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Impact of Leadership on Educational Governance: A Second-Order Analysis in Mexican Public Teacher Training Colleges

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Abstract

The purpose of this study was to determine the effect of transformational, transactional, and laissez-faire leadership subscales on the outcome variables (satisfaction, extra effort, and leadership effectiveness) in Public Teaching Schools in Mexico, using Bass and Avolio's theoretical model and second order structural modeling with latent variables (composites). A sample of 1,515 teaching and administrative staff was administered the "Worker's Sociodemographic and Organizational Data Questionnaire" and the "Adaptation to the Multifactor Leadership Questionnaire" (MLQ). The second-order Structural Equation Models enabled graphic and statistical analysis of the influence of leadership variables on outcome variables; transformational leadership had a significantly greater influence on outcome variables than transactional leadership (0.155), as measured by its standardized beta coefficient (0.828). These findings explained 0.94 of the variance in the R-squared value. Laissez-faire was dropped from the model due to its insignificance. Between laissez faire and administration by passive exception, substantial inverse bivariate correlations were discovered for all model subscales; nevertheless, a significant positive correlation was found between them. Cronbach's Alpha reliability coefficients greater than.70 and discriminant validity coefficients greater than 0.90 were achieved for each of the model's subscales. Despite growing global interest in transformational leadership, limited empirical evidence exists from Latin American contexts, particularly within Mexican educational institutions. This study addresses that gap, providing culturally relevant insights into how leadership styles can be leveraged to enhance organizational performance in public schools.

Keywords: *transformational leadership; transactional leadership; laissez faire leadership, job satisfaction, full range model.*

Introduction

The evolution of leadership theory reflects a shift from static, individual-centered models to more dynamic and context-sensitive frameworks. Early approaches, such as the Trait Theory in the early 20th century, focused on identifying inherent qualities that distinguished leaders from non-leaders (Stogdill, 1948). As criticisms of trait-based models grew, researchers turned to behavioral theories, exemplified by studies at Ohio State and the University of Michigan in the 1950s, which emphasized observable leadership behaviors (Fleishman, 1953; Likert, 1961). This gave rise to contingency theories in the 1960s and 1970s, such as Fiedler's Contingency Model (1967) and Hersey and Blanchard's Situational Leadership Theory (1969), which stressed the importance of aligning leadership style with situational factors. In the late 20th century, transformational leadership theory gained prominence, particularly through the work of Burns (1978) and later Bass (1985), who introduced the idea that leaders could inspire followers to exceed expectations by appealing to shared values and vision. This culminated in the development of the Full Range Leadership Model (Bass & Avolio, 1994), which integrates transformational, transactional, and laissez-faire leadership styles. This progression reflects an increasing awareness of the complex, interactive nature of leadership and its deep dependence on organizational and cultural context.

The Full Range Leadership Model that explains transformational leadership is one of the most extensively researched leadership styles (Farahnak et al., 2020; Garzon et al., 2024). The relationship between transformational, transactional leadership and organizational satisfaction is an increasingly popular topic among academics and practitioners (Kang, 2021; Bajcar and Babiak, 2022). A search of this topic in google scholar yielded 751,000 results. Findings indicate that leadership contributes to an institution's competitive advantage and it is relevant for organizational development (Manzour, et al, 2023; Li et al., 2019; Di Fabio, 2018), however, there is a research gap in Mexico concerning the role of transformational, transactional,

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laissez-faire leadership, and outcome variables on subordinates' extra effort and effectiveness using multivariate causal approaches under the SEM methodology of second order. Very few research has been done using this aproach in Mexico (Mendoza, et al., 2014).

Scholars and researchers have been particularly interested in the relationship between transformational and transactional leadership and organizational satisfaction. Findings indicate that leadership contributes to an institution's competitive advantage (Jeong, 2024; Li et al., 2019). Although the impact of transformational leadership on burnout has been researched (DiFabio, 2018), there is a dearth of research in Mexico examining the role of transformational, transactional, non-leadership, and management outcome variables on subordinates' extra effort and effectiveness. Transformational leadership is defined as a person's influence over others such that they actively make efforts to accomplish goals on their own (Yu et al., 2024; Boamah et al., 2018); it is also characterized as the ability to provide guidance and encouragement in obtaining an outcome (Jun and Lee, 2023; Kong et al., 2019). Additionally, it is defined as a leader's ability to motivate and inspire his subordinates to accomplish goals through the ideals, motivation, and expectations set by the leader (Tsapnidou et al., 2024; Vila-Vazquez et al., 2018). Thus, according to some scholars, transformational and transactional leadership are viewed as polar opposites on a continuum (Pérez, Arango, and Branch, 2008). Others, on the other hand, view transformational and transactional leadership as distinct characteristics that can coexist in the same leader (Madrigal, 2004).

Transformational leadership, as the most studied style of leadership across disciplines has the capacity to adapt to a variety of cultural contexts. Given the growing body of evidence demonstrating the beneficial effects of transformational leadership on a variety of school and high education outcomes related to the organization environment, teacher effectiveness, and student achievement, we wanted to investigate the factors that contributed to the outcome variables of transformational leadership.

Bass and Avolio's model of transformational leadership comprises thirteen dimensions, which are defined as the behaviors displayed by a leader. Six of these are indicative of transformational leadership. Idealized influence (Attributes), idealized influence (Behavior), motivational inspiration, intellectual stimulation, individual consideration, and psychological tolerance are all examples of idealized influence. The remaining three are transactional leadership, contingent reward, active exception management, and Passive exception management. Laissez-faire is another subscale of non-leadership. Three outcome variables were combined to assess the effect of leaders' transformational and transactional subscales on immediate followers or workers: Satisfaction, extra effort, and Effectiveness. Among the attributes that transformational leadership shows in order to motivate subordinates to change is idealized influence, also known as charisma, which Bernal (2000) defines as the adoration that followers have for their leader and how this inspires them to emulate him/her. Thus, the leader is elevated to the status of a role model, idealized for his or her distinctive personality and qualities. Charisma is defined as the capacity to elicit others' enthusiasm, trust, and respect. There are two facets to idealized influence: the leader's traits and behaviors.

