

**MANAGEMENT PRACTICES, LEADERSHIP AND ORGANIZATIONAL SCHOOL
CLIMATE: PERCEPTIONS OF HIGH SCHOOL TEACHERS**

***PRÁTICAS DE GESTÃO, LIDERANÇA E CLIMA ESCOLAR ORGANIZACIONAL:
PERCEPÇÕES DE DOCENTES DO ENSINO MÉDIO***

***PRÁCTICAS DE GESTIÓN, LIDERAZGO Y CLIMA ESCOLAR ORGANIZACIONAL:
PERCEPCIONES DE LOS PROFESORES DE SECUNDARIA***



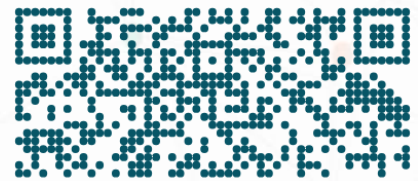
Adriano MORO¹
e-mail: amoro@fcc.org.br

Flávia Maria de Campos VIVALDI²
e-mail: flamacavi@gmail.com

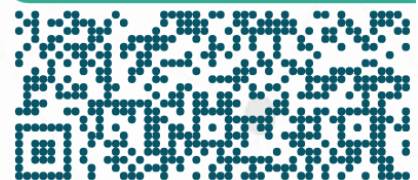
Raquel VALLE³
e-mail: rvalle@fcc.org.br

How to reference this paper:

MORO, A.; VIVALDI, F.; VALLE, R. Management practices, leadership and organizational school climate: Perceptions of high school teachers. **Revista @ambienteeducação**, São Paulo, v. 17, n. esp. 1, e023013, 2024. e-ISSN: 1982-8632. DOI: <https://doi.org/10.26843/ae.v17iesp.1.1305>



@ambienteeducação



Submitted: 19/12/2023

Revisions required: 27/03/2024

Approved: 04/04/2024

Published: 17/05/2024



ARTICLE SUBMITTED TO THE SIMILARITY SYSTEM

Editors: Prof. Dr. Margarete May Berkenbrock Rosito
Prof. Dr. Aleksandro do Nascimento Santos
Prof. Dr. Ecleide Cunico Furlanetto
Prof. Dr. Maria Conceição Passeggi

Deputy Executive Editor: Prof. Dr. José Anderson Santos Cruz

¹Carlos Chagas Foundation (FCC), São Paulo – SP – Brazil. Researcher in the Department of Educational Research at the Carlos Chagas Foundation.

²Vera Cruz Institute, São Paulo – SP – Professor in the postgraduate program on Interpersonal Relationships in School: from Socio-emotional Skills to Ethical Personality.

³Carlos Chagas Foundation (FCC), São Paulo – SP – Brazil. Statistician in the Department of Educational Research at the Carlos Chagas Foundation.

ABSTRACT: The article presents the construction of evaluation indicators of the organizational school climate and management and leadership practices, with analysis of multiple conceptual perspectives: school climate, leadership, and management practices at school. In a sample of 1,301 teachers from two states: Espírito Santo and Piauí, participants in the Management Practices, Educational Leadership and Quality of Education in High Schools in Brazil (PGLEQ) research, the variables of management and leadership practices were analyzed as well as organizational school climate. Three sets of associations were investigated: correlations of organizational climate indicators, management, and leadership practices, and the correlations between the two sets of indicators. The results indicate statistically significant associations, and each indicator measures their respective constructs. Thus, the indicators and their items provide reflective elements capable of mobilizing the school, based on the perceptions of its actors, to invest in the general improvement of the institution.

KEYWORDS: Evaluative indicators. Organizational school climate. School leadership. Management practices.

RESUMO: *O artigo apresenta a construção de indicadores avaliativos do clima escolar organizacional e das práticas de gestão e lideranças, com análise das múltiplas perspectivas conceituais: clima escolar; liderança e práticas de gestão na escola. Em uma amostra composta por 1.301 docentes de dois estados brasileiros, Espírito Santo e Piauí, participantes do estudo Práticas de Gestão, Liderança Educativa e Qualidade da Educação em Escolas de Ensino Médio no Brasil (PGLEQ), foram analisadas variáveis relacionadas às práticas de gestão e liderança, bem como ao clima escolar organizacional. Investigou-se três conjuntos de associações: as correlações dos indicadores do clima organizacional; das práticas de gestão e liderança; e as correlações entre os dois conjuntos de indicadores. Os resultados apontam associações estatisticamente significativas e cada indicador mede seus respectivos constructos. Assim, os indicadores e seus itens propiciam elementos reflexivos capazes de mobilizar a escola, a partir das percepções de seus atores, a investirem na melhoria geral da instituição.*

PALAVRAS-CHAVE: *Indicadores avaliativos. Clima escolar organizacional. Liderança escolar. Práticas de gestão.*

RESUMEN: *El artículo presenta la construcción de indicadores de evaluación del clima escolar organizacional y de las prácticas de gestión y liderazgo, con análisis de múltiples perspectivas conceptuales: clima escolar; Prácticas de liderazgo y gestión en la escuela. En una muestra de 1.301 docentes de dos estados: Espírito Santo y Piauí, participantes de la investigación Prácticas de Gestión, Liderazgo Educativo y Calidad de la Educación en Escuelas Secundarias de Brasil (PGLEQ), se analizaron las variables de las prácticas de gestión y liderazgo, así como las organizativas. clima escolar. Se investigaron tres conjuntos de asociaciones: correlaciones de indicadores de clima organizacional; prácticas de gestión y liderazgo; y las correlaciones entre los dos conjuntos de indicadores. Los resultados indican asociaciones estadísticamente significativas y cada indicador mide sus respectivos constructos. Así, los indicadores y sus ítems brindan elementos reflexivos capaces de movilizar a la escuela, a partir de las percepciones de sus actores, para invertir en la mejora general de la institución.*

PALABRAS CLAVE: *Indicadores evaluativos. Clima organizacional escolar. Liderazgo escolar. Prácticas de manejo.*

Introduction

This paper addresses the development of evaluative indicators designed to identify crucial elements of two fundamental dimensions of educational work, essential for ensuring quality education: organizational climate and management and leadership practices in the school environment.

