

Performance (PER) – Adapted from QS World University Ranking (QS) – TopUniversities (2021).

PER1 - The institution has high academic prestige in society (learning and teaching environment/academic reputation).

PER2 - The institution has good research productivity, indexed in international databases (volume and reputation).

PER3 - The institution can influence other research through its publications (research influence).

PER4 - The institution can attract international staff, students, and co-authors globally (from an international perspective).

PER5 - The institution can contribute to other organizations with innovations, inventions, and consultancy (knowledge transfer).

The Statistical Package for Social Sciences (SPSS®) software, version 21 for Windows®, was used to analyze the collected data. As for the structural equation modeling, we used the AMOS® software, version 21, coupled with SPSS®. According to Byrne (2010), this software presents the essential functions for the exam that the modeling demands.

Regarding data processing, we seek to use descriptive statistics and Structural Equation Modeling (SEM) techniques because they are appropriate when there is some implicit knowledge, whether theoretical or empirical, of the structure of potential variables (Byrne, 2010).

Scores are observed to identify and exclude outliers that demonstrate inconsistencies with the rest of the data. Thus, we seek to exclude extreme scores with an analysis of univariate and multivariate outliers using the Z score calculation for the univariate with values higher than 3 for each variable. To identify the multivariate outliers, the Mahalanobis calculation was applied, seeking to identify cases with a large distance between the individual value and the sample means. In the perception of Kline (2015), through these analyses, it is possible to identify extreme scores in more than one variable or if the configuration of scores is unusual.

4. Results and Discussions

Upon using the research form, it was possible to identify the profile of the respondents, considering the following aspects: gender, age, education level, and time in the institution.

Thus, we identified that 307 are women, 289 are men, and only 4 preferred not to inform. Concerning the age group, 322 respondents are 50 years old or older. This data demonstrates the maturity of the public surveyed. It is possible to infer that 581 have a doctorate, 18 are masters, and 1 has a degree. Regarding the time working in the institution, we found that 194 respondents have been there for over 20 years.

Therefore, the predominant profile of the respondents consists of professors with more than 20 years of experience, with a *stricto sensu* postgraduate degree at the doctoral level, female, and over 51 years old.

In order to confirm the theoretical model, the exploratory factor analysis (EFA) was performed.

In order to demonstrate the internal consistency and reliability of all factors and constructs together, an analysis of Cronbach's alpha was performed, which presented a result of 0.919, well above the lower limit ≥ 0.7 (Ladeira Júnior, Sonza, and Berte, 2012). The Bartlett's sphericity test was significant (≤ 0.05), and the KMO showed 0.911, above 0.5, a fact that attests to the general consistency of the data, as shown in Table 2.

Table 2. Cronbach's alpha, Bartlett, and KMO results

Test		Values found
Cronbach's alpha		0.919
Kaiser-Meyer-Olkin measure (KMO)		0.911
	approx. chi-square	8335.051
Bartlett's sphericity test	gl	351
	Sig.	0.000*

*≤ 0.05 (HAIR JR. *et al*., 2014).

The commonalities were then analyzed, and the factors explained an indicator of the proportion of the variability of each variable. In this sense, we identified that only one variable had a value lower than 0.5, AOC1 (0.382), so it was excluded. The other variables had acceptable values (≥ 0.5).

From Table 3, we can see that the observable variables have low variability, with a standard deviation around 1 or below and averages above 3, so the respondents agree with the statements. The results favor the acceptance that the researched constructs exist and are recognized.

We should mention that the values found for Cronbach's alpha are above 0.7, acceptable for data analysis (Hair Jr. *et al*., 2014).