In this Model, the leader inspires his people by establishing an appealing and stimulating vision. He creates and transmits a vision that inspires people by his example. This is accomplished through inspirational motivation, where the leader uses his devotion and excitement to entice his followers to work toward a common objective (Garcia-Rivera et al., 2011). The intellectual stimulus that the leader delivers to his followers is part of the transformational leadership Model.

Individual consideration is another part of transformational leadership. Each follower's requirement is considered individually. In this instance, the leader takes on the role of a coach, providing opportunities, a supportive climate, direction, and feedback to his subordinates, assigning responsibility and sufficiently enabling them, and communicating an ideal and passionate vision of the future (Cheng & Cao, 2023). Psychological Tolerance refers to a sense of humor as a factor that buffers tension and stress and helps resolve conflicts, learns to tolerate others' mistakes, the leader is patient and kind, and helps create appropriate environments for dealing with problems without minimization (Mendoza et al., 2014). Figure 1 illustrates the whole Bass and Avolio model.

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Transformational leadership					Transactional leadership			Laissez faire		Outcome variables		
Charisma		Motivational Inspirational	Intellectual stimulation	Individual consideration	Psychological tolerance	Contingent reward	Administration by active exception	Administration by passive exception	Laissez faire	Satisfaction	Extra effort	Effectiveness
Attributes	Behavior											
1	2	3	4	5	6	7	8	9	10	11	12	13

Figure 1. Transactional and transformational leadership model of Bass and Avolio.

Source: taken from Mendoza, I. (2017), p. 112.

This article is divided into four sections. The first section, the introduction, describes the problem gap and importance. The Methods section describes the measurement instrument, the application procedure, the population, sample and analysis methods applied. Thirdly, the results are presented using structural equation modeling where a robust model is observed that adequately describes the outcome variables. Finally, conclusions and discussion are offered, in which the findings are compared to those of other studies that demonstrate significant similarities or differences.

Leadership and Higher Education in Mexican Teaching Schools

The importance of transformation in higher education has been recognized by education experts in recent years (Thaer 2025; Filho et al.,2018). The term "transformation" in Higher Education refers not just to economic structures and ways of operation, but also to the role of the economy in society (Lang et al, 2019). Along with their traditional and obvious mission of educating and training individuals, universities and teaching schools are increasingly positioning themselves as catalysts for innovation and progress in society (Lang et al., 2019). Leaders have a substantial impact on how people perceive their positions and their performance (Su, 2019). Transformational Leaders have demonstrated their ability to influence their followers in the education sector by enhancing the perception, meaning, and relevance of their jobs through their words and deeds (Shang and Huang, 2022). Studies demonstrate that when the relevance of a task is emphasized through the influence of Transformational Leaders, it results in increased job engagement, which promotes innovative job behavior (Hassan et al., 2019) Bass and Avolio (1994) defined TLs as "leaders who have a growing awareness of what is right, good, important, and beautiful; when they assist followers in elevating their needs for achievement and self-actualization; when they foster in followers a high level of moral maturity; and when they inspire followers to act in ways that are not self-serving but benefit their group, organization, or society" (Sun et al., 2017).

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In the late last century, as part of the school reform and improvement initiatives, scholars produced many leadership models in an attempt to discover "effective leadership" that would improve student learning results. This comprises instructional (Hallinger, 1992), transformational (Leithwood, 1994) participative (Dunning, 1993), managerial (Spillane, 2001), and, more recently, dispersed (Spillane, 2001 Judge and Piccolo, 2004). Several of these models (e.g., instructional; moral leadership) were designed specifically for use in educational settings. The remainder were created to be used in educational and non-educational situations (e.g., managerial; participative leadership). The transformational leadership (TL) model is one of the most extensively researched of the second type.

Problem Statement

The changes generated in society make us think that the education given to young people in the different educational institutions must be different from the education that was oriented in the past, we are in a different world and therefore the change is necessary and imminent. The challenges that arise must be overcome in order to provide the new generations with a relevant, inclusive and excellent education; educational leaders must lead the transformation that generates the expected results so that the efforts of the state, society and families report results.

In educational institutions, transformational leaders are required to change the coexisting conditions and inspire their collaborators to give their best to educate new generations with results in accordance with the challenges imposed.

Transformational leadership is considered a resource that can have an impact on the results in organizations, and educational organizations are no exception. According to Bass and Avolio's (1994) transformational leadership model, the leader can achieve: the satisfaction of the employees' work needs, know the needs of their employees, facilitate the employees' contribution to the organization's effectiveness and that the performance of the leader and the employee are integrated to achieve the proposed goals and objectives.

The importance of transformational leadership is evident because it inspires employees motivationally, influences their daily lives, stimulates them intellectually taking into account individual conditions, and makes them psychologically tolerant, transcending the exchange relationships and expectations generated in the work interaction. however, the impact that transformational leadership of managers generates in the results achieved with the work of their followers is unknown.

Empirically, the relationship between transformational leadership and outcome variables has been studied by authors in México and Colombia using first-order structural equation models, in other words without using the subscales of each category; in this research a second-order hierarchical analysis is used using the subscales of the Bass and Avolio model.

Research Question

Do the transformational, transactional and laissez faire leadership subscales significantly influence the outcome variables (satisfaction, extra effort and leadership effectiveness) of workers in Public Normal Schools in the State of México, under the theoretical model of Bass and Avolio, with the use of a second-order structural modeling?

