

Determinants of legal competencies in Colombian school administrators: a multivariate analysis

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Abstract: Based on multivariate analysis, this quantitative research examines the predictors of legal competencies of educational directors in Colombia. Legal competencies are an essential and relatively underexplored aspect of educational leadership, and in the context of Latin America various legal practices are underdeveloped in many countries. A 23-item Likert scale of legal competency was applied to 52 Colombian educational directors sampled from Colombian institutions through a cross-sectional survey design. For the perceived legal competencies (see Descriptive Table 1), the grand mean was 3.647 (SD = 1.144), with moderate to high deviations between items. Using inferential analysis, also significant underlying construct correlations between items (mean $r = 0.424$) were identified. Five factors accounted for 76.8% of overall variance (KMO = 0.804, Bartlett's $\chi^2 = 1061.48$, $p < 0.001$): knowledge and application of regulations (24.9%), institutional compliance (22.1%), strategic legal management (13.1%), procedural competence (9.5%), and crisis legal response (7.1%). Regarding the multivariate outcome analysis, it was found that the multivariate regression model showed strong prediction validity ($R^2 = 0.999$, adjusted $R^2 = 0.999$), and regulatory knowledge ($\beta = 0.643$) and institutional compliance ($\beta = 0.298$) were the main factors predicting the overall legal competence. Cross-validation of the model provided extra confidence in model robustness, achieving an average R^2 of 0.998. These findings point to the multidimensional aspect of legal competencies and areas for educational leaders for professional development. Policy, leadership, and competency,

based selection system implications are analyzed in Colombian and wider Latin American educational governance settings.

Keywords: Legal competencies, educational directors, multivariate analysis, educational leadership, regulatory knowledge.

Introduction

The 21st century educational leadership requires a new and more sophisticated set of skills that extends beyond pedagogical and administrative skills. Among these, the development of legal skills such as instruction, legal representation, due process, and legal interpretation has been recognized as necessary but still neglected aspects of school governance (Babenko, 2023; Hughes, 2023). In Latin America (and especially in Colombia), educational directors work within a complex legal ecosystem that encompasses matters such as student rights, teacher contracts, institutional accountability, and community relations (Neira et al., 2025; Pérez et al., 2021). Notwithstanding this reality, such systematic empirical investigation of legal competencies of Colombian educational directors is limited. The Colombian educational system has undergone a transformation in the last two decades with the introduction of new regulations and accountability systems, imposing an unprecedented legal burden on school leaders (González et al., 2022).

Education directors are required to grapple with the complex legislation, such as Law 115 of 1994 (General Education Law), Decree 1075 of 2015 (Single Regulatory Decree for the Education Sector), and extensive ministerial resolutions governing institutional functions (Santos et al., 2025). However, the current selection and training paradigm seems to be biased towards teaching pedagogy at present rather than legal literacy; potentially leaving directors not adequately prepared for some of the legal elements of their positions (Romero et al., 2023; Tróchez, 2023). This study reveals the consequences of such inadequately constructed legal competencies on school personnel; including litigation, fines from regulators, infringement of students' rights, and reduced efficiency of schools internationally (Casale et al., 2024; González et al., 2025).

The formation of the Superintendence of Education in Chile has greatly expanded the juridification regime and has influenced the professional practices of principals, indicating the relevance of legal literacy for educational leadership (González et al., 2025). Such trends are observed in Latin America too, whereby educational policies were increasingly considering legal accountability and compliance (Luna et al., 2024; Pertuz et al., 2024). Despite recognition of the importance of legal proficiency, there are also various gaps in literature. First, most studies of educational leadership competencies focus on pedagogical, managerial or transformational dimensions, while legal competencies receive no relevant attention (Bergeron et al., 2023; Vega-Armas et al., 2024). Second, the few publications which investigate legal competencies are qualitative or descriptive (and not quantitative) methodologies which may identify the underlying factor structure and the predictive relationship (Souza et al., 2023). Third, the Colombian context remains largely underreported in international research on educational leadership competencies, even as Colombian regulatory environment is highly specific and educational development is under continuous efforts (Luna et al., 2024).

The study by this review aims to fill such gaps by systematically conducting quantitative research on legal competences of Colombian educational directors. In particular, the aims of the study that is conducted in this research are as follows: 1) To establish the current evidence of law-and-related competency of Colombian education directors in several dimensions, 2) to identify the structural foundation of the legal competencies through factor analysis, 3) to build and validate the multivariate predictor model of general proficiency in law, 4) to provide evidence-based policy advice for modification and training.

The survey is cross-sectional and involves 52 educational directors from Colombian institutions who were also teachers and who were part of the educational leadership intervention; they took part by using a 23-item Likert scale questionnaire developed as a research instrument to consider qualification in practice for legal competences relevant to educational leadership. Descriptive statistics, correlation analyses, exploratory factor analysis (EFA), multivariate regression modeling, among other

data analysis techniques are used. The approach enables the identification of latent dimensions of competence and the relative impact of these dimensions on general legal ability. Relevance to different stakeholders: there are many ways this findings could be relevant to various stakeholders. Policymakers could use the insights to guide reforms to director selection processes, certification requirements and accountability mechanisms. The factor structure serves as a guideline for individual training programs and programs for educational institutions and professional development providers as a framework.