The concept of school climate encompasses various distinct and complementary conceptual definitions, particularly when the goal is to understand the totality or to approach the fundamental elements that constitute the school universe. In this context, it is possible to highlight different evaluative perspectives of this phenomenon, including the measurement of academic climate, disciplinary climate, social and relational climate, classroom climate, and organizational climate.

Each of these evaluative possibilities of school climate can contemplate the specificities inherent in the dynamics of the educational environment. For example, the organizational school climate includes the set of perceptions and expectations experienced and shared by education professionals (teachers, management team members, staff) about the internal environment of the institution and all its operational dynamics, and the way in which individuals perceive this environment and their relationships, which can significantly interfere with the overall functioning of the educational unit, and bring significant changes in the relationships among school actors (Mattos, 2019; Moro, 2020).

Several scholars (Anderson, 2017; Correia, Sá, 2021; Daniëls; Hondeghem; Dochy, 2019; Gandolfi; Stone, 2018; Khajeh, 2018; Moro, 2020) have pointed out an essential relationship between management and leadership practices and their impacts on organizational relationships, especially when considering elements such as motivation, influence, objectives, goals, and outcomes, which are directly related to the organizational school climate.

Carvalho (1992) emphasizes the importance of being mindful of the possible influences that organizational climate can have on the dynamics of the school and, particularly, on leadership behavior.

[...] the organizational climate would, therefore, result from the perception that the members of the organization have about these variables of structure, process, and product. Simultaneously, these perceptions that the organization's members make of the organization itself condition each one's organizational behavior. And they interfere directly '[...] with the style of leadership, motivation, interaction patterns, the process of goal setting, communication patterns, decision-making processes, control procedures, and finally, performance levels (Carvalho, 1992, p. 29, our translation).

Corroborating this perspective, Lück (2017) asserts that the school principal has a strong influence on the institution's organizational climate, particularly when considering the relationships between leadership styles and climate. If, on one hand, the principal adopts a passive stance in the face of daily demands and challenges, the organizational climate will be uncommitted and bureaucratized. On the other hand, if the principal is authoritarian and makes decisions without openness to dialogue, the overall conditions of the school will be guided by this tendency. A third approach considers the dynamics of the principal's actions, who is attentive to demands and committed to sharing their actions, increasing the likelihood that these will also be the actions of the teachers.

The concept of leadership involves the ability to motivate and inspire people to collaborate voluntarily. Leadership practices play a crucial role in promoting academic success, developing effective pedagogical practices, managing educational resources, and creating a positive school environment (Fullan, 1996, 2003; Leithwood *et al.*, 2004).

Correia and Sá (2021) highlight that leadership influences the dynamics of organizations and is crucial for organizational climate, noting that positive climates are associated with the leadership of directors.

Given the complexity of these two constructs related to the school environment, this study focused on identifying central elements present in the evaluative items of the questionnaire constructed and applied in the research Management Practices, Educational Leadership, and Quality of Education in Brazilian High Schools (PGLEQE)⁴. For this purpose, we considered the set of items that measure the conditions and characteristics of the school (quality of instruction; instructional climate; safe and orderly climate; team participation in decision-making throughout the school; school culture, among others) characterized in the said research as mediating variables, for the composition of the indicators of organizational school climate, as well as the items related to the management and leadership practices of the school, noted as independent variables, for the structuring of the leadership indicators.

Thus, our general objective was to structure indicators capable of facilitating associations between the organizational school climate and the practices of school management and leadership from the data collection in 139 schools, in two Brazilian states: Espírito Santo

⁴ For more detailed information about the Research, see Oliveira *et al.* (2024) in the opening article of this dossier, “*Dossiê: Práticas de Gestão, Liderança Educativa e Qualidade da Educação em Escolas de Ensino Médio no Brasil*” published in this issue..

and Piauí. The questionnaires aimed at teachers were considered for this study, totaling 1,301 respondents.

Method

This work utilized data from a segment of the questionnaire answered by high school teachers, within the scope of the PGLEQE research, which was carried out in a sample of schools from the states of Piauí and Espírito Santo. Therefore, the first point to emphasize is that, as it is not a representative sample (neither of Brazil nor even of the states considered), the results presented do not reflect the characteristics of the perceptions of high school teachers from these two federal units. On the other hand, the considerable number of teachers (1,301) who participated in the research allowed us to conduct a robust investigation of the set of items of the instrument and thus operationalize two complex concepts, through the construction of indicators.

Several adjustments were needed in the original databases provided by the PGLEQE research for the analyses described below to be possible. It is important to note that, considering the objective of this study, the data from both states (ES and PI) were used together. Thus, the first challenge was to unify a single database of the responses from the teachers of both states since the information (data and variable dictionary for about 250 items) was provided in two databases that were not exactly alike.

Once this information was unified, careful work was undertaken to ensure the adequacy and consistency of the database, which included several steps, among which we can highlight: **Inversion:** The scoring of items presented in the opposite direction to the others was reversed; **Standardization:** A standardization of the "yes" and "no" response scales was carried out, as in the original instrument these were presented with different scorings. **Correction:** The particular case of question 6 was corrected, where items 6.4 and 6.5 of the instrument were inverted in relation to the information contained in the variable dictionary. In summary, the scoring of all questions was adjusted so that for items with ordinal response categories, the alternatives were ordered from 1, 2, ..., n, with 1 always being the negative option (=worst case) and n always being the positive option (=best case).

Construction of Indicators for Organizational Climate and Management and Leadership Practices

After a preliminary analysis of the complete content of the instrument, conducted by experts in the two constructs, the initial sets of items to be used in the construction of the indicators were established. For organizational climate, 51 items from the original questionnaires were chosen. For management and leadership practices, 75 items were selected.

As a methodology for creating the indicators, the strategy of analysis was to combine an Exploratory Factor Analysis (EFA) (Damásio, 2012; Hair *et al.*, 2009; Urbina, 2007) with the theoretical content analysis behind each item, meaning statistical techniques of EFA were employed as a starting point for the creation of the indicators, but the final composition of each was only defined after assessing their theoretical cohesion.

With a relatively large initial number of items for the construction of the indicators, totaling 126, and with the objective of optimizing the results of the Exploratory Factor Analysis (EFA), which is only effective when the variables are highly correlated with each other, the first step of the analysis consisted of examining the behavior of the correlation matrix of these two sets of items. This is due to the fact that, despite the differences between a school's organizational climate and management and leadership practices, one would not expect to find very low correlations between items that assess the same central construct. It is important to note that, in the process of constructing the indicators, which did not involve inferential procedures, the unit of analysis considered was the teacher.