Table 3. Factor structure

Factor/ latent variable	Average	Standard deviation	Alpha	Variable observable	Communalities	Loads
KAT	3.05	1.09	0.743	KAT2	0.636	0.735
				KAT3	0.611	0.728
				KAT4	0.582	0.640
				KAT5	0.548	0.526
OLC	3.26	1.06	0.836	OLC1	0.663	0.665
				OLC2	0.645	0.441
				OLC3	0.539	0.690
				OLC4	0.680	0.736
				OLC5	0.671	0.707
TC	3.38	1.03	0.883	EC1	0.721	0.806
				EC2	0.750	0.816
				EC3	0.802	0.842
				EC4	0.687	0.784
AOC	4.39	0.84	0.869	AOC2	0.660	0.776
				AOC3	0.727	0.810
				AOC4	0.757	0.835
				AOC5	0.744	0.805
LOL	3.35	1.01	0.841	LOL1	0.597	0.620
				LOL2	0.612	0.652
				LOL3	0.627	0.721
				LOL4	0.687	0.746
				LOL5	0.662	0.684
PER	4.58	0.59	0.851	PER1	0.569	0.733
				PER2	0.733	0.839
				PER3	0.734	0.844
				PER4	0.568	0.717
				PER5	0.641	0.766

By observing the validation process of the observable variables, the composite reliability tests were performed, and the calculation of the Average Variance Extracted. Values above 0.5 and 0.7, respectively, are expected (Hair Jr. *et al.*, 2014).

In the composite reliability test, all the analyzed variables presented a result of 0.982, indicating an internal consistency of the construct indicators, as it is responsible for measuring the degree to which they indicate the mutual latent construct. As for the Average Variance Extracted, this indicator explains the total variance of each observable variable used to evaluate the construct. The result of the constructs, together, presented satisfactorily at 0.7.

The individual analysis of the composite reliability showed that all the tested constructs presented adequate composite reliability, according to the values prescribed by Hair Jr. *et al.* (2014) (≥ 0.5) and by Severo, Guimarães, and Dorion (2018) (≥ 0.7). By analyzing the constructs individually, they presented the composite reliability of i) Knowledge Acquisition and Transformation, 0.828; ii) Organizational Learning Culture, 0.898; iii) Team Cohesion, 0.933; iv) Affective Organizational Commitment, 0.922; v) Organizational Learning, 0.901; and vi) Performance, 0.916. From these indices, it is considered that the observable variables are consistent in their measurements.

Regarding the analysis of Convergent Validity and Discriminant Validity, observing each construct, we can see that the convergent validity exceeds the recommended ($\geq$ 0.7) for the following constructs: Performance, Affective Organizational Commitment, and Team Cohesion, whereas for the constructs concerning Organizational Learning, Organizational Learning Culture, Knowledge Acquisition and Transformation, the results were below expected, but very close to the desired, which means that these constructs need to be complemented and matured in the literature; so the construct is not so strong, as per Table 4.

Table 4. Convergent and discriminant validity

	PER	LOL	AOC	TC	OLC	KAT
PER	0,70[a]					
LOL	0,37[b]	0,65[a]				
AOC	0,37[b]	0,46[b]	0,75[a]			
TC	0,25[b]	0,50[b]	0,36[b]	0,78[a]		
OLC	0,25[b]	0,75[b]	0,38[b]	0,59[b]	0,64[a]	
KAT	0,27[b]	0,79[b]	0,35[b]	0,49[b]	0,79[b]	0,55[a]

[a]Average Variance Extracted.

[b]Shared Variance.

Considering that the shared variance was not $\geq$ 0.8 in any of the cases, the results were accepted, considering the existing potential correlation.

Thus, fifteen modifications were made to the initial model in which they were cumulatively tested, according to the following correlations between the constructs: Knowledge Acquisition and Transformation and Affective Organizational Commitment, Knowledge Acquisition and Transformation and Team Cohesion, Knowledge Acquisition and Transformation and Organizational Learning Culture, Organizational Learning Culture and Team Cohesion, Organizational Learning Culture and Affective Organizational Commitment, Organizational Learning Culture and Affective Organizational Commitment. Additionally, correlations between observable variables were tested based on Pearson's Correlation Matrix ($\geq$ 0.7), which are: KAT2 and KAT3, OLC3 and OLC4, OLC4 and OLC5, EC1 and EC2, AOC4 and AOC5, LOL1 and LOL2, LOL3 and LOL4, LOL4 and LOL5, PER1 and PER2, and PER4 and PER5.