As for directors of education themselves, this research provides an understanding of the key competency areas that need attention to become better professionals. Furthermore, more generally, the study builds on a burgeoning international literature about educational leadership competences and targets issues peculiar to the educational systems of Latin America. This article is organized as follows. In Section 2 the literature on legal competencies in educational leadership, competency frameworks for school administrators, and the Colombian educational context is reviewed. In Section 3, research methodology including design, sample, instrumentation and analytical procedures are described. The descriptive, inferential, factor analytic and regression analyses are provided in Section 4. Findings in Section 5 are considered alongside literature, theoretical models and practical implications. Policy, practice, future research recommendations are presented in Section 6.

Literature Review and Theoretical Framework

Legal Competencies in Educational Leadership

Legal aspects of educational leadership include knowledge, skills, attitudes, and behaviors required by school administrators to navigate through complex regulatory environments and comply with regulatory agencies in a responsible manner, maintain institutional compliance, safeguard stakeholder rights and avoid unlawful action (Babenko, 2023; Hughes, 2023). These competencies go well beyond knowledge of educational law as a practice skill and also consist of skills to apply legislation, ethical judgements, and strategies to reconcile legal obligations with educational mission (Mašát, 2023).

Legal literacy is increasingly viewed in recent scholarship as a key aspect of effective educational leadership. Hughes (2023) discovered that the majority of school administrators wanted to do situation-specific instruction on real-world legal literacy and only 10% of school administrators reported receiving such a workshop. The gap between need and provision is a significant concern as legal challenges for educational institutions such as special education compliance, student discipline, employment law, and community relations are increasing (Casale et al., 2024). The study by Casale et al. (2024) shows professional training programs are grossly inadequate, with only 3-13% of the articles in general school administration textbooks covering critical special education legal concepts compared to 63-84% of articles found in specialized textbooks.

Legal competence as a concept in education management is theorized by Babenko (2023) on the basis of practical use of case studies and practical application in the field. Under this view you can't learn law by being exposed to a legal system; to learn about law you need to practice it like real administrative issues. According to Mašát (2023), it would make sense to regard legal ability as a structural ingredient of (not just a measure of) the broader educational system and to optimize norms surrounding legality while also increasing the level of transparency of course programs. Due to complexity and fragmentation of regulation in the Latin American context, legal competence becomes especially necessary. Pérez et al. (2021) raised serious legal gaps between institutions, in Colombian educational institutions with regard to use and understanding of school coexistence manuals. Their findings brought to light major gaps in the existing knowledge of due process, right to defense, and presumption of innocence in educational policy that lead not only to lapses on the regulatory and governmental policy application side but also to legal gaps that impede policy implementation. This is a testament to the real-life effects of inadequate legal literacy as it is practiced by educational leaders.

The juridification of educational administration, the growing dominance of legal logic and procedures on educational management with regard to school management, is a major global trend of

educational leadership. González et al. (2025) tracked a decade of Chile's Superintendence of Education and explained how new juridifying practices have transformed the professionalism of principals. Consequently, with each additional administrative bureaucracy, more complicated methods of conflict management are introduced, and focus on legality versus education has come to be put in front of practical requirements. Principals confronted difficulties in managing agreements with families who increasingly move the issues to regulatory authorities, weakening administrators' conflict management autonomy and risk avoidance abilities.

Legal competencies exist adjacent to a complex set of leadership dimensions, such as ethical decision-making, stakeholder communication, crisis management, and strategic planning (Bergeron et al., 2023; Burai et al., 2023). Burai et al. (2023) found that Croatian principals expressed lowest satisfaction with proficiency in crisis management and strategic management—areas strongly influenced by the law. Since 2021, Croatian principals' duties and freedoms have developed into formal law and standards of business occupation by legal authorities, underlining the fact that legal literacy has now become a central requirement for professional practice all over Croatia.

Competency Frameworks for School Administrators

Competency-based approaches to educational leadership have gained recognition worldwide, where various countries and organizations have developed guidance systems to help administrators choose, evaluate, and develop professionals according to their own needs (Cabrera, 2022; Ramírez, n.d.). These frameworks generally cover several distinct competency domains, though their concrete dimension and relative importance vary depending on context. In Latin America, a number of countries have established official competency frameworks in terms of educational administrators' skill set development.

Chile's model prioritizes merit-based access, transparency, and credentialing requirements and requires that principals hold teaching qualifications, have at least three years of working classroom background, and demonstrate five years in school management roles (Cabrera, 2022). The Chilean selection process involves independent qualifying commissions that conduct the process to ensure that decision-making is academically based and respects the educational goals of the institution. However, Luna et al. (2024) observe that, while Chile, Argentina, Mexico, and Peru all have policies for promoting school leadership by professionalizing teachers and designing innovative policies, it is not the case in Colombia.

The lack of comprehensive competency frameworks in Colombia has also been detected as a considerable void. According to Tróchez (2023), Colombian educational directors who served in Rosas municipality could be found to face management-related deficiencies which are characterized by limited assertive communication, a short tenure at the institution, and a lack of collaborative settings for joint interests. As directors tried to lead effectively, without some type of formal competency development project to back their advice, their actions were too difficult. Similarly, Romero et al. (2023) also noted that Colombian entry requirements for directors are based on knowledge instead of proven competencies relating to leadership, which neglects the fact that having regulatory knowledge does not always lead to good leadership practice.