There is no consensus on what would constitute acceptable levels of correlation between pairs of items measuring the same construct because although mathematically, the correlation coefficient can vary between -1 and 1, it is a measure whose magnitude varies according to the field of knowledge to which the construct belongs. Generally, in Social Sciences, a correlation of at least 0.3, in absolute values, is used as a desirable threshold. However, as the initial proposal was to exclude only items that had very low correlations with the other items in the set, we opted for a less rigorous criterion, namely, only excluding items that presented many correlations below 0.1.

Consequently, defining what would be considered "many" correlations was also necessary, as this is an arbitrary issue. This work defined a high quantity as 20% of the correlations violating this criterion. Therefore, considering that for organizational climate, 50 pairs of correlations were calculated for each item and for management and leadership practices 74 pairs, cut-off points of 10 and 14 items were defined, respectively.

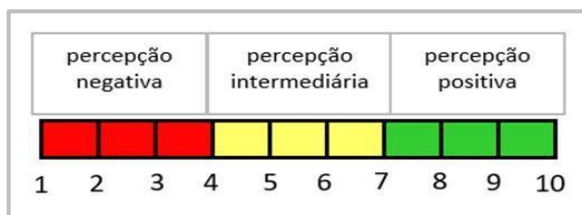
In addition to evaluating the individual correlation pairs of each item, another criterion for retention included the condition that the highest value observed among all correlation pairs of the item had to be at least 0.3, meaning items that did not show any correlation above 0.3 with the others were also removed from the set.

After excluding the items that violated the criteria established in the first stage of the analysis, the second step in constructing the indicators was to conduct an Exploratory Factor Analysis (EFA), using the Principal Component method with Oblimin rotation, to investigate the new set of items candidates to compose the indicators for organizational climate, and another to assess the new set of items for management and leadership practices. In the analysis of the results of both EFAs, both statistical criteria and the evaluations of experts, who performed the theoretical interpretation of each identified factor, were considered. At the end of this stage of the process, some factors were excluded, and some items were reallocated or eliminated.

The third and final step in the construction of the indicators was the performance of individual EFAs, conducted for each set of items identified in the composition of the factors established in the previous stage. This third step aimed to refine and adjust the results obtained in the joint EFA, since the factors originally identified underwent some theoretical reformulations. This final processing resulted in the exclusion of a few more items.

Once the composition of each indicator was finally defined, they were interpreted and named by the experts. The scores for each individual were calculated using factorial scores through the regression method. However, this method provides values on an original scale with a mean of 0 and variance equal to the square of the multiple correlation between the estimated scores and the actual values of the factors. Since this scale is not very intuitive, we opted to perform a linear transformation on the scores of each indicator, so that the final scores were distributed on a scale ranging from 1 to 10, without altering the original relationships between them. With this transformation of the scores, we proposed a qualitative interpretation of the results obtained for each indicator, as illustrated in Figure 1.

Figure 1 – Suggested qualitative interpretation for the proposed indicators⁵



Source: Authors' creation (2023).

Investigation of the relationships between the indicators produced in the research

Once the scores for each individual on each of the indicators proposed in this research were calculated, the score for each school was then estimated based on the average score of its respective teachers. Therefore, the unit considered in evaluating the relationships between the proposed indicators was the school (139 units).

To determine the possible relationships between leadership practices and elements of the organizational school climate from the perspective of high school teachers, we opted to evaluate the Pearson correlation coefficients (Chen; Popovic, 2002; Kozak, 2009; Rodgers; Nicewander, 1988;) between the respective indicators. The use of other statistical techniques, such as Regression Analysis or even Confirmatory Factor Analysis, would presuppose prior theoretical knowledge about possible causal effects between the two constructs under investigation. Such relationships are still in the process of being consolidated in the specialized literature, and therefore, these analyses were not utilized.

We chose to investigate three sets of associations: correlations within the set of organizational climate indicators, correlations within the set of management and leadership practice indicators, and correlations between the two sets of indicators. The first two sets of correlations were analyzed because, as their respective indicators address the same construct, it would be expected that all would be correlated with each other. Thus, this analysis aimed to corroborate this aspect, in addition to empirically signaling which elements of the organizational climate are most associated with each other, and which management and leadership practices.

⁵ Written in red: Negative perception; Written in yellow: Intermediate perception; Written in green: Positive perception.

Results

In the first stage of constructing the organizational climate indicators, of the initial 51 items, nine items were excluded from the set because they showed 10 or more pairs of correlations below 0.1 and/or a maximum observed correlation among the pairs less than 0.3. Similarly, among the initial 75 items on management and leadership practices, two items were excluded because they exhibited 14 or more pairs of correlations below 0.1 and/or a maximum observed correlation among the pairs less than 0.3. The list of excluded items is shown in Table 1.

Chart 1 – List of items excluded in the first stage of indicator construction

ORGANIZATIONAL CLIMATE	MANAGEMENT AND LEADERSHIP PRACTICES
8.1. Complete High School	
8.3. Enter Private Higher Education	
8.4. Enroll in technical courses before completing High School	
9.2. I am satisfied with the size of the class(es) assigned to me	14.6. Records teacher absences and lateness, reporting to higher authorities when necessary.
9.3. Sometimes, I consider it a waste of time to give my best in this school	17.3. Do not assign teachers tasks unrelated to their teaching duties.
9.8. I am thinking about transferring to another school	
9.9. If I could go back, I would have chosen another school	
9.10. I have little to do to improve my students' learning	
9.11. When I think about my future, I would like to hold a management position in this school	

Source: Authors' creation (2023).

Note: Items 8.1, 9.10, and 9.11 were excluded based on both criteria.

It is important to emphasize that the quality of these items or other psychometric aspects is not being evaluated in this work. Only correlation coefficients were analyzed, and based on the results obtained, the assessment is that they do not appear to be measuring the same construct as the other 42 items in the organizational climate set, or the same construct as the other 73 items in the management and leadership practices set.