Justification

The main contribution of the present study focuses on analyzing the influence of transformational, transactional and laissez faire leadership subscales of bosses on outcome variables of teaching and administrative staff of 36 Public Normal Schools in the State of México, using Bass and Avolio's theory; being analyzed under a second order structural equation modeling, with latent variables. The above justifies

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a novel contribution in the administrative field of education in Mexican contexts, considering that there may be few studies on the subject, using this methodology.

Objective

This study aims to examine the specific influence of the subscales within transformational, transactional, and laissez-faire leadership styles on key organizational outcomes—namely job satisfaction, extra effort, and perceived leadership effectiveness—among faculty and administrative staff in Public Tranining Teacher´s Schools in Mexico. Grounded in Bass and Avolio's Full Range Leadership Theory, the analysis will be a second-order structural equation modeling with latent variables to provide a nuanced understanding of how distinct leadership dimensions shape institutional performance in the educational sector.

Hypotheses

"Transformational, transactional and laissez faire leadership subscales significantly influence the outcome variables (satisfaction, extra effort and leadership effectiveness) of employees in Public Mexican Trainning Teacher´s Schools using the Bass and Avolio Theory and structural modeling of second order latent variables, with the use of latent variables (composites)".

Methods

Type of study

This is a quantitative ex post facto cross-sectional research, because the different leadership subscales were evaluated in a single period of time (with no follow-up) and somewhat explanatory through the use of Second Order Structural Equation Models (Hair, 2010).

Unit of analysis

The total sample consisted of 1,515 workers from 36 Normal Schools in the State of México who reported the leadership of 102 principals. Their socio demographic and organizational data are as follows: Sex: 51.2 % (f = 776) of the followers belong to the female sex, while 47.9 % (f = 725) is male and approximately 1 % (f = 14) did not answer. Age: 39.7 % (f = 601) aged 46 years or older, followed by 23.7 % (f = 359) aged 41 to 45 years, 15.3 % (f = 232) aged 36 to 40 years, 10.3 % (f = 156) aged 31 to 35 years, 7.3 % (f = 111) aged 26 to 30 years, 0.6 % (f = 9) under 18 years, and 0.5 % (f = 8) did not answer. Marital status: 63.8% (f = 966) were married, followed by 21.8% (f = 331) single, 7.1% (f = 107) divorced, 4.2% (f = 64) common-law, 1.5% (f = 23) reported other, 1.1% (f = 17) widowed, and 0.5% (f = 7) did not answer. Last degree: 45.9% (f = 696) undergraduate, 43% (f = 652) graduate, 2.8% (f = 42) high school, 2.4% (f = 36) high school, 1.8% (f = 27) did not answer, 1.3% (f = 19) elementary school, and 0.3% (f = 4) none. Number of languages mastered: 78.2 % (f = 1185) one, 18.2 % (f = 275) two, 1.6 % (f = 24) three or more, 2 % (f = 31) did not answer. Type of worker: 79 % (f = 1,198) is a base worker, 16.4 % (f = 248) interim, 2.1 % (f = 32) trust, 1.4 % (f = 21) other, 1.1 % (f = 16) did not answer. Shift: 63.9% (f = 968) mixed, 29.2% (f = 443) morning, 5.6% (f = 85) afternoon, and 1.3% (f = 19) did not answer. Seniority in the institution: 52.3% (f = 792) more than 10 years, 20.9% (f = 317) less than 3 years, 14.6% (f = 221) 6 to 10 years, 11.6% (f = 176) 3 to 5 years, and 0.6% (f = 9) did not answer. Length of service: 37.7% (f = 572) more than 10 years, 35.2% (f = 533) less than 3 years, 13.9% (f = 210) 3 to 5 years, 12.8% (f = 194) 6 to 10 years, 0.4% (f = 6) did not answer. Category: 56.7% (f = 859) are teaching staff and 43.7% (f = 656) are administrative staff.

Procedure

The "Adaptation to the Multifactor Leadership Questionnaire" (MLQ), Version 5, complemented with a questionnaire with questions referring to their socio demographic and organizational data was applied to a sample of followers (immediate workers of the bosses), teaching and administrative staff (n= 1,515), from 36 public teacher training schools in the State of México. They were invited to participate voluntarily in the

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study, asking them to answer the instrument, guaranteeing the absolute confidentiality of their answers. The information from the questionnaire, once answered on optical reading sheets, was integrated into a database that was edited and analyzed in the Statistical Package for the Social Sciences (SPSS), version 23 for Windows, and SmartPLS, version 3, was used for structural modeling.

Instrument

"Worker Sociodem4ographic and Organizational Data".

The questionnaire integrates the capture of socio demographic variables and organizational variables. Each of them is included below: Socio demographic (Sex, age, marital status, last degree of studies and number of languages mastered). Organizational: (Type of worker, Shift, Seniority in the institution, Seniority in the position and Category).

"Adaptation to the Multifactor Leadership Questionnaire (MLQ), Version 5.

It was derived from Version 5 of the "Multifactor Leadership Questionnaire" (MLQ), developed by (Bass & Avolio, 1997); at Binghamton University in New York.

The "Adaptation to the Multifactor Leadership Questionnaire" has been validated, validated and standardized in México, in different types of organizations, both public and private. It consists of six subscales of Transformational Leadership, three subscales of Transactional Leadership, one subscale of Laissez Faire and three subscales of Outcome Variables. There are two versions of the same instrument; the one oriented to the boss or leader's own response ("Self"), and the one oriented to the immediate followers or workers ("Seen by others") about their bosses' behaviors. Both versions were adapted to the Mexican context by Mendoza (2005).

Both versions of the instrument are each composed of a total of 52 items or questions. It is made up of four items for each of the 13 corresponding subscales. Each item is answered in writing under a Likert-type form as follows: 0 = Never, 1 = occasionally, 2 = usually, 3 = frequently and 4 = Always. The minimum value for each subscale is 0, while the maximum value is 16.