The growing importance of legal literacy across international competency frameworks, although the adoption of this approach varies from country to country. Bergeron et al. (2023) has highlighted a central issue in defining generic competencies of educational directors in the legal context, in practice this challenge is pronounced in emerging countries. Based on the aforementioned principles, they underline the importance of establishing the legal status of educational directors and defined roles (particularly in pedagogical terms, to foster effective leadership and accountability thereof). Souza et al. (2023) examined Brazilian States and Capital Municipalities' regulation on school director competencies indicating that with the majority of states having passed legislation governing the director function, only very few jurisdictions use the term "competencies" overtly. Rather, competencies are inferred from words such as "competer ao diretor escolar" (the director is accountable) with legal elements such as adherence to legislation and expansion of complementary standards becoming prevalent. However, when constructing competency frameworks, one must strike a balance

between standardization and adaptation to context. Neira et al. (2025) investigated rural education in Colombia, showing how modifying local realities and quality policies influence the management of schools.

Resources available for rural educational leaders directly influence their work and the participation of communities in school management becomes especially important. That means that competency frameworks must be adaptable enough for various institutional environments to maintain the same foundational standards; otherwise, they won't be effective. Training courses based on competency frameworks can facilitate a superior administrator effectiveness. Borges et al. (2024), looking into the positive impact of a formalized professional development program for principals on school management practice in Brazil, found that formalized training was able to improve management skills. Similarly, Bayona-Rodríguez et al. (2025) in Colombia examined the effectiveness of the "Rectores Líderes Transformadores" (RLT) program and the school leader specific competencies, evaluating the possibility of receiving systematically developed school leaders competencies through targeted interventions.

The Colombian Educational Context

Colombia's education system operates under a legal and administrative framework of constitutional provisions, national law, ministerial decrees, and local regulations (Santos et al., 2025). Education being a basic human right in 1991, the 1991 Constitution outlines basic principles of education governance, including decentralization, community participation, and quality assurance. Since then, some laws have enhanced the extent of clarifications regarding the regulatory requirements pertaining to the operation of institutions, particularly the Law 115 of 1994 (General Education Law) and Decree 1075 of 2015 (Single Regulatory Decree for the Education Sector).

Colombian educational directors, or directors of education — "directivos docentes" — have a unique role within this system. Directivos docentes are not only administrative persons, but are also required to offer pedagogical leadership, taking on broad administrative, legal as well as managerial responsibilities (González, Elzquez, & Tróchez, 2022; Tróchez, 2023). This dual role presents especially distinct challenges; directors are expected to balance educational mission and regulatory alignment with inadequate preparation to negotiate the legal realities of their roles.

There has been a great deal of ongoing controversy and reform over who and what should be educational directors in Colombia. Romero et al. (2023) states: "In entering education, professionals nowadays need a broad professional education credentials (today across all disciplinary areas of education) plus completion of all written examinations that are deemed essential to entry, yet this doesn't systematically consider leadership skills or legal literacy." This simply represents a knowledge-only perspective, when in fact educational leadership must concentrate on real skill or practical skills, not only the literary capabilities (this is not also determined by written tests).

Colombian educational directors reveal substantial variability on managerial/legal competencies in their research findings. This systematic underestimation of leadership and legal competence, especially across education levels, is mirrored in trends in the current landscape of education. Tróchez (2023) documented that directors in Rosas municipality had limited assertive communication, short institutional tenure, and absence of interdisciplinary partnerships—all these factors led to less educational and legal effectiveness, and limited effectiveness of the institutions which contribute to loss to both educational and legal processes. The study suggested the establishment of a more comprehensive management skills training program to rectify the deficiencies. Similarly, González et al. (2022) found educational director quality to be an essential need for improving the quality of Colombia's national education system, which was also seen as a focus of renewed interest between 2018-2022 due to government interventions and pandemic-related challenges.

For Colombian educational directors, school coexistence is also a hot-button issue. Pérez et al. (2021) explored the legal foundations of school coexistence in relation to coexistence manuals that existed in the schools of the Sogamoso, Boyacá area. They found significant deficiencies in legal competencies. Institutions showed limited knowledge of due process, right to defense, and presumption of innocence in terms of aggression matters. Because of these inadequacies, this

contributed to regulations being applied. Consequently to these deficiencies, this helped to apply regulations wrongfully and stripped legality, thus hampering the introduction of the coexistence policies. To fill these gaps, the researchers recommended legal advisory services and educators' training.

Wider barriers for educational management in Colombia mirror wider systemic failings and the inability for directors to create the changes. Misad et al. (2022) observed that directors in Latin America (in the case of Colombia even more so) are transitioning from only administrative to pedagogical management and are required socioemotional competences to develop a horizontal relationship with collaborators and communities. Success with school climate mandates educational management that enables norms to be enacted with a certain amount of rationality and quality of education.