The next step in the construction of the indicators was to perform an Exploratory Factor Analysis (EFA) to investigate the new set of 42 items for climate and another EFA to investigate the new set of 73 items for leadership practices.

The initial joint EFA of the items related to organizational climate indicated an initial solution with 8 factors. The Bartlett's sphericity tests⁶ ($p < 0,001$) and the KMO measure⁷ (0,952) proved to be quite adequate. The proportion of variance explained in this solution was 59.1%. However, interpreting each of the factors, it was observed that the last two, besides being mathematically less significant⁸, consisted of only two items each and did not have a theoretical meaning.

Therefore, we chose to consider only the first six factors from the initial solution at this stage, with changes incorporated by the experts in Factors 1 and 3 to improve their theoretical interpretation (item 7.1 was removed from Factor 1, and items 2.1 and 3.7 were respectively removed and included in Factor 3).

The initial EFA of the 73 items related to management and leadership practices indicated an initial solution with 9 factors. The Bartlett's sphericity tests ($p < 0.001$) and the KMO measure (0.982) also proved to be quite adequate. The proportion of variance explained by the solution with 9 factors was 63.2%. However, it was observed that Factor 9 shared the only item that presented a significant factor loading with another factor (Factor 3), in which the item was considered due to having the highest load. Therefore, our choice was to consider only the first eight factors defined by the EFA. After the analysis by the experts, changes were incorporated into three factors to improve their theoretical interpretation (item 12.1 was removed from Factor 1; items 15.1 and 17.7 were removed from Factor 2, and items 16.1 and 17.6 were removed from Factor 3).

In the final stage of indicator construction, individual Exploratory Factor Analyses (EFA) were performed to finalize the composition of each indicator and to calculate the factorial scores. Following the assessment by experts, three more items were removed from the Organizational Climate indicators (item 3.3 from Factor 2; item 3.7 from Factor 3, and item 9.1 from Factor 6) and one item was eliminated from the set of indicators for Management and Leadership Practices (item 17.9 from Factor 3). Thus, 34 items were used in the composition

⁶ Bartlett's Test of Sphericity assumes the null hypothesis that all variables are perfectly independent of each other. If this hypothesis is rejected, it can be concluded that there is some type of association between the variables, meaning they jointly measure one or more constructs. Therefore, Bartlett's Test should be statistically significant ($p < 0.05$).

⁷ The Kaiser-Meyer-Olkin (KMO) measure varies between 0 and 1 and represents the proportion of variance in the variables that can be explained by underlying factors or latent traits. The closer this value is to 1, the more suitable the data are for conducting an Exploratory Factor Analysis (EFA). According to the literature, a KMO value is considered good starting from 0.7; very good from 0.8, and excellent from 0.9.

⁸ The observed eigenvalues were just above 1 and exhibited low percentages of explained variance, especially considering the solution after rotation.

of the 6 indicators of Organizational Climate and 64 in the composition of the 8 indicators of Management and Leadership Practices. The final list of indicators and their evaluative items is found in Table 2.

Chart 2 – Composition of the Organizational Climate and Management and Leadership Practices Indicators

INDICATOR	ITEM LIST
ORGANIZATIONAL CLIMATE	
1- Interpersonal relations at school	7.5 to 7.11 (7 items)
2- Teacher professional involvement	3.1, 3.2, 3.5, 3.6, 3.8 to 3.13 (10 items)
3- Institutional investment for learning	2.2 to 2.5 (4 items)
4- Teachers' relations with school professionals	6.1 to 6.5 (5 items)
5- Teachers' relations with students and their parents	6.6, 6.7, 7.2, 7.3 (4 items)
6- Teacher self-actualization	9.4 to 9.7 (4 items)
MANAGEMENT AND LEADERSHIP PRACTICES	
1- Proactivity	12.2 to 12.14, 14.4, 14.5 (15 items)
2- Diagnostic and monitoring	15.2 to 15.5, 15.8 (5 items)
3- Attention to people and structure	16.2 to 16.10, 17.1, 17.2, 17.4, 17.5, 17.7, 17.8 (15 items)
4- Sense of respect and justice	14.7 to 14.10 (4 items)
5- Direct pedagogical involvement	13.1 to 13.4 (4 items)
6- Mobilizing stance	10.1 to 10.7 (7 items)
7- Assertiveness	14.1 to 14.3, 15.6, 15.9 (5 items)
8- Sense of cooperation	11.1 to 11.9 (9 items)

Source: Authors' compilation (2023).

Investigation of Relationships Between the Produced Indicators in the Research

With the indicators defined, scores were calculated for each individual participant. Notably, there was generally little variability in teachers' perceptions across all proposed indicators. Subsequently, the average score for each school evaluated in the study was estimated. The results obtained for the set of schools are presented in Table 1.

Table 1 – Descriptive Measures of the Proposed Indicators for the 139 Schools, by State

INDICATOR	PIAUI			ESPÍRITO SANTO		
	mín	máx	mean (d.p.)	mín	máx	mean (d.p.)
ORGANIZATIONAL CLIMATE						
1- Interpersonal relationships at school	6,6	9,2	8,0 (0,6)	6,2	9,2	8,0 (0,7)
2 - Professional teacher engagement	6,0	9,3	8,0 (0,7)	7,1	9,4	8,2 (0,6)
3 - Institutional investment in learning	5,0	9,6	7,7 (1,0)	6,7	9,9	8,8 (0,7)

4 - Teachers' relationship with school staff	7,2	10,0	8,9 (0,5)	6,9	10,0	9,2 (0,8)
5 - Teachers' relationship with students and parents	5,1	8,5	7,1 (0,7)	5,2	9,0	7,1 (0,8)
6 - Teacher self-fulfillment	5,5	9,8	8,6 (0,7)	7,0	9,7	8,5 (0,6)
MANAGEMENT AND LEADERSHIP PRACTICES						
1 - Proactivity	6,4	10,0	8,9 (0,7)	7,1	10,0	9,2 (0,6)
2 - Diagnostic and monitoring	4,0	9,4	7,5 (1,0)	4,7	9,9	8,0 (1,0)
3 - Attention to people and structure	6,6	9,9	8,7 (0,7)	7,1	10,0	9,2 (0,6)
4 - Sense of respect and justice	8,3	10,0	9,5 (0,4)	7,5	10,0	9,4 (0,6)
5 - Direct pedagogical involvement	2,2	6,4	4,7 (0,9)	2,6	7,7	4,9 (1,1)
6 - Mobilizing posture	7,1	10,0	8,9 (0,7)	6,2	10,0	9,2 (0,7)
7 - Assertiveness	6,6	9,8	8,8 (0,7)	7,7	10,0	9,3 (0,5)
8 - Sense of cooperation	6,7	9,8	8,6 (0,6)	6,3	9,9	8,9 (0,7)

Note: 69 schools in Piauí and 70 schools in Espírito Santo were evaluated. However, the indicator *Teachers relationship with school staff* could only be calculated for 68 schools in PI and 59 in ES due to missing values, particularly for the item "vice-principal", which seems to be absent in several schools. Source: Authors' elaboration (2023).

