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Validating a leadership style scale in a military higher education institution: Implications for research and practice

Validación de una escala de estilos de liderazgo en una institución de educación superior militar: Implicaciones para la investigación y la práctica

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Abstract

This article presents a study to validate a scale to determine leadership styles in military higher education institutions in Ecuador. This study employed the scale validation methodology proposed by Sánchez and Echeverry (2004). The tests were conducted at the Ecuadorian Military Engineering School using an instrument proposed by Castro et al. (2007), which was adapted and administered to a non-random, purposive sample of 44 institution members. Validity and reliability tests were conducted. Content validity was assessed by a panel of experts, reaching a coefficient of 0.781, which is acceptable. Construct validity was conducted through exploratory factor analysis, which showed that each item was related to its dimensions. Criterion validity was performed by comparing correlations among the instrument's dimensions. Reliability tests using Cronbach's alpha showed values above 0.876 for the instrument and each item, indicating high internal consistency. It is concluded that the scale is valid and reliable for the studied variables and constructs, and it can be used in future research in the context of higher education in Ecuador.

Keywords: Leadership styles, Higher education, Measurement scale, Scale validation, Scale reliability, Ecuador.

Resumen

Este artículo describe un estudio cuyo objetivo es validar una escala para determinar los estilos de liderazgo en instituciones de educación superior militar en Ecuador. Este estudio siguió la metodología planteada por Sanchez y Echeverry (2004) para la validación de escalas. Las pruebas se realizaron en la Escuela de Ingeniería Militar de Ecuador, y se utilizó el instrumento propuesto por Castro et al. (2007), el mismo que fue adaptado y aplicado a una muestra intencional no aleatoria de 44 miembros de esta institución. Se realizaron pruebas de validez y de fiabilidad. La validez de contenido se realizó a través del juicio de expertos alcanzando un coeficiente de 0.781, lo que es aceptable. La validez de constructo se realizó mediante análisis factorial exploratorio en el que se identificó que cada uno de los ítems se relacionó con sus dimensiones. La validez de criterio se realizó a través de la comparación de las correlaciones entre las dimensiones de este instrumento. Las pruebas de confiabilidad de alfa de Cronbach, mostraron valores por encima de 0.876 tanto para el instrumento como para cada uno de los ítems, lo que indica una alta consistencia interna. Se concluye que la escala es válida y confiable para las variables y constructos estudiados, y puede ser utilizada en futuras investigaciones en el contexto de la educación superior en Ecuador.

Palabras clave: : Estilos de liderazgo, Educación superior, Escala de medición, Validación de escalas, Confiabilidad de escalas, Ecuador.

1. Introduction

Leadership plays a fundamental role in all areas of society, and military higher education is no exception. In this context, how leaders exert their influence can significantly impact the performance and well-being of individuals within an institution. A rigorous evaluation of the leadership styles employed is required to understand and enhance the effectiveness of leadership in this specific environment.

This article focuses on the validation of a leadership style scale adapted to the specific characteristics of a military higher education institution. A reliable and valid measurement tool to assess leadership styles in this context is essential for research and practice. By better understanding effective leadership styles and how they relate to organizational outcomes, military leaders can improve their leadership skills and make informed decisions to promote a healthy and productive work environment.

In the present study, a rigorous approach will be used to validate the leadership style scale in a military higher education institution. Data will be collected from a representative sample of military leaders and subordinates, using reliable and validated data collection methods. Additionally, statistical analyses will be conducted to evaluate the reliability and validity of the scale. Validation will be achieved through content validity, construct validity, and criterion validity, while reliability will be determined through Cronbach's alpha coefficient.

The findings of this study will have important implications for both research and practice. In terms of research, validating the leadership style scale in a military higher education institution will fill a gap in the existing literature and provide a solid foundation for future research on leadership in this context. As for practice, military leaders will be able to

use this scale to assess their leadership style and make necessary adjustments to enhance their effectiveness in mission fulfillment and personnel development.

In summary, this study aims to validate a leadership style scale in a military higher education institution, to provide military leaders with a reliable and valid tool to assess their leadership style and improve their effectiveness. The results of this research will have significant implications for research and practice in the field of military leadership.