To test the final model, the same factor structure of the initial model found in the literature was used. Therefore, considering the theoretical construction, the correlations suggested in the fit of the model, and the correlations identified through the Pearson Correlation Matrix ($\geq$ 0.7), the experiment of creating models was carried out in order to identify the best fit to the data analysis, obtaining the proposed final model, as shown in Figure 2.
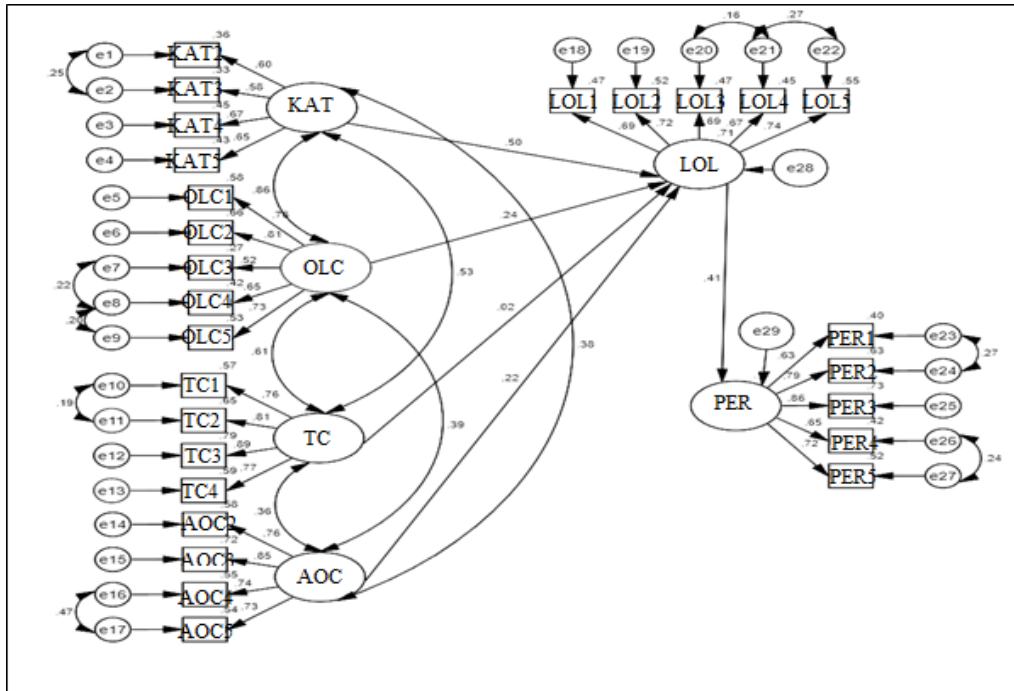
Figure 2. Proposed integrated model

The results of the proposed integrated model made it possible to compare the fit and quality indices between the initial and the proposed final models, as shown in Table 5.

Table 5. Adjustment indices

Index	Theoretic model	Suggested model
Chi-square	1525,810	696,333
Degrees of freedom	319	304
Chi-square divided by Degrees of Freedom	4,783	2,291
Significance Level	0.000	0.000
GFI – Goodness of Fit Index	0.839	0.921
AGFI – Adjusted Goodness of Fit	0.809	0.902
CFI – Comparative Fit Index	0.851	0.952
NFI – Normed Fit Index	0.820	0.918
RMSEA – Root Mean Squared Error of Approximation	0.079	0.046
RMR – Root Mean Square Residual	0.196	0.041
ECVI – Expected Cross-Validation Index	2,744	1,410
Cronbach's alpha	0.919	
KMO – Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.911	
Average Variance Extracted (AVE)	0.700	
Composite Reliability (CC)	0.982	

* Significance level $p < 0.001$

The chi-square (x ⅔/degrees of freedom measure of absolute fit showed a good fit, as it obtained a result $\leq$ 5 (2.291), so the estimated covariance matrix was close to the real model verified.