It is evident that the indicator 'Sense of respect and justice' scored the highest average among the group of schools evaluated, while the 'Direct pedagogical involvement' indicator stands out for its lower average scores. It is also observed that almost all indicators have slightly higher averages in ES schools than in PI.

On the other hand, if instead of considering the scores presented in Table 1, the qualitative interpretation of the indicators suggested in Figure 1 is considered, it can be seen (frequency distribution tables not presented in this article) that in the vast majority of schools evaluated (generally, more than 90%) the teachers have, on average, a positive perception of the indicator. When the same previous analysis is separated by state, it is noted that the frequency distributions of the schools in the three categories of teachers' perceptions are quite similar in the two evaluated states.

Finally, we will analyze the associations between the indicators produced in the research. It is important to highlight that all correlations between the indicators proposed in this work were statistically significant at a level of 5%. The only exception was the correlation between the indicators Relationship between teachers and school professionals and Direct

pedagogical involvement, which presented a descriptive level of 0.232. However, we understand that, in parallel with statistical significance, it is also necessary to evaluate the magnitude of these associations. Because the indicators proposed in this work are based on perceptions, we can consider that correlations greater than 0.5 already point to essential associations. However, we chose to interpret and discuss only the most vital relationships (above 0.6).

Analysis of strong associations of Organizational School Climate indicators

Although we have highlighted that all associations are statistically significant, we will reflect on those with the highest correlation rates.

Table 2 – Associations between Organizational School Climate Indicators

INDICATORS	INDICATORS	CORRELATION
1 - Interpersonal relationships at school	6 - Teacher self-actualization	0,675
2 - Teacher professional engagement	6 - Teacher self-actualization	0,614
3 - Institutional investment in learning	2 - Teacher professional engagemen	0,555
4 - Teachers' relationship with school staff	1 - Interpersonal relationships at school	0,439
5 - Teachers' relationship with students and parents	1 - Interpersonal relationships at school	0,577

Source: Authors' elaboration (2023).

From Table 2 above, we can observe that the highest correlation among the indicators of organizational school climate is between indicators 1 and 6, namely Interpersonal relationships at school and Teacher self-actualization, at 0.675. For illustrative purposes, the description of these indicators follows.

According to Kalkan *et al.* (2020), a school consists of diverse individuals with varied sociocultural characteristics, permeated by their own rules, values, and objectives. Viewing the school as a social organization necessitates an emphasis on the importance of interpersonal relationships and their multiple possibilities for experiences within its environment. From this perspective, the climate is characterized by individual and shared perceptions about the dynamics of everyday school events, which can change according to feelings of belonging, satisfaction, mood, and particularly, the quality of interpersonal interactions among all who inhabit the institution (Lück, 2017; Moro, 2020).

Teacher self-actualization encompasses levels of satisfaction regarding the performance of their duties as educators, their relationship with the work environment, professional involvement among peers, and all these elements together impact the perceptions that constitute the organizational school climate. As this climate is perceived and experienced, it will have implications on the quality of the dynamics of pedagogical practices, rates of absenteeism, dropout, and teacher turnover (Fernandes, *et al.*, 2023; Oliveira, 2018).

Chart 3 – Set of Evaluative Items for Indicator 1: Interpersonal Relationships at School

How do you rate the following aspects of your school:	Response Options (Scoring)
7.5. The relationship between teachers and pedagogical coordination	Very poor (1) Poor (2) Fair (3) Good (4) Very good (5)
7.6. The relationship between teachers and the administration	
7.7. The relationship between students and staff/employees	
7.8. The relationship between teachers and staff/employees	
7.9. The relationship between the administration and the staff/employees	
7.10. The relationship between the administration and the students	
7.11. The relationship between the administration and the parents of the students	

Source: Authors' elaboration (2023).

According to Table 3, the set of seven items that make up the first indicator of organizational climate involves measuring how good the relationships are between the various school stakeholders involved in the daily life of the school. In other words, these items aim to assess the teachers' perceptions of their relationships with the pedagogical coordination, the administration, the students, the staff/employees, and the parents/responsible for the students.

Chart 4 – Set of Evaluative Items for Indicator 6: Teacher Self-actualization

Please indicate your level of agreement with each of the following statements:	Response Options (Scoring)
9.4. I feel satisfied working at this school.	Strongly disagree (1)
9.5. I feel fulfilled with the work I develop at this school.	Disagree (2)
9.6. The organization of the school facilitates my work.	Agree (3)
9.7. There is a sense of collaboration among all who work at this school.	Strongly agree (4)

Source: Authors' elaboration (2023).

In Table 4, we see that Indicator 6, Teacher Self-actualization, consists of evaluative items that allow us to verify how teachers perceive their own performance in teaching, that is, whether they feel fulfilled and satisfied with their work at the school, as well as regarding the organization and sense of collaboration among professionals to ensure their work is well done.

From the strong association between these two organizational climate indicators, for example, we can infer that teachers' positive perceptions of interpersonal relationships with school stakeholders are directly related to their self-actualization in teaching.

Analyses of Strong Associations of School Management and Leadership Practices Indicators

As previously highlighted, among all statistically significant associations, our focus is on those that show the highest correlation indices. The following table presents the associations between the indicators.

Table 3 – Associations Between School Management and Leadership Practices Indicators

INDICATORS	INDICATORS	CORRELATION
1 - Proactivity	8 - Sense of Cooperation	0,857
2 - Diagnostic and Monitoring	7 - Assertiveness	0,808
3 - Attention to People and Structure	7 - Assertiveness	0,843
4 - Sense of Respect and Justice	1 - Proactivity	0,671
5 - Direct Pedagogical Involvement	2 - Diagnostic and Monitoring	0,620
6 - Mobilizing Posture	8 - Sense of Cooperation	0,890
7 - Assertiveness	1 - Proactivity	0,847

Source: Authors' creation (2023).