2. Method

This research falls within the positivist paradigm, adopting a positivist approach, and has a descriptive scope as it aims to describe the validation of a leadership style scale in a specific military higher education institution. Its design is cross-sectional and followed the steps proposed by Sánchez and Echeverry (2004), as indicated in Figure 1.

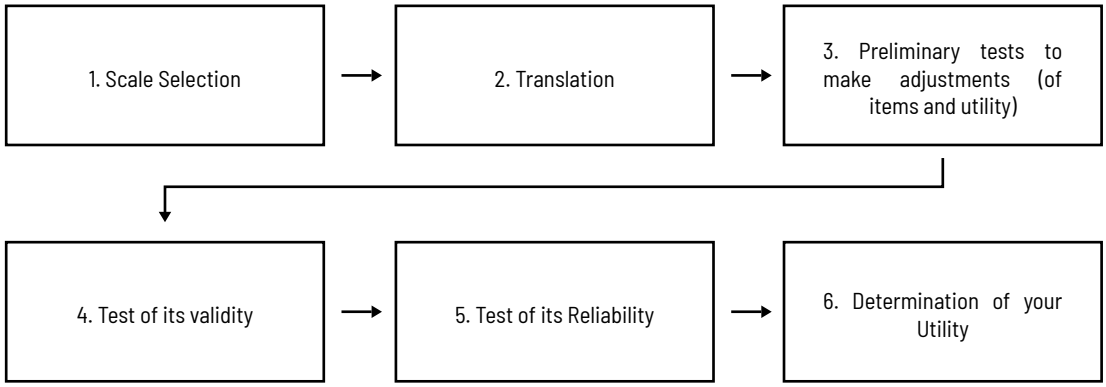

Figure 1: The validation process of the leadership styles scale of a military higher education institution is based on Sánchez and Echeverry (2004).

The first step, which corresponds to the scale selection, involved conducting a thorough review of the existing literature in this field, specifically on methods of assessing leadership styles and the instruments used for this purpose. This allowed for understanding the characteristics, elements, dimensions, and other relevant aspects of the scales employed in studying this variable. The scale based on the transformational leadership style, which includes transformational, transactional, and laissez-faire leadership styles proposed by Castro (2007), was selected.

The next step was the adaptation and translation of the scale. The scale was presented to the sample to be applied, and they were asked if the questions were understandable or if any changes or modifications were required. This helped determine that the scale was comprehensible within the cultural context it was going to be applied to, and since it was in Spanish, no modifications were needed.

Preliminary tests were then conducted to determine if any adjustments were necessary regarding item peculiarities, such as item comprehension, ambiguity, response frequency, and response range restriction. Regarding the utility of the scale, factors such as completion time, the need for training, format characteristics, and ease of scoring the final

score were identified.

For this purpose, the Military Engineering School: Gral. Guillermo Rodríguez Lara, located in the province of Santo Domingo de los Tsáchilas in Ecuador, was selected. This institution was chosen for its unique nature as a military educational institution dedicated to the training of military personnel for the Army, led by members of the institution.

The sample was non-probabilistic and intentionally selected for convenience, as members of the institution fulfilling functions within the institution were selected, while those who were outside the institution for various reasons were excluded due to the potential bias that may arise from not having a current perception of the institution's state. Thus, the sample consisted of 44 members of the institution. This may influence the representativeness and generalization of the results achieved in this study (Hernández et al., 2014).

Before data collection, an informed consent process was carried out, in which the purpose of the research was explained, confidentiality was guaranteed, and participants were asked for their authorization to be included in the study. Additionally, it was ensured that participation in the study was voluntary and that participants had the option to withdraw from the study at any time without negative consequences. Once the data was collected, a review was conducted, and incomplete or inconsistent responses were eliminated to ensure the quality of the obtained data.

Subsequently, content validity, construct validity, and criterion validity tests were conducted (Salinas and Cárdenas, 2009). Content validity was assessed through expert judgment and by calculating the content validity coefficient proposed by Hernández-Nieto (2002).

Construct validity involved an exploratory factor analysis to examine the underlying structure of the responses and determine if the questions grouped consistently with the theoretical dimensions of leadership styles. This allowed us to identify underlying factors and verify if they align with the theory. Criterion validity involved using statistical techniques, such as correlating the studied variable with an external variable, to compare the survey results.