The rural educational community in Colombia is even more complex. Neira et al. (2025) in their research, pointed out that quality policies should be locally responsive to its context and are affected by quality in accordance to that context and in light of its resources which includes those resources for rural educational leaders to leverage in rural educational practices also directly in direct and locally informed areas that feed into their work in the nation in their study. Community involvement in school management in rural contexts is often an exercise in making directors navigate the difficult waters of legal mandate, community expectation, and resource constraints.

The legal framework of rural education must strike a balance between standardization and flexibility in order for it also to adjust for the different conditions within these nations. But a comparison of Colombia to its siblings in Latin America indicates that Colombia lacks systematic policies for breeding educational leaders. Luna et al. (2024) stated, "Although Chile, Argentina, Mexico, and Peru possess the policies to promote school management through teacher professionalization and new leadership strategies, Colombia has no formal mechanisms to enact these." This space suggests that for more comprehensive policy reform of educational and pedagogical leadership, and indeed important supporting competencies like legal literacy, is not simply a need. A few programs in the last few years offer some hope on how to fill the competency gaps in Colombian education directors. The "Rectores Líderes Transformadores" (RLT) program proposed by Bayona-Rodríguez et al. (2025) is intended as well as promoting the systematic development of school leader capabilities with structured professional development. Yet how specific these programs are to legal competencies is poorly understood, and little application compares to a full school of educational directors does exist.

Gaps in Current Research

While there is increasing appreciation of legal competencies that serve as the basis behind educational leadership, much progress remains to be made in this regard. First, the evidence is predominantly qualitative and descriptive and as useful as it is to understand experiences and perceptual features it is not a reflection of the determining mechanism supporting factor structure nor to predict future associations (Carolino et al., 2023; Santos et al., 2023). Yet less quantitative work to date has been done by advanced statistical techniques, including factor analysis and multivariate modeling, particularly in Latin American settings.

Second, the Colombian context remains widely underrepresented in cross-cultural studies of educational leadership competencies. Although studies from Chile, Brazil, and other Latin American countries generate useful evidence, Colombia's specific regulatory landscape, reforms in education, and sociopolitical context merit careful exploration (Luna et al., 2024; Pertuz et al., 2024). Although research on Colombian educational directors is limited to nonacademic contexts, these studies tend to be limited to the domains in general managerial competencies or transformational leadership rather than legal literacy (González et al., 2022; Tróchez, 2023).

Third, the current frameworks of educational administrators' competency tend to consider legal competencies as a single domain, undifferentiated, rather than investigating their multifaceted architecture (Bergeron et al., 2023; Souza et al., 2023). We need to know what the dimensions of legal competency are, for example, regulatory knowledge, compliance procedures, due process, crisis legal response, and strategic legal management to develop tools and interventions that specifically target these competencies.

Fourth, the interrelationship among dimensions of legal competency and administrative effectiveness has not been well characterized. Whereas some studies recognize the limited levels of legal literacy (Casale et al., 2024; Pérez et al., 2021), little is known and the research highlights what dimensions of competence are critical for any educational leader. There is a striking lack of multimodal approaches that allow us to determine the interrelationship of competency factors. Most research on educational director competencies has either initial preparation or a more general professional development focus, without a focus on actual competency profiles of practicing administrators (Carolino et al., 2023; Loor et al., 2025).

Knowing how current the legal competencies are of current active educational directors can help create appropriate and effective interventions. This study fills these gaps with an in-depth quantitative study of legal competencies of Colombian education directors, carried out an exploratory factor analysis to identify its roots and a multivariate regression approach to establish predictive relationships. With emphasis on this Colombian context combined with rigorous methodological methodology, the study presents theoretical contributions on national policies to the international literature on educational leadership skills.

Methodology

Research Design

In this study, a cross-sectional quantitative survey was used to explore the legal competencies of educational directors in Colombia. Cross-sectional design was adopted to capture a snapshot of current competency in a diverse sample of administrators for the purpose of identifying patterns, associations, and underlying factor structures (Creswell & Creswell, 2018). The research study employed four supplementary analytical methods: (1) descriptive statistics for showing distribution and central tendencies for legal competency indicators; (2) inferential statistics for exploring relationships among competency dimensions; (3) EFA for examining latent factor structures; and (4) multivariate regression modeling for analyzing the predictive relationships between competency factors and overall legal competency. Due to the research challenges related to identifying the latent constructs of competency and constructing a predictive model – that need statistical methods that qualitative methodologies lack (Field, 2018) – the quantitative method is deemed appropriate for these factors. Although qualitative research could afford more nuanced understanding of the contextual conditions under which educational directors experience and negotiate legal difficulties, the present study also aimed to develop the structural and predictive groundwork needed for subsequent intervention formulation and monitoring.

Sample and Participants

The sample for the study was 52 educational directors (directivos docentes) of Colombian educational institutions. We recruited participants based on purposive sampling and criteria in relation to level of educational administrative experience, which includes the need of knowing as much as possible about the legal aspects of educational leadership. This sample consisted of directors of different institutional contexts, including urban, rural, public and private settings, and various levels (primary, secondary and combined).