As shown in Table 3, the strongest associations between the indicators of school management and leadership practices occur between indicators 1, Proactivity, and 6, Mobilizing Posture, with indicator 8, Sense of Cooperation, showing correlation indices of 0.857 and 0.890, respectively. Next, we will analyze what each of these indicators contributes to the practices of management and leadership.

Proactivity and sense of cooperation are concepts often explored from a business perspective by authors focused on organizational psychology, team management, leadership, and organizational behavior (Covey, 2022; Goleman, 1995). In the educational context, these themes are especially considered in discussions about characteristics and styles of school management (Lück, 2013).

Proactivity refers to taking initiative and acting in advance, even before a request or demand arises. Proactive people do not wait for instructions but look for opportunities, identify problems, and propose solutions (Frankl, 1997). Some characteristics of proactivity include: anticipating problems and actively seeking solutions, taking responsibility for one's own work and outcomes, the initiative to learn and develop continuously, and active engagement in

improving processes and practices—actions of obvious relevance in the development of educational work

Cooperation in the school environment refers to the ability of members of the educational community to work together in a collaborative, balanced, and harmonious manner in order to achieve common objectives. This involves the active participation of teachers, students, parents, and other school team members in activities that promote learning, development, and the well-being of all. Cooperation entails constructive interactions arising from dialogic processes and the coordination of different perspectives. The presence of collaboration in educational literature is not recent and is generally related to advocating for active and participative education, with the sharing of knowledge and information; a readiness for open and effective collaboration with colleagues; a willingness to listen to and consider different perspectives; and the construction of a positive and inclusive work environment, as characteristics present in human interactions (Dewey, 1916; Freire, 1967, 1996; Johnson; Johnson, 2008; Piaget, 1973, 1998).

The combination of proactivity and cooperation can significantly contribute to a harmonious work environment and the formation of a more effective team. The association of these two traits tends to produce particularly powerful results in enhancing human relationships and developing a healthy learning environment. This occurs because the combination of these characteristics involves effective actions that impact essential dimensions of educational work, such as: the anticipation of problems, continuous innovation and improvement, the construction of a positive work environment, the achievement of common goals, and the strengthening of organizational culture. By promoting proactivity and cooperation in a team or work environment, leaders can create a dynamic that values individual initiative and collaboration, leading to better outcomes and a more positive organizational climate.

Next, let's observe the assessment items for Indicator 8 (Sense of Cooperation), which showed a strong association with the other two indicators (1 and 6 - Proactivity and Mobilizing Posture).

Chart 5 – Assessment Items for Indicator 8: Sense of Cooperation

Regarding collective work at this school, please indicate your level of agreement with each of the following statements about your principal:	Response Options (Scoring)
11.1. Communicates the purpose and objectives of the institution to the school community.	Strongly Disagree (1) Disagree (2) Agree (3)
11.2. Explain the reasons for implementing changes in school operations.	

11.3. Works with teachers to define concrete goals to achieve the political-pedagogical project.	Strongly Agree (4)
11.4. Demonstrates high expectations for the work teachers do with students.	
11.5. Foster's collaborative work among teachers.	
11.6. Promotes an environment of mutual trust among members of the school community.	
11.7. Promotes a caring environment among members of the school community.	
11.8. Supports all teachers, especially those facing more challenges in their teaching.	
11.9. Promotes participative management through representative teacher involvement when necessary.	

Source: Authors' creation (2023).

The assessment items for Indicator 8, as presented in the previous chart, illustrate that the essence of the indicator involves effective actions by the school principal in various areas: in communicating and engaging teachers with the institution's objectives; in enhancing the structure of the Political-Pedagogical Plan; in supporting and fostering collective work; in building an environment of mutual trust and care among all; and in implementing participative management. These characteristics explain the strong association of this indicator with Proactivity (Indicator 1) and Mobilizing Posture (Indicator 6) observed in the statistical analyses. Next, we will list the items related to Proactivity.

Chart 6 – Set of Assessment Items for Indicator 1: Proactivity

How often does the principal of your school:	Answer Options (scoring)
12.2. Propose strategies for all teachers to organize their work collectively.	Never (1) Rarely (2) Occasionally (3) Frequently (4)
12.3. Propose strategies for all teachers to have common schedules for meetings, study, and planning.	
12.4. Ensure teachers' participation in decisions affecting the quality of education.	
12.5. Ensure families' participation in decisions affecting the quality of education.	
12.6. Ensure students' participation in decisions affecting the quality of education.	
12.7. Clearly define and reinforce the duties and responsibilities of all staff members.	
12.8. Propose strategies for teachers at this school to work considering students' specific characteristics and needs at each educational stage.	
12.9. Help teachers learn from their mistakes.	
12.10. Encourage teachers to do their best.	
12.11. Get involved in integrating new teachers into the establishment.	
12.12. Behave professionally in his relationship with teachers.	
12.13. Incorporate teachers' interests and ideas into the school's educational project.	
12.14. Develop actions to encourage good teachers to remain at the establishment.	
14.4. Show concern for teachers' well-being.	
14.5. Encourage teachers to improve their classroom work.	

Source: Authors' creation (2023).

The set of 15 assessment items that comprise the Proactivity Indicator allows for measuring teachers' perceptions of the school principal's actions, a central figure of the management team. This indicator covers: strategies for organizing collective work among teachers, with pre-established times for meetings, studies, and planning; and ensuring access and participation of school actors in decisions that affect the quality of education, promoting a sense of shared responsibility.

Moving on to Indicator 6, Mobilizing Posture, this characteristic in management refers to the leadership's ability to inspire and motivate their team to achieve common goals. It is an approach that seeks to engage and involve team members, stimulating their enthusiasm and commitment to organizational goals (Lück, 2013). The mobilizing posture transcends mere task management; it involves inspiring actions and achieving results through positive encouragement, support, and alignment of purposes.