Finally, a reliability analysis was conducted to assess the internal consistency of the scale. Cronbach's alpha coefficient was calculated to determine the reliability of the items, and test-retest analyses were performed using a sample of participants who completed the scale at two different time points (Oviedo and Campo, 2005).

In addition, opinions and comments were gathered from potential scale users, such as executives, faculty, and administrative staff. Their feedback was evaluated in terms of clarity, ease of administration, and relevance of the results for decision-making within the institution.

3. Results

Definition and Conceptualization of Leadership in the educational context:

Leadership is the ability of leaders to influence their followers through motivation, fostering teamwork, and improving interpersonal relationships to achieve the goals set within the organization (Yukl and Van Fleet, 1992). In this context, Gento (2002, cited by Rodríguez, 2016) states the following:

> "A leader is a person (or group of people) capable of unleashing, from within, the inner energy of other human beings so that they willingly strive to achieve, most effectively and comfortably possible, the goals that these human beings have set for themselves to achieve their dignity and that of those with whom they live in a specific environment and context to which they provide the necessary care" (p. 183).

According to Avolio and Yammarino (2013), leadership is defined as the process by which a person exerts social influence to achieve a common goal. These authors also highlight the importance of transformational leadership, which involves inspiring and motivating followers through the communication of a vision and the building of trust-based relationships.

Additionally, leadership can be conceptualized as a combination of skills, characteristics, and behaviors (Day et al., 2014). These aspects may vary depending on the context and situation, and a good leader must be capable of adapting and adjusting their leadership style to respond to the needs of the organization and followers (Kirkpatrick and Locke, 1991).

Leadership can be conceived from different approaches, and a leader can assume one or multiple leadership styles, which are different patterns of behavior developed during the process of influencing and directing workers (Stoner et al., 1996).

In the field of higher education, leadership is a process in which the leader exerts influence over a group of individuals, the followers, to achieve a common objective (Northouse, 2021). It plays a fundamental role in the success of the institution and the well-being of students, faculty, and administrative staff.

Several leadership approaches have been used in this context, each with its strengths and weaknesses. Some of the most common approaches include transformational leadership, transactional leadership, autocratic leadership, and others. In higher education, transformational leadership is an effective strategy for creating a motivating work environment and supporting the personal and professional growth and development of team members. However, each leadership approach has its advantages and disadvantages, and the effectiveness of a particular approach may depend on the context in which it is exercised.

Measurement of leadership styles in educational institutions: Studies of scale adaptation and validation

Measuring leadership styles in educational institutions is of great importance for improving the quality of education in Ecuador. In the field of leadership style measurement, various methods have been utilized, such as self-assessment and evaluation by subordinates or leadership experts.

Scales are common tools extensively employed in educational research to measure leadership styles. Two popular scales are the Multifactor Leadership Questionnaire (MLQ), which assesses transformational, transactional, and laissez-faire styles (Bass and Avolio, 1996), and the Leadership Practices Inventory (LPI), which measures five leadership practices (Watters, 2019; Díaz et al., 2020). Additionally, the School Leadership Profile Inventory (SLPI) is a scale used to evaluate the leadership styles of school principals across different

dimensions (Baviera et al., 2022). These scales have their advantages and limitations, as although they are standardized and objective tools, they may not capture the entirety of leadership style complexity.

Several studies have been conducted in this field in recent years, adapting and validating measurement instruments of leadership styles in different educational contexts in Ecuador. The study conducted by Díaz et al. (2020) analyzed the psychometric properties of an adapted version of the Multifactor Leadership Questionnaire (MLQ-5X) in the Spanish educational setting. The study involved 1551 high school students from 31 schools. A final model with 4 primary factors and 5 secondary factors was found, demonstrating validity and reliability. This version of the MLQ-5X can be used to assess teacher leadership from the perspective of students.

This study by Vega and Zavala (2004) focused on adapting the Multifactor Leadership Questionnaire (MLQ) to the Chilean cultural context. Various stages were carried out, such as translation, cross-cultural adaptation, and evaluation of the reliability and validity of the questionnaire. The results confirmed the item discrimination ability, high reliability, and construct validity of the instrument. These findings provide a solid foundation for future research and the development of training programs that promote effective leadership in Chilean organizations.