Concerns regarding sample size weighed statistical power requirements against practical constraints. For exploratory factor analysis, this sample size of 52 participants indicates a subject to variable ratio of around 2.3:1 (52 participants / 23 items), less than the recommended minimum of 5:1 but appropriate for exploratory research, as items that demonstrate significant communalities and manifest distinct factor structures (Costello & Osborne, 2005). Kaiser-Meyer-Olkin (KMO) measure of adequacy of sample (0.804) demonstrated that sample size is adequate for factor analysis, being larger than the 0.80 threshold of “meritorious” adequacy (Kaiser, 1974). Diversity in participant demographics echoed the variety of levels of Colombian educational leadership. Directors represented not only different parts of Colombia, but institutions of different sizes and with different socioeconomic settings. This diversity contributes to the generalizability of findings to the population of Colombian educational directors, although the representativeness of the present research is acknowledged and discussed in

Section 5.4.

Instrumentation

Data were collected using a 23-item Likert-scale questionnaire developed to measure legal competencies in educational administration. The instrument was created in response to the following steps: (1) systematic literature review to identify the most relevant aspects of legal competence in educational leadership; (2) consultation with legal experts in the field of educational law and with experienced administrators at the administrative level for content validity; (3) pilot testing with a small sample of directors to refine item wording and options for response; and (4) final revising as per pilot feedback. The self-report questionnaire used the 5-point Likert scale from 1 (minimum competency/strongly disagree) up to 5 (maximum competency/strongly agree). Questions evaluated several dimensions of legal competence:

Knowledge of educational legislation and regulatory frameworks.

Ability to interpret and apply legal norms in institutional contexts.

Understanding of due process and stakeholder rights.

Competence in legal compliance and documentation.

Capacity to manage legal conflicts and crises.

Strategic integration of legal considerations into institutional planning.

Ethical application of legal principles in decision-making.

These 23 items were used in different conceptual domains and were distributed evenly but the specific factor structure and model were generated empirically through an exploratory factor analysis rather than via a priori imposed measurement. Such an approach enabled insights into latent dimensions that may not exactly correspond to theory, thereby increasing the ecological validity of the results. Reliability of the instrument was tested by internal consistency analyses. Cronbach's alpha was 0.89 for the entire 23-item scale, which indicated good internal consistency (Nunnally & Bernstein, 1994). In each item total correlations varied from 0.42 to 0.78, with all items above the minimum 0.30 point value for retention. These psychometric properties contribute to the instrument's suitability to measure legal competencies in Colombian educational directors.

Data Collection Procedures

Data collection took place throughout August–October 2025 using an online and in-person survey administration. Educational directors were contacted via professional networks, educational associations, and direct institutional outreach. Participation was voluntary and all participants gave informed consent to participate in the study after being informed about the study purpose, procedures, data confidentiality protections, and their option to withdraw from the study at any time. The survey was administered via a secure online platform which guaranteed data privacy and permitted the respondents to fill in the questionnaire conveniently. For those who did not have access to computers or wanted to participate in person, only a paper-based survey was provided and then it was entered into an electronic database. Data quality checks were carried out to catch and remedy any missing parts of data, all outliers as well as the result of responses displaying insufficient engagement (e.g., straight-lining). Response rate was around 68%, as estimated based on the proportion of contacted directors that responded to the survey. Non-response analysis comparing respondents early and late in key demographics revealed no significant differences with low or no non-response bias (Armstrong & Overton, 1977).

Statistical Analysis

Data was processed through four (4) consecutive steps with suitable statistical procedures applied to answer the objectives of the study. All tests were performed in Python statistical software packages (NumPy, Pandas, SciPy, Scikit-learn, and Factor-Analyzer), with significance level of $\alpha = 0.05$ for all of our analyses.

Stage 1: Descriptive statistics. The distribution of responses across all 23 items was described by initial analysis. Means, standard deviations, minimum and maximum values, variance, skewness, and kurtosis were measures. The statistics offered a broad characterization of participants' legal competence and highlighted items with notably higher and lower scores (and items of high variability). The grand mean value was calculated across all items to provide an overall competency baseline in the data set.

Stage 2: Inferential Statistics. To determine the relationships among the 23 competency items we used Pearson correlation coefficients. The entire correlation matrix was generated for the present data set, and the best 20 correlations were found among each item, which showed the strongest inter-item relationships. The overall pattern of associations was characterized by correlation statistics (mean, median, maximum and minimum). As well as that, a one-sample t-test for each item was conducted to see how well average ratings were related to the value (3.0) in the scale midpoint – indicating if directors' ratings were considered as above and below moderate competency levels.

Stage 3: Exploratory factor analysis (EFA). EFA was performed to seek to find hidden dimensions of legal competence. Data suitability was determined by analyzing the Kaiser-Meyer-Olkin (KMO) measure of the appropriateness of sampling and Bartlett's test of sphericity prior to factor extraction. The KMO of 0.804 was "meritorious" adequacy, and Bartlett's test also was highly significant ($\chi^2 = 1061.48$, $p < .001$), indicating that the correlation matrix was conducive to factor analysis. Principal axis factoring with oblique (promax) rotation in factor extraction enabled correlated factors as theoretical considerations indicated that the different dimensions of legal competency would be interrelated. The number of retained factors was calculated with various considerations considered. These were Kaiser's eigenvalue-greater-than-one rule, scree plot examination and interpretability of factor solutions. Ultimately, five factors were included to account for 76.8% of the entire variance. Factor loadings were used to interpret the meaning of each factor, where loadings ≥ 0.40 were considered meaningful (Stevens, 2009). Items were also assigned to factors according to their highest loading, and factors were labeled depending on the content of the constituents. By using regression, factor scores were calculated for each participant, thus obtaining continuous measures of the individual's standing on each of the five latent dimensions.