Statistical analysis and hypothesis testing

Understanding the multivariate nature of the research question and hypothesis, it was necessary to use Second Order Structural Equation Models, which would allow graphically and statistically analyzing the causal influence of different variables or subscales of Leadership from the Bass and Avolio Model, on outcome variables in the investigated personnel, with the use of SmartPLS. In parallel, several Multiple Regression were performed and their respective Standardized Beta Coefficients were generated.

In order to evaluate the validity of the instrument, the confirmatory factor analysis was performed for each of the subscales of the instrument, achieving satisfactory results in terms of construct validity. For the reliability analysis of the instrument, the Composite Reliability (CF) coefficients were obtained. The statistics were complemented with the Discriminant Validity Analysis, Pearson's correlation coefficients moment - product was performed. Having in mind the theoretical fundaments, the second order structural modeling were developed under the reflexive method; being able to calculate the composite indices in the second order constructs.

The Structural Equations Model developed allowed visualizing the exogenous or independent variables (Transformational, Transactional and Laissez faire Leadership) and the endogenous or dependent variables (Outcome Variables (Satisfaction, Extra Effort and Effectiveness), with their corresponding questions or items that integrate each one of them, evaluating these hypotheses jointly, and confirming the empirical findings of Bass and Avolio's theoretical model.

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Validity and reliability

Table 1 shows the results of the descriptive statistics (mean, standard deviation), the reliability analysis (Cronbach's alpha), validity (discriminant validity) and the correlation matrix. Cronbach's Alpha coefficients in each of the instrument's subscales fluctuated from 0.80 to 0.94, which is at very good levels (Dionne et al, 2003). The above allows affirming that the instrument is reliable, having consistency in its results.

The composite reliability coefficients (CF) in each of the subscales of the instrument fluctuated from 0.87 to 0.96, while the average variance extracted (AVE) ranged from 0.62 to 90, the discrimination coefficient (square root of AVE) fluctuated from 0.00 to 0.91, which confirms the validity of the instrument at an optimal level. It can be affirmed that the instrument has adequate levels of validity, confirming that it measures what it is intended to measure.

The Pearson Moment - Product Correlation coefficients allowed observing significant inverse correlations between the subscales E8 Administration by passive exception and E9 Laissez faire with all the subscales of the Bass and Avolio Model; while the correlations between them are positive and significant. The above confirms the theoretical and empirical elements of the authors of this research (Mendoza, García-Rivera and Uribe, 2014; Anderson et al, 2007) with alphas above .70.

The results of the descriptive statistics, reliability, validity and correlations between the subscales of the second-order structural equation model are presented in Table 1.

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Table 1.
Descriptive statistics, reliability, validity and correlations between the subscales of the second-order structural equation model.

Leadership styles	Subscales	Media	Desviación estándar	Alfa de Cronbach	rho_A	FC	AVE	E1	E2	E3	E4	E5	E13	E6	E7	E8	E9	E10	E11	E12
Transformational Leadership Subscales	E1 Idealized Influence (Attribute)	13.95	4.80	0.94	0.94	0.96	0.90	0.9												
	E2 Idealized Influence (Behavior)	14.25	4.66	0.94	0.94	0.95	0.84	944**	0.9											
	E3 motivational inspiration	13.64	4.72	0.94	0.94	0.96	0.84	892**	907**	0.9										
	E4 Intellectual stimulation	13.65	4.72	0.92	0.92	0.95	0.87	904**	915**	939**	0.9									
	E5 Individual consideration	13.63	4.99	0.93	0.93	0.95	0.83	854**	868**	900**	904**	0.9								
	E13 Psychological tolerance	13.34	4.96	0.93	0.93	0.95	0.83	832**	821**	872**	869**	871**	0.9							
Transactional Leadership Subscales	E6 Contingent Award	10.65	5.03	0.93	0.93	0.95	0.82	721**	720**	782**	766**	767**	735**	0.9						
	E7 Management by exception active	13.70	4.58	0.90	0.90	0.93	0.78	866**	882**	871**	878**	840**	795**	730**	0.9					
	E8 Management by passive exception	8.86	4.06	0.80	0.80	0.87	0.62	369**	384**	359**	360**	371**	325**	225**	384**	0.8				
Laisses-faire	E9 Laissez-faire	8.03	3.76	0.85	0.85	0.90	0.69	502**	514**	489**	500**	509**	450**	370**	513**	608**	0.8			
Variables of result	E 10 Satisfaction	13.15	4.60	0.93	0.93	0.95	0.82	859**	872**	899**	896**	874**	860**	756**	851**	353**	495**	0.91		
	E 11 Extra effort	13.43	4.94	0.93	0.93	0.96	0.88	882**	893**	939**	922**	897**	870**	797**	872**	359**	486**	903**	0.94	
	E 12 Effectiveness	13.79	4.72	0.94	0.94	0.96	0.86	899**	910**	900**	907**	880**	857**	728**	890**	374**	519**	896**	905**	0.93

Significant correction at the two-tailed level of 0.01
n= 1515
CF= Composite reliability
AVE = Average variance extracted
Main diagonal = Square root of AVE
Source: own elaboration

Results of the Testing of Research Hypotheses

Understanding the multivariate nature of the hypothesis, it was necessary to use second-order Structural Equation Models, which allowed graphically and statistically analyzing the causal influence of different variables or subscales of Leadership on Outcome Variables from the Bass and Avolio Model.

The structural equation model integrated each and every one of the subscales according to Bass and Avolio's theory, taking into account the research hypothesis. Table 2 and Figure 2 show the influence of the standardized beta coefficients and the expected correlation coefficients on the research hypothesis.