The study conducted by Castro et al. (2004) was based on Bass's theory (1985, 1990) and aimed to adapt the Multifactor Leadership Questionnaire (MLQ) to evaluate leadership styles in the Argentine civilian and military population. The sample consisted of 363 subjects, including civilians (53%), cadets, and military officers (47%). An exploratory and confirmatory factor analysis was conducted, resulting in a 34-item scale that fits a seven-factor model grouped into three leadership styles. The results indicated a better fit of the model for the civilian population compared to the military population. The scale measures transformational, transactional, and laissez-faire leadership styles.

The reviewed studies demonstrate that it is possible to adapt and validate measurement instruments of leadership styles in educational institutions in Ecuador, using recognized leadership theories and reliability and validity analyses.

Selection of the measuring instrument

The measurement instrument used in this research was the "CELID (Form S)", proposed by Castro et al. (2007), which consists of 34 items that assess three leadership styles: transformational, transactional, and laissez-faire. The items are measured on a five-point Likert scale, ranging from "strongly disagree" to "strongly agree." Annex A provides the leadership styles questionnaire (CELID - S) by Castro Solano et al. (2007), used for validation. This scale measures transformational, transactional, and laissez-faire leadership styles.

The transformational leadership style by Bass (1998, cited by Castro Solano et al., 2007) is defined as the ability of leaders to influence their followers (Hollander, 1978) through motivation, teamwork, and improvement of interpersonal relationships to achieve the goals set within an organization. It is evaluated based on sub-dimensions such as charisma, intellectual stimulation, inspiration, and individualized consideration (Table 1).

Table 1: Conceptual definition: Subdimensions of transformational leadership style.

Conceptual definition: Subdimensions of transformational leadership style	
Charisma	Leaders behave in such a way that they are taken as models by their followers, who want to imitate them. They enjoy renown, reputation, and trust. They show high levels of moral and ethical behavior.
Inspiration	Leaders inspire and excite their followers, and encourage esprit de Corps, and create expectations for the future.
Intellectual Stimulation	Leaders inspire their followers to possess innovative and creative ideas by generating new questions and formulating old issues in new terms. They do not criticize individual mistakes or ideas thatdiffer from those of the leader.
Individualized	Leaders show concern for individual needs and accept ideas that differ from their own.

Source. Own elaboration based on Castro Solano et al. (2007)

According to Castro Solano et al. (2007), the transactional leader is known to reward, or at the same time, to intervene negatively (sanctions) in the performance of his followers, either for being similar or not to what is desired. Followers are motivated by their interests and not by the influence of their leaders, as they seek to solve their intrinsic needs for the benefit of the organization. This leadership style can be identified through contingent reward and management by exception (Table 2).

Table 2: Conceptual definition: Subdimensions of transactional leadership style.

Definición conceptual: Subdimensiones del estilo de liderazgo transformacional	
Contingent reward	It refers to an interaction between leader and follower guided by the help of reciprocal exchanges. The leader identifies the needs of the followers and interacts between the desires of the institution and those of all. The leader rewards or punishes based on the achievement of objectives.
Handling by exception	The leader simply intervenes when it is essential to make corrections or changes in the followers' behavior. In general, the interventions are negative and critical so that the objectives do not deviate from their path.

Source. Own elaboration based on Castro Solano et al. (2007)

In addition, laissez-faire refers to the absence of leadership, as decisions are not made, actions are delayed and the leader's responsibilities are neglected, making this form of management useless. It is evaluated by considering leadership by passive exception.

Translation

Before administering the survey, an adaptation of the instruments was carried out, for which ESINGM personnel were selected to read the instruments and provide suggestions regarding adaptability. Language translation was not necessary as the instruments were in Spanish. Through this process, it was possible to identify that all the

questions were understandable in the applied context, and no issues were encountered. This was because the scale questions were formulated in a general manner and could be adapted to various domains.

Preliminary tests to make adjustments

The data collection procedure for validating the leadership styles measurement instrument in a military higher education institution involved administering the CELID questionnaire (Form S) to a randomly selected sample of 44 participants. Participants completed the questionnaire individually and online, using a secure and confidential digital platform. The majority of the sample was male (98%), while the remaining participants were female (2%). The average age of the participants was 38 years, with a standard deviation of 8.2 years.