Key elements of the mobilizing posture in management include inspiring communication, encouraging the team's intrinsic motivation by recognizing their achievements and efforts, fostering the development of a team sense, setting challenging and achievable goals, encouraging inclusion and participation in important decisions, and creating a sense of belonging and commitment. The following chart will present the items related to the mobilizing posture indicator.

Chart 7 – Set of Assessment Items for Indicator 6: Mobilizing Posture

Rate your level of agreement with each of the following statements about certain characteristics of the principal of this school:	Answer Options (scoring)
10.1. Does a good job at this school.	Strongly disagree (1) Disagree (2) Agree (3) Strongly agree (4)
10.2. Has an encouraging and supportive demeanor towards teachers.	
10.3. Values and reinforces the work done by teachers.	
10.4. Interacts respectfully with students (at the entrance, in his office, during breaks).	
10.5. Is always available to those who seek him out.	
10.6. Shows openness and interest in listening to teachers.	
10.7. Is able to articulate the different ideas and opinions of the teacher group.	

Source: Authors' creation (2023).

Integrating cooperation with a mobilizing posture in school management fosters the development of a more cohesive educational culture where all community members are encouraged to contribute and achieve shared goals.

Correlations between Organizational Climate Indicators and Management and Leadership Practices Indicators

Finally, to answer our research question, the correlations between the two sets of indicators proposed in this study were calculated. The following table highlights in gray the highest correlations found for each of the 8 indicators of management and leadership practices.

Table 4 – Correlations between organizational climate indicators and management and leadership practices indicators

ORGANIZATIONAL CLIMATE DIMENSIONS	DIMENSIONS OF MANAGEMENT AND LEADERSHIP PRACTICES							
	1. Proactivity	2. Diagnostic and Monitoring	3. Attention to People and Structure	4. Sense of Respect and Justice	5. Direct Pedagogical Involvement	6. Mobilizing Posture	7. Assertiveness	8. Sense of Cooperation
1. Interpersonal Relationships at School	0,627	0,546	0,577	0,496	0,429	0,663	0,504	0,679
2. Professional Involvement of Teaching Staff	0,497	0,481	0,597	0,327	0,387	0,464	0,491	0,580
3. Institutional Investment in Learning	0,484	0,532	0,708	0,249	0,344	0,466	0,579	0,543
4. Teachers' Relations with School Staff	0,313	0,274	0,404	0,195	0,107	0,387	0,329	0,442
5. Teachers' Relations with Students and Parents	0,275	0,264	0,253	0,243	0,237	0,190	0,232	0,248
6. Teacher Self-Realization	0,487	0,465	0,537	0,482	0,412	0,622	0,452	0,662

Source: Authors' creation (2023).

It is evident that 6 out of the 8 indicators of management and leadership practices are more strongly associated with the “Interpersonal Relationships at School” indicator from the dimension of organizational climate. This signifies that effective management and leadership practices not only manage administrative processes but also cultivate positive relationships with team members, teachers, students, parents, and other school community members.

Ways in which interpersonal relationships intertwine with school leadership include effective communication; developing trustful relationships; the presence of empathy and respect as assumptions of the relationships; collaboration and teamwork; conflict mediation; community involvement; inclusion and diversity; and support for professional development

among other ways to humanize interactions and qualify relationships as constructive and respectful.

Final considerations

The school environment is a complex universe, permeated by multiple and complementary dimensions of the educational context. In considering phenomena as complex as school climate and the processes of leadership and management practices, we emphasize the need for caution when aiming to develop measurement tools, particularly of a subjective nature, with the goal of understanding the perceptions of those who experience the dynamics of the school environment.

In this regard, the current study operationalized the construction of evaluative indicators capable of highlighting central elements concerning essential dimensions of the school environment to promote quality education: organizational school climate and management and leadership practices.

From the selection of evaluative items from the questionnaire constructed and applied in the research “Management Practices, Educational Leadership, and Quality of Education in Brazilian High Schools” (PGLEQE), administered across a sample of 139 schools in two Brazilian states, Espírito Santo and Piauí, totaling 1,301 responding teachers, we followed a rigorous methodological path for the construction of such indicators. The procedures adopted involved the use of statistical techniques of Exploratory Factor Analysis (EFA) and analyses of the theoretical content behind each item.

To strengthen the statistical and theoretical robustness of the developed indicators, correlation coefficient analyses were conducted, investigating three sets of associations: the correlations within the set of organizational climate indicators, the correlations within the set of management and leadership practice indicators, and the correlations between these two sets of indicators. The results indicate that all associations are statistically significant, and the sets of evaluative items that compose each indicator accurately measure their respective constructs: 34 items grouped into six indicators for organizational climate and 64 items in the eight indicators for management and leadership practices.

It is hoped that these indicators and their evaluative items provide reflective elements capable of mobilizing the school, based on its members' perceptions, to invest in the overall

improvement of the institution, from promoting a positive organizational climate to implementing collaborative, democratic management with distributed leadership.

REFERENCES

- ANDERSON, M. Transformational leadership in education: a review of existing literature. **International Social Science Review**, [S. l.], v. 93, n. 1, p. 1-13, 2017. Available at: <https://www.jstor.org/stable/90012919>. Accessed in: 30 Nov. 2023.
- CARVALHO, L. M. **Clima de escola e estabilidade dos professores**. Lisboa: Educa, 1992.
- CHEN, P. Y.; POPOVIC, P. M. **Correlation**. London: Sage, 2002.
- CORREIA, P.; SÁ, S. Liderança do(a) Diretor(a) escolar e a sua relação com o Clima Organizacional. **Revista Multidisciplinar Humanidades e Tecnologias (FINOM)**, [S. l.], v. 28, n.1, p. 175-209, 2021. Available at: http://revistas.icesp.br/index.php/FINOM_Humanidade_Tecnologia/article/view/1525/1116. Accessed in: 30 Nov. 2023.
- COVEY, S. R. **Os 7 Hábitos das Pessoas Altamente Eficazes**. Santana de Parnaíba -SP: Editora BestSeller, 2022.
- DAMÁSIO, B. F. Uso da análise fatorial exploratória em psicologia. **Avaliação Psicológica**, [S. l.], v. 11, n. 2, p. 213-228, 2012.
- DANIËLS, E.; HONDEGHEM, A.; DOCHY, F. A review on leadership and leadership development in educational settings. **Educational research review**, [S. l.], v. 27, p. 110-125, 2019. Available at: <http://www.sciencedirect.com/science/article/abs/pii/S1747938X18300228>. Accessed in: 16 Nov. 2023.
- DEWEY, J. **Democracy and education**. New York: Institute for Learning Technologies (ILT), 1916. Available at: <https://www.gutenberg.org/files/852/852-h/852-h.htm> Accessed in 01 Apr. 2024.
- FERNANDES, F. S.; DAVIS, C.; PIMENTA, C. O.; MORO, A.; SILVA, V. G. da. Absente smo docente: Desa os para as pol ticas p blicas educacionais. **Cadernos de Pesquisa**, São Paulo, v. 53, 2023, e09880. Available at: <https://doi.org/10.1590/198053149880>. Accessed in: 23 Nov. 2023.
- FRANKL, V. E. **Em busca de sentido**. Petrópolis: Editora Vozes, 1997.
- FREIRE, P. **Educação como prática da liberdade**. São Paulo: Paz e Terra, 1967.
- FREIRE, P. **Pedagogia da autonomia**. São Paulo: Paz e Terra, 1996.