The GFI fit index, which presented 0.839, began to indicate a perfect fit of 0.921 ($\geq$ 0.9). As for the AGFI parsimony adjustment, it changed from 0.809 to 0.902, demonstrating an improvement in the index and reaching adequacy. Regarding the incremental adjustment indices, the NFI was analyzed, which presented a value of 0.820 in the initial model, very close to recommended. However, in the final model, the adjustments were useful to adapt the model, obtaining a value of 0.918. As for the CFI, it presented a value of 0.851 in the initial model. After adjusting the model, it was found to have a value of 0.952, meeting the reference values recommended by Ladeira Junior, Sonza, and Berte (2012).

The RMSEA changed from 0.079 to demonstrate a better fit of 0.046, considering the maximum of 0.08 as expressed by Hair Jr. *et al*. (2014).

Comparing the two models using the RMR, the initial model (0.196) and the final model proposed (0.041), and considering that the lower the value, the better the adjustment of the model, it appears that the final proposed model presents better adequacy. In order to measure the best quality, if another sample of the same size is used next to the model through ECVI, we concluded that there was a decrease between the initial value (2.744) and that of the final model (1.410), demonstrating that the proposed integrated model finds it more adequate concerning the indicators compared to the initial theoretical model, according to the teachings of Hair Jr. *et al*. (2014).

Thus, considering the analysis of the proposed final model through the fit and quality indices tested (GFI, NFI, CFI, AGFI, RMSEA, RMR, and ECVI) and based on the indicators of validity and reliability of the variables (Cronbach's alpha, KMO, Barttlet's sphericity, Average Variance Extracted, Composite Reliability, Convergent and Discriminant Validity), it is inferred that the relationships and correlations presented in the proposed integrated model were adequate for the research.

As for the hypothesis tests, the standardized estimates and the significance of the proposed final model are presented. The results show a positive correlation of confirmation of the H1 hypothesis between the following constructs: Organizational Learning, Knowledge Acquisition and Transformation (KAT $\rightarrow$ LOL). The results show that Knowledge Acquisition and Transformation has a moderate correlation with Learning at the Organizational Level (H1 – standardized estimate of 0.500 and a significant p-value of 0.000). Such findings demonstrate that the development of learning at the organizational level of public HEIs in Brazil, from the teachers' perception, is related to the acquisition phases of new knowledge, such as sharing, interpretation, discussion, reflection, storage, and extraction of information from organizational memory.

The cognitive approach of learning theory appears to contribute to understanding this correlation by paying attention to understanding, transforming, storing, and using the information involved in cognition (Roper and Davis, 2000).

The result of this correlation corroborates the behaviorist approach of learning theory which, in turn, argues that the individual learns from his environment, making it possible to predict and control behavior (Skinner, 1959).

Finally, the results show that Knowledge Acquisition and Transformation influences Learning at an Organizational Level, corroborating Barette *et al*. (2012) and Lopez, Peon, and Ordas (2005), when relating, in their models, knowledge acquisition and transformation through learning.

The second hypothesis, which involves the correlation between organizational learning and organizational learning culture (OLC $\rightarrow$ LOL), despite being considered significant, presents a p-value of 0.044. Its standardized estimate of 0.243 demonstrates the existence of a weak correlation. However, we concluded that organizational learning culture influences learning at the organizational level.

This finding complies with the proposition of Tsang (1997) that organizational learning can be classified, among others, in a cultural aspect. Considering that culture incorporates past experiences capable of being useful in the future (Walsh and Ungson, 1991) and that it has factors that affect the teaching and learning process (Mantiri, 2013), the research findings consist of informing the (positive) meaning and (weak) the intensity of this correlation involving professors in public institutions of higher education in Brazil. This result also corroborates with Wiewiora, Smidt, and Chang (2019) when they expose that the mechanism that involves culture works as a bridge to learning.

This correlation confirms what was proposed by the sociocultural approach of learning theory that analyzes development as a result of social interactions (Kirylo and Boyd, 2017) when determining that learning culture influences organizational learning.