Regarding the rank hierarchy, 4% of the participants were senior officers, 16% were junior officers, 20% were non-commissioned officers, and 60% were enlisted personnel. In terms of work experience, 30.8% of the participants had between 10 and 15 years of service, followed by 24.4% with 5 to 10 years of service, and 19.6% with 15 to 20 years of service.

The collected data were stored in an Excel database and subsequently processed using the SPSS 22 program. The items were scored as follows: SD= 1 point, D= 2 points, N= 3 points, A= 4 points, and SA= 5 points. During data collection, unanswered questions were encountered, so the surveys were returned to be completed. For unanswered questions, a value of three was assigned according to the instrument's instructions. The scores of the items corresponding to each dimension were then summed, and an average was obtained by dividing this sum by the number of items in each dimension. The results for the leadership styles were interpreted using Table 1, which establishes evaluation categories ranging from "Very low" to "Very high."

Table 3: Scale for interpreting leadership style results.

Evaluation	Value
Very low	1.0 - 1.80
Low	1.81 - 2.60
Medium	2.61 - 3.40
High	3.41 - 4.20
Very high	4.21 - 5.00

Regarding the transformational leadership dimension, charisma was identified as the indicator with the highest score, followed by the indicators of individualized consideration and intellectual stimulation, perceived as very high, and the indicator of inspiration is perceived as high. Transformational leadership perceived from these indicators is very high (Figure 2).

Value	Mena	Median	Mode	Variance	Range	Minimum	Maximum
	4,4659 4,2338 4,3106 4,3226	5 5 4 4	5 5 5 5	0,304 0,444 0,395 0,343	1,75 2,86 2 2,21	3,25 2,14 3 2,79	5 5 5 5
Charisma	4,4659	5	5	0,304	1,75	3,25	5
Intellectual stimulation	4,2338	5	5	0,444	2,86	2,14	5
Inspiration	4,2803	4	5	0,84126	0,708	1	4
Individualized	4,3106	4	5	0,395	2	3	5
Transformational leadership	4,3226	4	5	0,343	2,21	2,79	5

Figure 2: Transformational leadership dimension N=44

Regarding the transactional leadership dimension, it was identified that in ESINGM this leadership is perceived in a higher percentage through contingent reward, followed by direction by exception, being perceived in a medium range (Figure 3).

Value	Mena	Median	Mode	Variance	Range	Minimum	Maximum
	3,3636 2,9091 3,1364	4 3 3	4 4 4	0,763 0,728 0,533	4 3,83 3,17	1 1,17 1,67	5 5 4,83
Contingent reward	3,3636	4	4	0,763	4	1	5
Management by exception	2,9091	3	4	0,728	3,83	1,17	5
Transsactional leadership	3,1364	3	4	0,533	3,17	1,67	4,83

Figure 3: Transactional leadership dimension N=44

Regarding the laissez-faire dimension in ESINGM managers, it is observed that it is perceived in a minimum percentage since the instructors have a low perception of this leadership style (Figure 4).

Value	Mena	Median	Mode	Variance	Range	Minimum	Maximum
	2,197	2	1	0,852	3,67	1	4,57
Laissez Faire	2,197	2	1	0,852	3,67	1	4,67

Figure 4: Laissez faire dimension N=44

In conclusion, according to the perception that ESINGM instructors have, it can be determined that the predominant leader in the institution is transformational leadership with a mean of 4.3226, followed by transactional leadership traits of 3.1364, and with a low laissez-faire style of 2.1970 (Figure 5).

Value	4,3226 3,1364 2,197	4 3 2	5 4 2	0,763 0,728 0,533	4 3,83 3,17	1 1,17 1,67	5 5 4,83
	Mena	**Median**	**Mode**	**Variance**	**Range**	**Minimum**	**Maximum**
Transformational leadership	4,3226	4	5	0,343	2,21	2,79	5
Transformational leadership	3,1364	3	4	0,533	3,17	1,67	4,83
Laissez Faire	2,197	2	1	0,852	3,67	1	4,67

Figure 5: Dimensions of leadership N=44

Tests of its validity

Validity Analysis performed in this study included the assessment of content validity, construct validity, and criterion validity of the leadership styles measurement instrument in a military higher education institution.