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Table 2. Influence and expected correlations on the research hypothesis

Endogenous dependent variables		Influence	Exogenous Independent Variables	
E1 Idealized Influence (Attribute)	Transformational Leadership Subscales	+	Variables of result Subscales	E 10 Satisfaction
E2 Idealized Influence (Behavior)				
E3 motivational inspiration				E 11 Extra effort
E4 Intellectual stimulation				
E5 Individual consideration				
E13 Psychological tolerance				E 12 Effectiveness
E6 Contingent Award	Transactional Leadership Subscales	+		
E7 Management by exception active				
E8 Management by passive exception				
E9 Laissez-faire	Laissez-faire	-		

Source: own elaboration

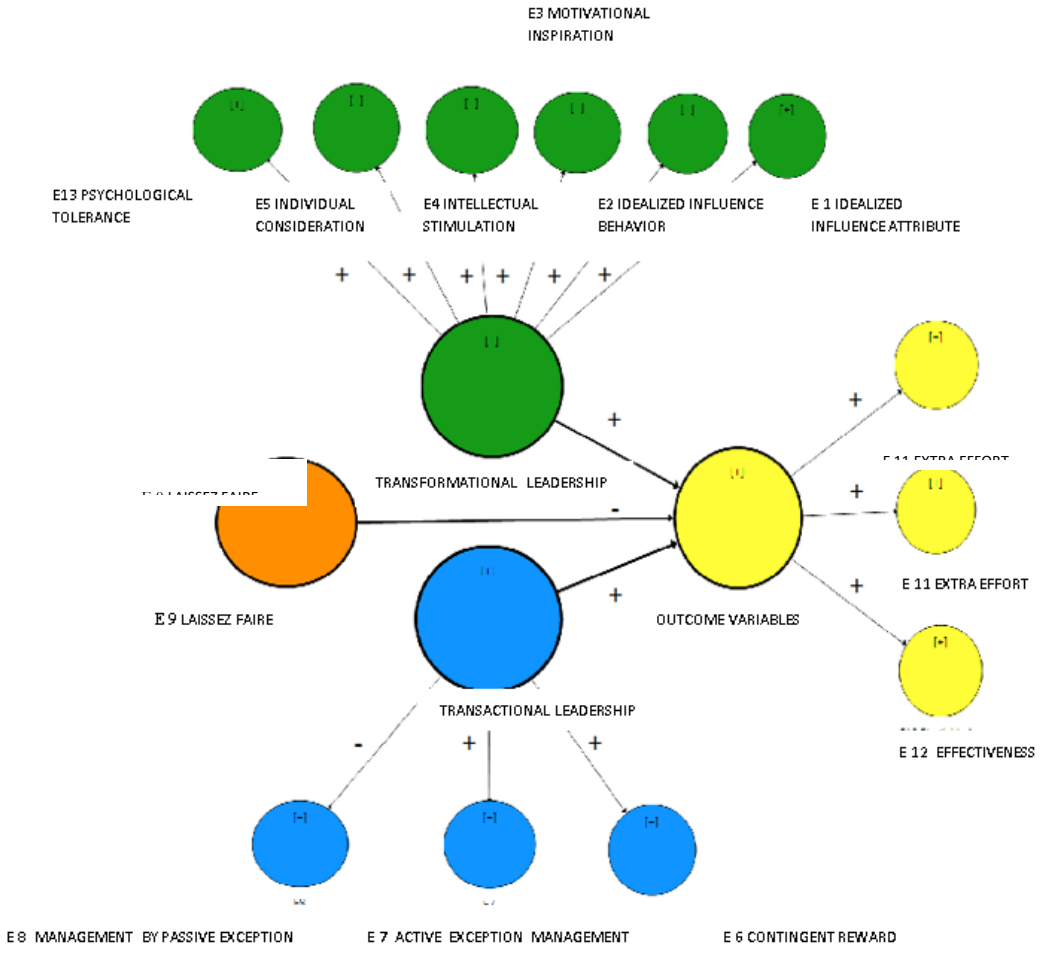

Figure 2. Correlations and expected influence on the Second Order Structural Equation Model from the research hypothesis.

Source: own elaboration.

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The performance of the Second Order Structural Equations Model allows us to observe the particular loadings of each subscale in the conformation of the major construct:

Transformational leadership, was settled by the following statistically significant subscales according to their factor loadings in order from highest to lowest: in first place E4 Intellectual stimulation (0.969), in second place E3 Motivational inspiration (0. 960), in third place E2 Idealized influence (Behavior) (0.957), in fourth place E5 Individual consideration (0.945), in fifth place E1 Idealized influence (Attribute) (0.949), and in sixth place by E13 Psychological tolerance (0.923).

Transactional leadership was made up of the following statistically significant subscales according to their factor loadings in order from highest to lowest: in first place, E7 Administration by active exception (0.926), in second place, E6 Contingent reward (0.888) and, in third place, inversely, E8 Administration by passive exception (- 0.531).

It is important to note the inverse statistical significance of these subscales with the second order transactional leadership construct, according to Bass and Avolio's theory.

The laissez faire was made up of its corresponding significant items: firstly, P1_E9 (0.868), secondly, P2_E9 (0.823), thirdly, P3_E9 (0.818) and fourthly, P4_E9 (0.793).

The outcome variables were made up of the following statistically significant subscales according to their factor loadings in order from highest to lowest: first, E12 Effectiveness (0.966), second, E10 Satisfaction (0.964) and third, E11 Extra effort (0.961).

Influence of transactional, transformational, laissez-faire leadership on outcome variables as second-order constructs

Transformational leadership has a significant direct influence on outcome variables, based on its standardized beta coefficient (0.28); transactional leadership has a significant direct influence on outcome variables, based on its standardized beta coefficient (0.155); while laissez faire has no significant influence. These transformational leadership and transactional leadership variables explain approximately 0.942 % of the explained variance of the outcome variables based on their R-squared.