Dealing with the correlation that involves team cohesion and organizational learning (H3), it is possible to identify, in the survey results, that there is a positive, weak correlation with no statistical significance (standardized estimate of 0.019 and non-significant p-value 0.689). Therefore, team cohesion does not influence learning at an organizational level from the perspective of professors in the context of Brazilian higher education institutions. Thus, it is not possible to confirm hypothesis three (H3), contrary to the literary assumptions of Barette *et al*. (2012), Wendt, Euwema, Emmerik (2009), and Woerkom, Sanders (2010).

The fourth hypothesis (H4) relates affective organizational commitment and learning at the organizational level (AOC → LOL). The results demonstrate a significant, positive, but weak correlation (standardized estimate of 0.219 and significant p-value of 0.000). Thus, it is possible to affirm that affective organizational commitment positively influences learning at an organizational level, confirming hypothesis H4 and corroborating with Lipshitz, Popper, and Friedman (2002), who state that affective organizational commitment is necessary for organizational learning, and Santos (2009), who defends that, the greater the affective commitment, the greater the perception of employees regarding the potential for organizational learning. The findings also confirm the assumptions of Cançado, Moraes, and Silva (2006) regarding the correlation between the constructs.

This correlation addresses the humanistic approach of learning theory, as it studies man as the holder of freedom of choice, suffering social and physiological influences, so his development is integrated into the environment in its affective, cognitive, and motor aspects (Taormina and Gao, 2013).

Additionally, this result is in line with the perception of Tsang (1997), in which organizational learning can be classified, among other groups, into cognitive and behavioral.

In the cognitive view, learning is an active process in which individuals construct ideas based on their knowledge, values, beliefs, and motivations (Roper and Davis, 2000). It is possible to identify an aspect of the behaviorist approach in which the individual learns from his environment (Skinner, 1959).

The contribution of this research to the academic and professional scope is to demonstrate the (positive) meaning of this correlation; that is, while it increases affective organizational commitment, it increases learning at the organizational level. In addition, it demonstrates its (weak) intensity, applying empirical study among public higher education teachers in Brazil.

Finally, the correlation between performance and learning at the organizational level (LOL → PER) is significant, positive, and of moderate intensity (standardized estimate of 0.409 and significant p-value of 0.000). The findings show that the fifth hypothesis (H5) was confirmed. Thus, organizational-level learning influences performance positively, which corroborates Vera and Crossan (2004), who expose that learning contributes to the construction of organizational performance.

Ferreira and Medeiros (2011) corroborate by exposing that organizational learning makes it possible to carry out actions efficiently and effectively, consequently improving performance, as well as Lauer and Wilkesmann (2017). They emphasize that adopting organizational learning in universities can generate a competitive advantage. The result also corroborates Vygotsky's contribution in considering that learning influences development and not the opposite, as explained by Duarte (1996).

This research contributes academically and professionally when it exposes the (positive) meaning, the statistical significance, and, mainly, the identification of the (moderate) intensity of the correlation between learning at an organizational level and performance from the perception of professors from public institutions of higher education in Brazil.

Table 6. Hypothesis test of the proposed integrated model

Constructs	Standardized Estimates	p-value
LOL ← KAT	0,500	0,000*
LOL ← OLC	0,243	0.044*
LOL ← TC	0,019	0,689
LOL ← AOC	0,219	0,000*
PER ← LOL	0,409	0,000*
KAT ↔ OLC	0,856	0,000*

OLC ↔ TC	0,606	0,000*
TC ↔ AOC	0,355	0,000*
OLC ↔ AOC	0,393	0,000*
KAT ↔ TC	0.527	0.000*
KAT ↔ AOC	0.383	0.000*

* Significance level p≤0.05.

Considering the use of the criterion where the p-value needs to be less than 0.05 to confirm the hypothesis, the correlation between organizational learning and team cohesion (EC → LOL) was not confirmed as it had a p-value of 0.689, higher than the determined parameter.

Notably, no correlation was rejected by the criterion of existence of estimates in the opposite direction to the literature, that is, negative.

Table 7 shows the results of the hypotheses considering the final proposed model.