Content validity was evaluated by a group of experts in the field of leadership and military to ensure that the instrument's content was appropriate and relevant to the studied population. Based on Hernández-Nieto (2002), three experts were selected and provided with the leadership styles measurement questionnaire to assess the relevance, conceptual clarity, wording and terminology, correct response, appropriate distractors, difficulty levels, and format using a Likert-type scale with the following levels: unacceptable (1), deficient (2), regular (3), good (4), and excellent (5). The results were processed to obtain the Content Validity coefficient, which reached a value of 0.781, representing an acceptable coefficient of validity and agreement. Therefore, this evaluation instrument can now be relied upon within the educational field.

Construct validity was assessed through exploratory and confirmatory factor analysis. Exploratory factor analysis demonstrated that the measurement instrument of leadership styles in a military higher education institution had a clear and coherent factor structure, indicating that it validly measures different leadership styles (Figure 6).

Prueba de KMO y Bartlett		
Medida Kaiser-Meyer-Olkin de adecuación de muestreo		,851
Prueba de esfericidad de Bartlett	Aprox. Chi-cuadrado	622,919
	gl	136
	Sig.	,000

Prueba de KMO y Bartlett		
Medida Kaiser-Meyer-Olkin de adecuación de muestreo		,651
Prueba de esfericidad de Bartlett	Aprox. Chi-cuadrado	161,554
	gl	55
	Sig.	,000

Prueba de KMO y Bartlett		
Medida Kaiser-Meyer-Olkin de adecuación de muestreo		,762
Prueba de esfericidad de Bartlett	Aprox. Chi-cuadrado	84,436
	gl	15
	Sig.	,000

Matriz de componente rotado[a]				
	Componente			
	1	2	3	4
Item 22	,864			
Item 23	,796			
Item 24	,762	,421		
Item 29	,752	,418		
Item 19	,736	,436		,384
Item 25	,701		,529	
Item 21	,563		,463	,378
Item 30	,354	,853		
Item 15		.835		
Item 33	,377	,651	,430	
Item 34	,386	,593	,524	
Item 17	,382		,758	
Item 14			,685	
Item 13	,380		,666	
Item 3				,903
Item 28	,478			,703

Matriz de componente rotado[a]			
	Componente		
	1	2	3
Item 5	,829		
Item 7	,748		
Item 9	,635	,515	
Item 2	,628		,464
Item 8	,579	,568	
Item 12		,786	
Item 11	,354	,738	
Item 10		,620	
Item 26			,831
Item 18	,398		,678
Item 16		,393	,426

Método de extracción: análisis de componentes principales.

Matriz de componente[a]	
	Componente
	1
Item 1	,820
Item 32	,793
Item 20	,755
Item 6	,744
Item 31	,642
Item 27	,535

Método de extracción: análisis de componentes principales.

a. 1 componentes extraídos.

Figure 6: Rotated component matrices of the dimensions of the leadership styles scale.

Regarding convergent validity, high and significant factor loadings were observed in the components corresponding to the dimensions of transformational leadership. The items associated with each sub-dimension showed high loadings on their respective components, indicating a positive relationship between the items and their respective sub-dimensions.

In terms of discriminant validity, the rotated component matrices showed a structure where the items clustered within the components corresponding to their specific dimensions. Items from each dimension tended to load more strongly on their component and displayed relatively low loadings on other components, indicating appropriate discrimination among the scale's dimensions.

Regarding the concurrent criterion validity of the leadership scale, consistent correlations were observed among the dimensions related to different leadership styles (Figure 7). The positive correlation between transformational leadership and transactional

leadership suggests an association between both leadership approaches, while the negative correlation between transformational leadership and laissez-faire style indicates an opposite relationship between them.

			Liderazgo_ transforma-cional	Liderazgo_ transaccional	Laissez_ Faire
Rho de Spearman	Liderazgo_ transformacional	Coeficiente de correlación	1,000	,164	-,418**
		Sig. (bilateral)		,286	,005
		N	44	44	44
	Liderazgo_ transformacional	Coeficiente de correlación	,164	1,000	,553**
		Sig. (bilateral)	,286		,000
		N	44	44	44
	Laissez_Faire	Coeficiente de correlación	-,418**	,553**	1,000
		Sig. (bilateral)	,005	,000	
		N	44	44	44

**. La correlación es significativa en el nivel 0,01 (2 colas)

Figure 7: Correlations among the dimensions of the leadership styles scale.