Variance explained in the second-order constructs

Transformational leadership

The E1 Idealized influence (attribute) was composed of three significant items with factor loadings in the following order from highest to lowest: P2_E1 (0.955), P1_E1 (0.945) and P3_E1 (0.943). These items were able to obtain an R-squared of 0.901 of the explained variance of this subscale.

E2 Idealized influence (behavior) was composed of four significant items with factor loadings in the following order from highest to lowest: P1_E2 (0.935), P3_E2 (0.938), P4_E2 (0.926), and P2_E2 (0.866). These items were able to obtain an R-squared of 0.915 of the explained variance of this subscale.

E3 Intellectual stimulation was composed of three significant items with factor loadings in the following order from highest to lowest: P1_E3 (0.942), P3_E3 (0.932), and P2_E3 (0.916). These items were able to obtain an R-squared of 0.922 of the explained variance of this subscale.

E4 Intellectual stimulation was composed of four significant items with factor loadings in the following order from highest to lowest: P1_E4 (0.921), P4_E4 (0.918), P2_E4 (0.917), and P3_E4 (0.875). These items were able to obtain an R-squared of 0.939 of the explained variance of this subscale.

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E5 Individual consideration was composed of four significant items with factor loadings in the following order from highest to lowest: P1_E5 (0.93), P2_E5 (0.921), P4_E4 (0.903), and P3_E5 (0.9). These items were able to obtain an R-squared of 0.893 of the explained variance of this subscale.

The E13 Psychological tolerance was composed of four significant items with factor loadings in the following order from highest to lowest: P2_E13 (0.944), P3_E13 (0.941), P1_E13 (0.907), and P4_E13 (0.869). These items were able to obtain an R-squared of 0.852 of the explained variance of this subscale.

Transactional leadership

The E6 Contingent reward was made up of four significant items with factor loadings in the following order from highest to lowest: P2_E6 (0.917), P3_E6 (0.914), P1_E6 (0.905), and P4_E6 (0.885). These items were able to obtain an R-squared of 0.789 of the explained variance of this subscale.

The E7 Administration by active exception was composed of four significant items with factor loadings in the following order from highest to lowest: P1_E7 (0.904), P4_E7 (0.876), P2_E7 (0.873), and P3_E7 (0.869). These items were able to obtain an R-squared of 0.857 of the explained variance of this subscale.

The E8 Administration by passive exception was composed of four significant items with their factor loadings in the following order from highest to lowest: P1_E8 (0.834), P4_E8 (0.795), P3_E8 (0.784), and P2_E8 (0.734). These items were able to obtain an R-squared of 0.282 of the explained variance of this subscale.

Outcome Variables

E10 Satisfaction was made up of four significant items with factor loadings in the following order from highest to lowest: P4_E10 (0.916), P3_E10 (0.906), P2_E10 (0.902), and P1_E10 (0.901). These items were able to obtain an R-squared of 0.929 of the explained variance of this subscale.

E11 Extra effort was composed of three significant items with factor loadings in the following order from highest to lowest: P2_E11 (0.941), P1_E11 (0.937), and P3_E11 (0.931). These items were able to obtain an R-squared of 0.924 of the explained variance of this subscale.

E12 Satisfaction was made up of four significant items with factor loadings in the following order from highest to lowest: P3_E12 (0.933), P4_E12 (0.93), P2_E12 (0.925), and P1_E12 (0.911). These items were able to obtain an R-squared of 0.934 of the explained variance of this subscale.

To corroborate the significance of the second-order structural equation model with latent variables, it was necessary to perform the analysis using a Bootstraping sample, the Bootstraping results are presented in Table 3.

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Table 3. Performance of the second degree structural model having in mind a Bootstraping sample of the data

Subscales	original sample (O)	Sample average (M)	Standard deviation (STDEV)	T-Statistics (I O/STDEVI)	P Values
E9 Laissez faire_> Results variables	0.001	0.001	0.009	0.057	0.954
Transactional leadership_-> E6 Contingent Award	0.888	0.889	0.005	166.155	0
Transactional leadership_-> E7 Management by exception active	0.926	0.926	0.004	252.114	0
Transactional leadership_-> E8 Management by passive exception	-0.531	-0.532	0.021	25.828	0
Transactional leadership_-> Results variables	0.155	0.155	0.018	8.844	0
Transformational Leadership_> E1 Idealized Influence Attribute	0.949	0.95	0.004	267.538	0
Transformational Leadership_> E 13 Psychological tolerance	0.923	0.923	0.005	185.08	0
Transformational Leadership_> E2 Idealized Influence behavior	0.957	0.957	0.003	382.568	0
Transformational Leadership_> E3 motivational inspiration	0.96	0.96	0.002	398.214	0
Transformational Leadership_> E4 Intellectual stimulation	0.969	0.969	0.002	490.486	0
Transformational Leadership_> E5 Individual consideration	0.945	0.945	0.003	275.314	0
Transformational Leadership_> Result variables->	0.828	0.828	0.016	53.355	0
Result variables-> E 10 Satisfaction	0.964	0.964	0.002	418.304	0
Result variables-> E 11 Extra effort	0.961	0.961	0.002	458.572	0
Result variables-> E 12 Effectiveness	0.966	0.967	0.002	445.36	0

Source: own elaboration.

Table 3 shows that in the model, subscale E9 Laissez faire is not significant in explaining the outcome variables (P value = 0.954); therefore, it was necessary to exclude this subscale from the model. Therefore, the second-order model was run again and is presented in Figure 3.