Table 7. Testing the hypotheses of the proposed integrated model

No.	Hypotheses	Representation	Result
H1	Knowledge acquisition and transformation is positively related to organizational learning	KAT → LOL	Confirmed
H2	Organizational learning culture is positively related to organizational learning	OLC → LOL	Confirmed
H3	Team cohesion is positively related to organizational learning	TC → LOL	Not Confirmed
H4	Affective organizational commitment is positively related to organizational learning	AOC → LOL	Confirmed
H5	Organizational learning is positively related to performance	LOL → PER	Confirmed

It was evidenced that there is a positive and significant correlation between the following constructs: Knowledge Acquisition and Transformation with Organizational Learning Culture (KAT ↔ OLC, estimate 0.856, p-value 0.000), as well as Organizational Learning Culture and Team Cohesion (OLC ↔ TC, estimate 0.606, p-value 0.000), Team Cohesion with Affective Organizational Commitment (TC ↔ AOC, estimate 0.355, p-value 0.000), Organizational Learning Culture and Affective Organizational Commitment (OLC ↔ AOC, estimate 0.393, p-value 0.000), Knowledge Acquisition and Transformation and Team Cohesion (KAT ↔ TC, estimate 0.527, p-value 0.000), Knowledge Acquisition and Transformation and Affective Organizational Commitment (KAT ↔ AOC, estimate 0.383, p-value 0.000).

We should point to the high-intensity correlations: Knowledge Acquisition and Transformation and Organizational Learning Culture (estimate 0.856) and Organizational Learning Culture and Team Cohesion (estimate 0.606). The other correlations are moderate, as they obtained values between 0.3 and 0.5.

As for the correlations between KAT2 and KAT3, OLC3 and OLC4, OLC4 and OLC5, EC1 and EC2, LOL3 and LOL4, LOL4 and LOL5, PER1 and PER2, and PER4 and PER5, they presented estimates below 0.3 demonstrating low intensity. In this context, the correlation between AOC4 and AOC5 presented an estimate between 0.3 and 0.5, which presents a moderate result.

It is also observed that Knowledge Acquisition and Transformation has a high-intensity correlation with Organizational Learning Culture (standardized estimate of 0.856 and significant p-value of 0.000).

The correlation between Knowledge Acquisition and Transformation with Team Cohesion (standardized estimate of 0.527 and significant p-value of 0.000) demonstrates high intensity between the constructs, which corroborates with

the perspective of Woerkom and Sanders (2010) regarding the team cohesion construct influencing knowledge sharing.

Regarding Knowledge Acquisition and Transformation and Affective Organizational Commitment (standardized estimate of 0.383 and significant p-value of 0.000), a moderate correlation is considered. That said, it is worth emphasizing that the affective commitment construct deals with variables that involve the individual's perception of the organization to understand their loyalty, the way of dealing with organizational problems, the meaning of the institution, and their state of belonging to work (Allen; Meyer, 1990), which corroborates with Lipshitz, Popper, and Friedman (2002), who expose that commitment is necessary for the learning stages to occur, and as defined by Can çado, Moraes, and Silva (2006). They argue that, through affective organizational commitment, there is a desire to exert considerable effort in favor of the organization and the effort to acquire and transform knowledge.

Organizational learning culture comprises the way of perceiving, thinking, and feeling the problems that are disseminated to workers to interpret their environment, referring to the storage of past experiences that can be useful (Walsh and Ungson, 1991).

As far as teams are concerned, they are competent in creating adaptations in processes, programs, and organizational practices (Barette *et al*., 2012). Thus, the team cohesion construct constructed by Wendt, Euwema, and Emmerik (2009) seeks to understand if people trust their work groups, if they treat each other with respect and are friendly, if they cooperate, work as a team, are willing to share resources, and whether they are proud to belong to the institution.

The results determine that the correlation between organizational learning culture and team cohesion is significant (p-value of 0.000), positive and strong (Standardized estimate of 0.606), which corroborates with Mantiri (2013) when exposing that culture is related to several factors that affect the learning process.

From the findings, it is possible to determine that the organizational learning culture is associated with affective organizational commitment. This correlation is positive, significant (p-value of 0.000), and of moderate intensity (0.393), which corroborates with Mowday, Porter, and Steers (1982) when they indicate that the organizational learning culture is related to affective commitment.