Overall, the results of the validity analysis suggest that the measurement instrument for leadership styles in a military higher education institution is a valid and reliable tool for assessing different leadership styles in the studied population.

Reliability analysis

The reliability analysis of the leadership styles measurement instrument CELID (Form S) was conducted by calculating Cronbach's Alpha coefficient. Bach's Alpha coefficient measures the internal consistency of items in a scale and is considered an indicator of instrument reliability. Specifically, the Cronbach's Alpha coefficient for the instrument was 0.876, indicating high internal consistency as it surpasses the recommended minimum value of 0.7 (Table 4). Moreover, the Cronbach's Alpha coefficients for each item were greater than 0.868, suggesting adequate internal consistency for each of them (Appendix B).

Table 4: Reliability statistics N=44

Cronbach's alpha	N of elements
0,876	34

The obtained results indicate high internal consistency for the instrument and its items, suggesting that the instrument is reliable and the items measure what they are supposed to measure.

Determination of its utility

The results confirm the reliability and validity of the instrument, which can be used to measure the leadership styles of military leaders in this type of institution. The CELID (Form S) instrument was adapted and modified for use in the military higher education institution where the research was conducted to align it with the specific characteristics of the sample and the organizational culture of the institution. Additionally, a content validation of the instrument was performed with experts in the field, and a pilot test was conducted with a group of participants to assess the clarity and understanding of the items.

The measurement instrument used in this research is considered valid and reliable, as Cronbach's Alpha coefficients above 0.876 were obtained for both the overall instrument and individual items. Moreover, significant correlations were observed between the leadership styles measured by the instrument and variables related to the participants' job satisfaction and job performance.

This instrument is a useful tool for research in the field of military leadership as it allows for the measurement of the leadership styles of military leaders and their relationship with various variables, such as organizational performance, subordinate satisfaction, and leadership effectiveness in decision-making.

Furthermore, this instrument can also be utilized in practice, enabling military leaders to identify their strengths and weaknesses in terms of leadership style and adjust their leadership accordingly. This, in turn, is expected to improve organizational performance and achieve strategic objectives.

It is important to note that the validation of this instrument in a military higher education institution may have implications in other military and non-military contexts. Therefore, its application in different contexts is recommended to confirm its validity and reliability.

In summary, the validation of this leadership style measurement instrument in a military higher education institution represents a significant contribution to the field of leadership and management in military organizations and may have implications in other contexts. It is expected that this instrument will be used in future research and in practice to enhance leadership and organizational performance.

4. Conclusions

The validation of the leadership styles scale for military higher education institutions followed the methodology proposed by Sanchez and Echeverry (2004). The leadership assessment instrument CELID (Form S) proposed by Castro et al. (2007) was selected based on a thorough review of the literature. Additionally, this scale was adapted to the context of higher education institutions, with a sample of 44 members from the Military Engineering School.

Preliminary tests allowed for determining the level of item comprehension, ambiguity, response frequency, response range restriction, required completion and administration time, training needs, instrument format characteristics, and ease of scoring the final scale score. The predominant leadership style in the evaluated military institution

is transformational leadership, perceived as very high. On the other hand, the transactional leadership style and its dimensions were perceived in a moderate range. Finally, the laissez-faire leadership style was perceived as low, with few traits of this leadership style identified by the instructors.

The scale was validated using content validity through the judgment of three military experts involved in military higher education, reaching a coefficient of 0.781, which is acceptable. Additionally, construct validity was employed through exploratory factor analysis, and it was identified that the items are related to each of the scale dimensions. Regarding criterion validity, it was found that the dimensions of the scale correlate with each other, both positively and negatively.

The leadership assessment instrument CELID (Form S) proposed by Castro et al. (2007) demonstrated high reliability in this study. The obtained Cronbach's Alpha reliability coefficients, both for the overall instrument and for each item, surpassed the value of 0.876. These results indicate that the instrument exhibits strong and reliable internal consistency.

These results suggest that the CELID (Form S) instrument is valid and reliable for measuring leadership styles in a military higher education institution. In conclusion, this provides researchers and professionals in military higher education with a useful tool to assess leadership styles in their institutions and serves as a guide for future researchers wishing to design and validate leadership style measurement instruments in other educational contexts in the country.

5. References

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