FULLAN, M. Leadership for change. *In*: LEITHWOOD, K. *et al.* (ed.). **International handbook of educational leadership and administration**, Dordrecht: Kluwer Academic Publishers, 1996. v. 2, p. 701-721.

FULLAN, M. **Liderar numa cultura de mudança**. Porto: ASA, 2003.

GANDOLFI, F.; STONE, S. Leadership, leadership styles, and servant leadership. **Journal of management research**, v. 18, n. 4, p. 261-269, 2018. Available at: http://www.researchgate.net/publication/340940468_Leadership_Leadership_Styles_and_Servant_Leadership. Accessed in: 20 Nov. 2023.

GOLEMAN, D. **Inteligência Emocional**. Rio de Janeiro: Objetiva, 1995.

HAIR, J. F. *et al.* **Análise multivariada de dados**. 6. ed. Porto Alegre: Bookman, 2009. Available at: <https://www.scielo.br/j/rbedu/a/jshd86G9PYQYGJLpJZqpJdC/?format=pdf&lang=pt>. Accessed in: 30 Nov. 2023.

JOHNSON, D. W.; JOHNSON, R. T. Social Interdependence Theory and Cooperative Learning: The Teacher's Role. *In*: GILLIES, R. B.; ASHMAN, A. F.; TERWEL, J. (ed.) **The Teacher's Role in Implementing Cooperative Learning in the Classroom**. New York: Editora Springer, 2008.

KALKAN, Ü.; AKSAL, F.; GAZI, Z.; ATASOY, R.; DAĞLI, G. The relationship between school administrators' leadership styles, school culture, and organizational image. **Sage open**, [S. l.], v. 10, n. 1, 2020. Available at: <http://journals.sagepub.com/doi/10.1177/2158244020902081>. Accessed in: 30 Nov. 2023.

KHAJEH, E. H. A. Impact of leadership styles on organizational performance. **Journal of human resources management research**, Lincoln University College, 2018. DOI: 10.5171/2018.687849.

KOZAK, M. What is strong correlation? **Teaching Statistics**, [S. l.], v. 31, n. 3, p. 85-86, 2009.

LEITHWOOD, K.; LITORAL LK; ANDERSON, S.; WAHLSTROM, K. **Como a liderança influencia a aprendizagem dos alunos**. Nova York: Fundação Wallace, 2004. Available at: <https://wallacefoundation.org/topics/school-leadership>. Accessed in 16 Dec. 2023.

LÜCK, H. **Avaliação e Monitoramento do Trabalho Educacional**. Petrópolis, RJ: Editora vozes, 2013.

LÜCK, H. **Gestão da cultura e do clima organizacional da escola**. Petrópolis, RJ: Vozes, 2017.

MATTOS, C. A. C. Clima organizacional sob a perspectiva dos gestores de Instituições Federais de Ensino: uma investigação multivariada em Belém, Pará, Brasil. **Revista Organizações em Contexto**, [S. l.], v. 15, n. 30, p. 53-81, 2019. Available at:

<http://www.metodista.br/revistas/revistas-metodista/index.php/OC/article/view/8313>.
Accessed in: 30 Nov. 2023.

MORO, A. **A Avaliação do Clima Escolar no Brasil: Construção, Testagem e Validação de Questionários Avaliativos**. Curitiba: Appris, 2020.

OLIVEIRA, A. C. P.; CARVALHO, C. P. Gestão escolar, liderança do diretor e resultados educacionais no Brasil. **Revista Brasileira de Política e Administração da Educação**, [S. l.], v. 23, 2018. Available at:
<https://www.scielo.br/j/rbedu/a/jshd86G9PYQYGJLpJZqpJdC/abstract/?lang=pt>. Accessed in: 16 Dec. 2023.

PIAGET, J. **Estudos sociológicos**. São Paulo: Companhia Editora Forense, 1973.

PIAGET, J. **Sobre a pedagogia**, São Paulo: Casa do Psicólogo, 1998.

RODGERS, J. L.; NICEWANDER, W. A. Thirteen Ways to Look at the Correlation Coefficient. **The American Statistician**, [S. l.], v.42, n.1, p. 59-66, 1988.

URBINA, S. **Fundamentos da testagem Psicológica**. Porto Alegre, RS: Artmed, 2007.

CRediT Author Statement

Acknowledgements: We extend our gratitude to the team of researchers involved in the PGLEQE for their valuable exchange of ideas and reflections during the research technical workshops.

Funding: The PGLEQE activities were financially supported by the Unibanco Institute.

Conflicts of interest: All study participants signed forms for voluntary and informed participation. The Unibanco Institute mediated cooperation that facilitated the research's entry into the education departments of the states of Espírito Santo and Piauí.

Ethical approval: Not applicable.

Data and material availability: The original databases from the PGLEQE research are not available due to confidentiality and compliance with the General Data Protection Law.

Author's contributions: Adriano Moro and Flávia Vivaldi: data analysis and interpretation; linkage with the theoretical framework and drafting of the text; Raquel Valle: organization of the database; statistical processing; data analysis and interpretation, and drafting of the text.

Processing and editing: Editora Ibero-Americana de Educação.
Proofreading, formatting, normalization and translation.