Stage 4: Multivariate Regression Modelling. In order to predict overall legal competency from the five factor scores, a multivariate linear regression model was fitted. The dependent variable was calculated as the means of all 23 items for individual subjects, indicating overall legal competency. Independent factors consisted of the five factor scores produced from EFA. Model performance was assessed using several metrics: R-squared (R^2), adjusted R-squared, root mean square error (RMSE), and mean absolute error (MAE). Standardized regression coefficients (β) were examined to examine the relative importance of each factor in predicting overall competency. The model validity was assessed using 5-fold cross-validation: it divided the data into five subsets, trained on four subsets and then tested on the fifth and repeated five times through different test subsets. The mean cross-validation R^2 and its standard deviation provided evidence of model generalizability beyond the training sample.

Figure 1 presents a methodological flowchart summarizing the research design, sample characteristics, data collection procedures, and analytical stages.

Figure 1. Methodological flowchart depicting the research design and analytical procedures.

Results And Analyst

Descriptive Statistics

Descriptive analysis of the 23-item legal competency questionnaire revealed substantial variation in perceived competency levels across different dimensions. Table 1 presents comprehensive descriptive statistics for all items, including measures of central tendency, dispersion, and distribution shape.

Table 1*Descriptive Statistics for Legal Competency Items (N = 52)*

The grand mean for all 23 items was ($M = 3.647$, $SD = 1.144$), indicating that Colombian educational directors believe their legal skills are moderately above the midpoint of the scale. This suggests an overall positive level of self-reported legal literacy, although much room for improvement remains. A grand standard deviation of 1.144 suggested considerable variation between items and among subjects. Patterns were evident that were identified through Item level analysis.

The highest rated items were items 2 ($M = 4.154$, $SD = 0.937$), Item 13 ($M = 4.135$, $SD = 0.908$), Item 1 ($M = 4.000$, $SD = 0.929$), and Item 18 ($M = 3.981$, $SD = 0.896$). These items, which were located in the higher part of the scale, were probably competency dimensions where directors are most confident — like foundational regulatory knowledge and compliance processes, for example. In contrast to the highest rated items, the lowest rated items were Item 14 ($M = 2.519$, $SD = 1.229$), Item 21 ($M = 2.846$, $SD = 1.433$), Item 4 ($M = 2.865$, $SD = 1.253$), and Item 15 ($M = 2.885$, $SD = 1.215$). These were less than the mid-point of 3.0 on the scale, indicating the perceived deficiency in competency areas was low. These might indicate those who have more highly developed or specialized legal knowledge covering crisis legal response, special education law, or interpreting high-level law which is an increasingly complex subject matter that has been found by previous research to be especially challenging for education professionals (Casale et al., 2024; Pérez et al., 2021).

The high variability (2.054) and standard deviation (1.433) for Item 21 shows the high degree of disagreement among directors with respect to this competency dimension (Variability). Items 14, 15, 16 and 17 were also statistically variable (ranging from 1.469 to 1.509), indicating diversity in competency levels among the sample. Items 3, 18, 19 and 13 also had low variance (variances 0.783-0.825) indicating stronger competency level, although less highly varied in this respect. In the distribution shape analysis, in general all items had a negative skewness (responses were grouped on the higher (or top) end of the scale) and the longer tails were on the bottom end of the scale. This trend mirrors a sub-sample of training educational directors who have a minimum level of competence, differing in the degree of their ability.

The lowest-rated items (items 4, 14, 15, 21) had skewness positively or near-virtually zero, suggesting symmetrical or right-skewed distribution where it seemed as responses were more evenly distributed and higher in the middle or on the lower-end of the scale. Kurtosis showed negative kurtosis (platykurtic distributions) on several items (i.e., Items 4, 14, 15, 16, 21): flatter distribution with smaller extreme values. This suggests that the ability of directors to measure (i.e., rate) their competencies in dimensions related to competency is spread over the range and not the mean. Likewise, other items show negative kurtosis with moderate size which is a way of saying that the distributions reasonably flat or flat however it should never be said that they are significantly flatter than normal.

Figure 2 shows four panels representing main descriptive findings of the analysis which include (a) mean scores per item, from highest to lowest, (b) deviation (standard deviation) in the scores per item, (c) distribution of scores over all items and (d) frequency distribution of each scale point over all responses.

Figure 2. Analysis of legal competency survey data. Panel A shows mean scores by item (sorted), with a midpoint reference line at 3.0. Panel B displays variability (standard deviation) by item. The distribution of scores for all items is presented in Panel C. The overall response distribution is shown in Panel D, along with frequencies and percentages for each scale point.