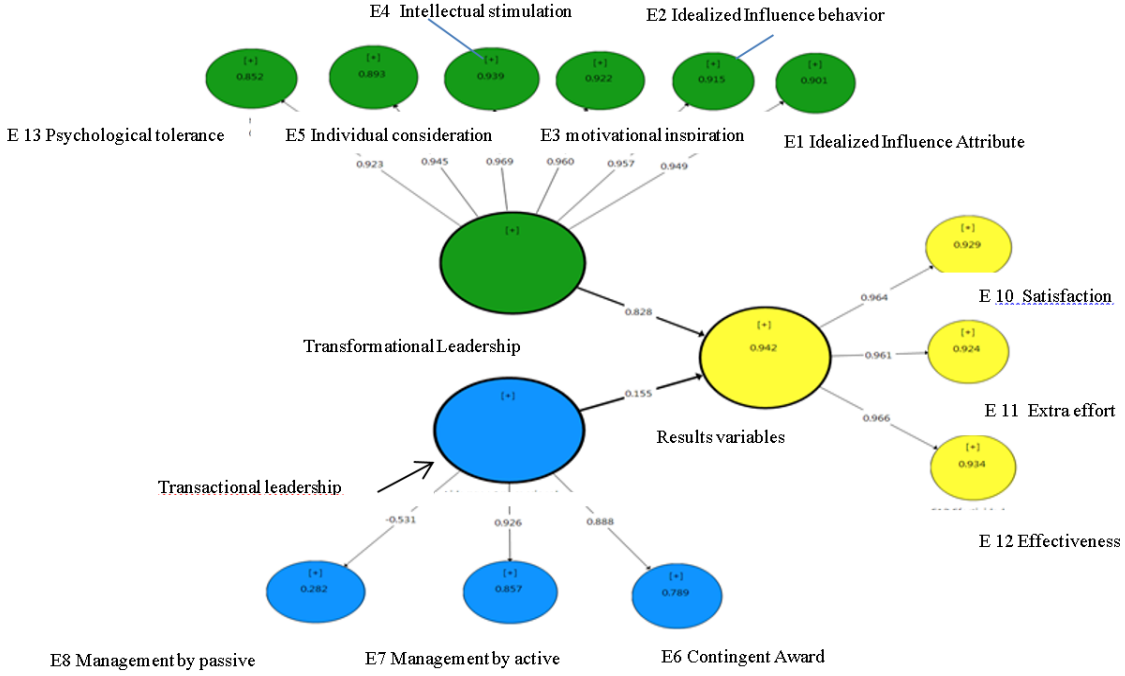

Figure 3: Second-order corrected model of the influence of transformational, transactional and laissez faire leadership subscales on outcome variables of teaching and administrative staff of 36 public teacher training schools in the State of Mexico.

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Source: Own elaboration.

The R squares referring to the variances of each of the second-order subscales were obtained and are presented in Table 4.

Table 4. Results of the R-squares of the model

Leadership styles	**Subscales**	**R Square**	**Adjusted R-squared**
Transformational leadership subscales	E1 Idealized Influence (Attribute)	0.90	0.90
	E2 Idealized Influence (Behavior)	0.92	0.92
	E3 motivational inspiration	0.92	0.92
	E4 Intellectual stimulation	0.94	0.94
	E5 Individual consideration	0.89	0.89
	E13 Psychological tolerance	0.85	0.85
Transactional leadership subscales	E6 Contingent Award	0.79	0.79
	E7 Management by exception active	0.86	0.86
	E8 Management by passive exception	0.28	0.28
Outcome variable		0.94	0.94
Outcome Variables subscales	E 10 Satisfaction	0.93	0.93
	E 11 Extra effort	0.92	0.92
	E 12 Effectiveness	0.93	0.93

Source: own elaboration.

In order to complement the validity analyses, it was necessary to perform the factor loadings analysis, to ensure that each of the items was integrated into its corresponding construct or subscale of Bass and Avolio's theoretical model of leadership. The results of this analysis are presented in Table 5.

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Table 5. Results of the analysis of the factor loadings of the items corresponding to each subscale of Bass and Avolio's theoretical model in the instrument.

Reactive

Reactivo	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13
P1_E1	0.946												
P2_E1	0.955												
P3_E1	0.943												
P1_E2		0.935											
P2_E2		0.866											
P3_E2		0.938											
P4_E2		0.926											
P1_E3			0.942										
P2_E3			0.916										
P3_E3			0.932										
P1_E4				0.921									
P2_E4				0.917									
P3_E4				0.875									
P4_E4				0.918									
P1_E5					0.93								
P2_E5					0.921								
P3_E5					0.9								
P4_E5					0.903								
P1_E6						0.905							
P2_E6						0.917							
P3_E6						0.914							
P4_E6						0.885							
P1_E7							0.904						
P2_E7							0.873						
P3_E7							0.869						
P4_E7							0.876						
P1_E8								0.834					
P2_E8								0.734					
P3_E8								0.784					
P4_E8								0.795					
P1_E9									0.868				
P2_E9									0.823				
P3_E9									0.819				
P4_E9									0.793				
P1_E10										0.901			
P2_E10										0.902			
P3_E10										0.906			
P4_E10										0.916			
P1_E11											0.937		
P2_E11											0.941		
P3_E11											0.931		
P1_E12												0.911	
P2_E12												0.925	
P3_E12												0.933	
P4_E12												0.93	
P1_E13													0.907
P2_E13													0.944
P3_E13													0.941
P4_E13													0.869

E1 Idealized Influence (Attribute): E2 Idealized Influence (Behavior), E3 Motivational Inspiration
E4 Intellectual esteem. E5 Individual consideration, E13 Psychological tolerance, E6 Contingent reward,
E7 Administration by active exception, E8 Administration by passive exception, E9 Laissez faire, E10 Satisfaction
E11 Extra effort, E12 Effectiveness

Source: Prepared by the Company.

As seen in Table 5, results show that Transformational leadership (0.828) has a greater influence than transactional leadership (0.155), based on its standardized beta coefficients on the outcome variables, explaining approximately 94% of its variance based on its R-squared. Laissez faire, on the other hand, did not have a significant influence on the outcome variables, so it had to be eliminated from the model.