Considering the correlation that involves affective organizational commitment with team cohesion, it is known that the greater the affective commitment, the greater the perception of employees regarding the organizational learning potential in the institution (Santos, 2009); it is assumed that they are more prone to team cohesion.

It is noteworthy that affective commitment arises from a psychological state necessary for learning to occur (Lipshitz; Popper and Friedman, 2002), establishing the link between the individual and the entity (Can çado, Moraes, and Silva, 2006) and favoring the achievement of goals.

On the other hand, team action is understood as the affinity between the members of the group and their identification with the group (Organ *et al*., 2006). Team cohesion facilitates this knowledge-sharing process in the quest to improve performance (Woerkom and Sanders, 2010).

Considering the proposed integrated model results, a positive and significant correlation (p-value of 0.000) with moderate intensity (standardized estimate of 0.355) is identified between affective organizational commitment and team cohesion.

Therefore, the greater the team cohesion, the greater the commitment of the collaborators, and the greater the affective commitment of the workers, the greater the group cohesion.

5. Conclusion

The main contribution of this research is to propose an organizational learning model (Figure 02). This study identified an important influence of the antecedents in organizational learning and consequent performance. These relationships are not local but national in scope and are perceived in different contexts. The results can contribute to promoting the interaction of stakeholders in the performance of Brazilian public higher education institutions through organizational learning.

5.1 Theoretical Implications

The integration between different predecessors enhances organizational learning and generates a competitive advantage.

In the context of professors from public higher education institutions, one of the contributions was the identification that the antecedents of organizational learning influence learning at an organizational level, which, in turn, influences performance.

The validation and proposal of an integrated model (Figure 02) to analyze the antecedents and consequences of organizational learning in higher education institutions contributes to the advancement of science. Additionally, correlations suggested by the AMOS® software were tested, demonstrating that there are combinations between the constructs that precede organizational learning that higher education institutions must observe to benefit from organizational learning. A significant correlation was found between learning and performance.

Therefore, this study contributes to science by concluding that the predecessors of organizational learning are vectors for the generation of competitive advantage in developing effective institutions.

Provisioning an analysis framework with the measurement model and the structural model with statistical validity is another academic contribution of the research. Thus, the proposed integrated model can be replicated in different contexts.

5.2 Practical Implications

Regarding managerial contributions, the proposition of an integrated model is highlighted, which makes it possible to evaluate the constructs that precede organizational learning and their consequences from the perspective of generating competitive advantage through performance.

Thus, the proposed integrated model (Figure 02) demonstrates that performance improvement will occur, among other ways, when higher education institutions develop the antecedent constructs of organizational learning and their respective correlations in institutional routines.

The present research makes it possible to identify areas of potential intervention, monitor actions taken, evaluate the evolution of learning, verify the degree of institutionalization of the constructs, and verify the correlation between the antecedents and the measures of learning and performance.

As for the social implications, from the integrated model, managers will have information capable of influencing the construction of programs and policies related to learning, making it possible to deliver a better product to society. The research supports the use of organizational learning background practices to improve performance and fulfill the social function of public higher education institutions.

In this sense, more efficient and effective public institutions are sought to obtain better performance and adopt the guidelines found in the research.

5.3 Limitations and Future Studies

Despite having relevant findings, the research is limited in demonstrating a reflection of the researched moment, analyzing the perception of the reality of the sample, and avoiding inferences regarding the population of professors from higher education institutions.

Another limitation is related to the types of organizational learning addressed, and the correlation of antecedents and consequences with learning at an individual and group level can be investigated.

Although the literature has supported the direct correlation between team cohesion and organizational learning construct, this research demonstrates that this correlation is not significant and can be the subject of future studies.

Considering that the present research investigated professors' perceptions, future studies can analyze the perspective of administrative technicians and students from higher education institutions.

As for the theoretical framework, other databases can be used that allow new constructs and different results for future research. We encourage the inclusion of other antecedents in the model to improve the performance impact.

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