The distribution of responses shown in Panel D (Figure 2) illustrates that the modal response was 4 ($n = 366$, 30.6%), closely followed by 5 ($n = 332$, 27.8%), and 3 ($n = 300$, 25.1%). Responses of 2 ($n = 140$,

11.7%) and 1 ($n = 58$, 4.8%) were also less frequent. This distribution confirms the overall tendency to favor positive self-assessment, yet reinforces the fact that around 16.5% of responses fell below the midpoint, suggesting perceived weakness in particular competencies.

Inferential Statistics

Correlation analysis examined relationships among the 23 legal competency items to identify patterns of association that might suggest underlying factor structures. Table 2 shows the top 20 correlations, i.e., strongest inter-item relationships in the dataset.

Table 2

Top 20 Correlations Between Legal Competency Items

Inter-item correlations were also large measured by correlation matrix (mean; 0.424; median; 0.512). Items 10–11 exhibited the largest correlation ($r = 0.837$), and therefore, indicate that these items are two closely correlated components in the competency. The associations were similar as well for Items 18–19 with $r = 0.821$, Items 8–9 with $r = 0.816$ and Items 9–10 with $r = 0.804$. High correlations would show that the items cluster more or less on the basis of common underlying characteristics. The matrix minimum correlation (minimum correlation, -0.187) is the following, thus, to summarize:

Most items were in positive correlation; some were in weak negative correlation. However, the weak negative correlations suggest legal capabilities items usually represent many of the same dimensions and similar items within the same domain as the reverse constructs. The value of 0.837 indicated that for the best correlation nonetheless, below the cut off (0.90-norm), which is presumably indicative of item redundancy. Correlation pattern analysis indicated that some items were significantly correlated with one another and that Items 8, 9, 10, 11, 18, 19, and 22 were specifically clustering after having more than 0.70 correlations. The cluster represents a unit of knowledge identified as legal competency most probably related to the knowledge and use of regulation. Items 1, 2, 3, 7, 12, and 13 also exhibited high intercorrelation to each other in a different cluster. Items 16 and 17, for example, were individual pairs with strong positive correlations ($r = 0.794$) indicating a domain relevance to competence. One-sample *t*-tests were carried out to determine whether mean ratings for each item differed significantly from measure midpoint (3.0) indicating this moderate skill. Results by all 23 items are displayed in Table 3.

Table 3

One-Sample T-Tests Comparing Item Means to Midpoint (Test Value = 3.0)

Findings indicated that 20/23 items (87%) differed significantly from the midpoint. Seventeen items showed means above 3.0, meaning perceived competency exceeded the moderate threshold. These items probably reflect areas that Colombian educational directors are quite confident in understanding their legal training and skills. Means below the midpoint on three items (Items 4, 15, 21) did not differ significantly from 3.0, indicating perceived competency close to the moderate level. Item 14 provided a significantly lower mean ($M = 2.519$, $t = -2.822$, $p = .007$), demonstrating strong evidence of perceived lack of skill in the competency domain. Inferential statistics, shown extensively in Figure 3, present as follows: (a) correlation heatmap of the relationships among all items; (b) distribution of correlation coefficients; (c) the top 10 correlations; (d) scatterplot with the most highly correlated items (Items 10 and 11, $r = 0.837$).

Figure 3. Legal competency items: inferential statistics. The correlation heatmap for all 23 items is shown in Panel A. It is shown in Panel B with the distribution of correlation coefficients where the mean (0.424) is shown. Top 10 correlations are presented in Panel C.

The strongest pairs of items associated with each other are illustrated in Panel D (Items 10–11, $r = 0.837$). The correlation heatmap (see Panel A, Figure 3) shows clear clustering among pairs of items with darker red patterns corresponding to stronger positive correlations. According to the correlation coefficient distribution (Panel B), this shows a nearly normal distribution centered slightly above 0.40, with most correlations falling between 0.20 and 0.70. This result is consistent with a multidimensional construct measuring related but distinct components of legal competency.

Exploratory Factor Analysis

Exploratory factor analysis (EFA) of latent elements in legal competencies was carried out. The data were tested to determine appropriateness using two standard tests before factor extraction. Kaiser-Meyer-Olkin (KMO) sampling adequacy value of 0.804, which according to Kaiser's criterion was classified as "meritorious" (Kaiser, 1974), confirming that data were adequate to evaluate the sample for factor analysis. Bartlett's test for sphericity was also highly significant ($\chi^2 = 1061.48$, $df = 253$, $p < .001$), which indicated that the correlation matrix was different from an identity matrix and thus had enough common variance for factor extraction.

The factor extraction used principal axis factoring with oblique (promax) rotation. Several criteria were used to ascertain how many factors would be retained. Kaiser's rule of eigenvalues greater than one recommended five factors with eigenvalues of 12.00, 2.19, 1.64, 1.13, and 1.04. The scree plot analysis (Figure 4, Panel A) clearly showed an elbow after the fifth factor which showed we can keep five factors as shown. The five-factor solution also showed acceptable interpretability: for each factor a well-defined component was represented. The five-factor solution explained 76.8% of the total variance, above the recommended 60% threshold for social science research (Hair et al., 2010). Table 4 presents the variance explained by each factor individually and cumulatively.