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The second-order structural modeling with latent variables was able to corroborate theoretical elements of Bass and Avolio; such as the conformation of the transactional leadership construct integrated by a significant inverse subscale from its standardized beta coefficient (-0.531), being management by passive exception, while management by active exception (0.926) and contingent reward (0.789) have positive coefficients. Also, significant inverse bivariate correlations between laissez faires and management with all the subscales involved in the model, as well as significant direct correlations between them.

The instrument Adaptation to the Multifactor Leadership Questionnaire" (MLQ), Version 5, presented adequate levels of reliability from the use of reliability coefficients Cronbach's Alpha, Composite Reliability, rho_A; as well as validity from discriminant validity coefficients AVE Square Root, being able to be greater than 0.70 in all the subscales involved in the modeling.

Discussion

This study aimed to analyze the specific influence of transformational, transactional, and laissez-faire leadership subscales—based on Bass and Avolio's Full Range Leadership Theory—on key organizational outcomes such as job satisfaction, extra effort, and leadership effectiveness within Public Normal Schools in the State of Mexico. By employing second-order structural equation modeling with latent variables, the research offers a nuanced and robust understanding of how various leadership behaviors shape institutional performance in educational settings.

The findings provide strong empirical support for the dominance of transformational leadership in promoting favorable organizational outcomes. With a standardized beta coefficient of 0.828, transformational leadership demonstrated a significantly greater impact than transactional leadership (0.155), while laissez-faire leadership was statistically insignificant and removed from the final model. Among transformational subscales, intellectual stimulation, motivational inspiration, and idealized influence (both behavior and attribute) emerged as particularly influential, underscoring their importance in fostering staff engagement and performance.

From a theoretical perspective, this study extends Bass and Avolio's model by validating the distinct influence of leadership subcomponents in a Latin American educational context. The use of second-order modeling provided a deeper understanding of the structural relationships among leadership behaviors and outcome variables, which is rarely explored in Mexican educational research. These findings affirm the cross-cultural applicability of transformational leadership theory while also highlighting the need to contextualize leadership practice within local cultural frameworks, such as Mexico's collectivist and relational work environments.

In terms of professional and practical implications, the results emphasize the strategic importance of leadership development initiatives centered on transformational competencies. Educational leaders, especially principals and administrators, should be trained in behaviors such as inspiring a shared vision, offering intellectual stimulation, and providing individualized consideration. These skills are particularly vital in the face of rapid educational reform, evolving expectations, and the need for resilient school cultures. Institutions that invest in cultivating transformational leadership are more likely to foster job satisfaction, discretionary effort, and organizational effectiveness—key pillars of sustainable school improvement.

Nevertheless, this study is not without limitations. The cross-sectional design prevents the establishment of causality and does not account for potential changes over time. While the sample was extensive, it was geographically confined to the State of Mexico, limiting the generalizability of the findings to other regions or countries. Furthermore, the use of self-reported data, although supported by validated instruments, may be subject to social desirability or response biases.

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These limitations open several avenues for future research. Longitudinal studies could examine how leadership styles evolve over time and influence staff development and institutional outcomes in the long term. Comparative research across different states or countries in Latin America could enrich the cultural validity of leadership models. Additionally, integrating qualitative methods—such as interviews or ethnographic observations—could offer deeper insight into how leadership is enacted and experienced in educational environments. Finally, future work might explore how leadership interacts with other organizational variables such as teacher autonomy, empowerment, team cohesion, or innovation capacity, especially within the framework of educational quality and equity.

Conclusión

This study confirmed that transformational leadership exerts a stronger and more positive influence on organizational outcomes—job satisfaction, extra effort, and leadership effectiveness—than transactional or laissez-faire styles in Mexican teacher training schools. The significant standardized beta coefficient (0.828) of transformational leadership highlights its central role in enhancing staff engagement and performance. These results are consistent with findings by Garzón-Lasso et al. (2024), who demonstrated similar effects of transformational leadership on employee satisfaction and extra effort in educational contexts. Likewise, Boamah et al. (2018) found a direct link between transformational behaviors and both job satisfaction and quality outcomes in healthcare settings, reinforcing the cross-sectoral utility of this leadership model. Notably, subscales such as intellectual stimulation and inspirational motivation were the most influential components—aligning with Vila-Vázquez et al. (2018), who emphasized the importance of these traits in motivating educational professionals. Conversely, the study found laissez-faire leadership to have no significant impact, echoing earlier critiques (Skogstad et al., 2007) that associate this style with negative workplace outcomes such as low morale and performance. These findings reinforce the urgency for educational institutions to abandon passive leadership models and instead prioritize transformational practices that align with the demands of complex school environments.

However, the findings also diverge from some international studies. For example, Zhang et al. (2022) found that transactional leadership, particularly contingent reward, had a moderate positive impact on teacher job satisfaction in Chinese schools—a result only marginally supported in this study. Similarly, Luyten and Bazo (2019), in their research on Mozambican schools, noted that transactional leadership still played an important role in contexts with strong hierarchical cultures. The relatively weaker influence of transactional leadership in this study could be explained by the collectivist and relational nature of Mexican educational institutions, where emotional connection and shared values (hallmarks of transformational leadership) may be more impactful than reward-based interactions. Furthermore, while Bernal (2000) identified charisma and idealized influence as universal components of effective leadership, this study extends the model by highlighting psychological tolerance as a culturally resonant dimension of transformational leadership in Mexico. These points suggest the importance of contextualizing leadership theory and practice, and call for future research that explores how cultural and organizational variables mediate the effectiveness of different leadership styles in Latin America.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used [Chat GPT-4.0/ SERVICE] in order to [Translate, review and improve content]. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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