Table 4

Variance Explained by Five-Factor Solution

Factor 1 was identified as the primary factor accounting for 24.9% of variance. Factor 5 accounted for 22.1% of the variance, which was the second most important factor of the explanation. Factors 4, 2, and 3 explained 13.1%, 9.5%, and 7.1% of variance, respectively. The cumulative variance explained by the five factors (76.8%) suggests that the solution captures a substantial majority of systematic variance in the data. Table 5 presents factor loadings for all items on each of the five factors. Items are listed with their highest loading highlighted, and loadings below 0.30 are omitted for clarity.

Table 5

Factor Loadings for Five-Factor Solution (Promax Rotation)

Factor 1: Regulatory Knowledge and Application (24.9% variance). In this factor we could have 10 items with loadings around that range of 0.514 to 0.825. Factors are information about level of educational regulation knowledge, interpretative capacity in interpreting legal codes and usage of the legal requirements as practical requirements, as per institutional frameworks. On the basis of the large loadings of Items 18, 22 and 19, it indicates this factor is the important component of the legal competence: a knowledge and skills required for compliance and in legal judgment.

Factor 2: Institutional Compliance and Documentation (9.5% variance). This factor comprises 3

items (Items 23, 20, 21) for a size of (0.654 to 0.806). The components also include items on systematic compliance process and practice and the institutional mechanisms applied in practice (i.e., compliance processes, documentation, institutional accountability, systems of documentation, institutional accountability). The second dimension of complexity and flexibility in regulatory compliance is the dimension of legal professional competency, accounting functions, the technical dimensions, the operations of legal competence - holding the ability to produce timely record keeping, following official procedures and demonstrating compliance with regulatory authorities.

Factor 3: Crisis Legal Response (7.1% variance). This factor is 2 items (Items 14 and 4 with loadings = 0.861 and 0.746). These items include the following legal competencies employed under disasters and crises such as emergency response, legal dilemmas, and dealing with unexpected litigation challenges. The limited mean and significance of the scores for these items ($M = 2.519$ and 2.865) and appearance as independent factors would reveal that crisis legal response is an especially challenging competency area that Colombian educational directors encounter.

Factor 4: Strategic Legal Management (variance 13.1% of total variance). The factor is organized as 5 items (Items 7, 5, 12, 6, 13), ranging from 0.405 to 0.731: These factors have items loading the elements of integrating legal considerations into strategic planning, proactive legal risk management and alignment compliance of legal and institutional mission. This dimension represents a wider level of legal competency—a reflection of legal thinking embedded not only in reactive compliance but also strategic thought and integration of legal thinking in leadership practice.

Factor 5: Foundational Legal Literacy (22.1% variance). This factor has 3 items (Items 2, 1, 3) and ranges in loadings from 0.716 to 0.795. Core legal knowledge, fundamental rights and responsibilities, and general legal attitudes. The high mean scores in these items ($M = 4.154, 4.000, 3.962$) and variance for each one, however, indicate that while they can explain, the strength area of knowledge law, fundamental legal literacy level is not sufficient for Colombian legal professionals to perform successfully. Several items had significant cross-loadings on several factors indicating the relevance to some dimensions of the competency. e.g. Item 10 was Factor 1 (0.719) and Factor 5 (0.556), that is, it is located between regulatory application and foundational literacy. Item 16 (0.601) and Factor 4 (0.620) were loaded for, which indicates that regulatory knowledge would be related to managerial strategies.

These cross-loadings are evidence of the integration between competencies in practice, which is likely to involve a number of dimensions in simultaneous interaction with the real conditions of administration. Full EFA results visualizations are shown in Figure 4: (a) scree plot showing eigenvalues of all factors, (b) variance explained by all factors, (c) factor loadings matrix heatmap and (d) distribution of factor scores per sample.

Figure 4. The results of exploratory factor analyses. Panel A shows the scree plot with eigenvalue = 1 criterion (Kaiser rule), and a five-factor solution. Panel B shows variance for each factor (individual and cumulative). The factor loadings matrix heatmap is shown in Panel C. Panel D presents factor scores across participants with five factors as a whole.

The scree plot (Panel A, Figure 4) shows the elbow after the fifth factor, reinforcing the rationale for five factors remaining. The variance explained chart (Panel B) indicates that factors 1 and 5 are the most significant contributors to the solution with factors 4, 2, and 3 making progressively smaller contributions. The factor loadings heatmap (Panel C) indicates the trend of item-factor relationships, with the darker colors depicting stronger loadings. The factor score (Panel D) suggests that all five factor distributions follow normal distribution lines centered in the zero region according to the method of factor score calculation.

Multivariate Regression Model

A multivariate linear regression is developed to predict overall level of legal competency from

five factor scores measured from EFA. All 23 items (for each participant) were used to calculate the dependent variable, overall legal competency. Independent variables were the five factor scores (Factor 1: Regulatory Knowledge and Application; Factor 2: Institutional Compliance; Factor 3: Crisis Legal Response; Factor 4: Strategic Legal Management; Factor 5: Foundational Legal Literacy). The above regression model showed excellent predictive capability. The performance metrics of the model are provided in Table 6.

Table 6

Multivariate Regression Model Performance Metrics

The model accounted for 99.88% of variance in overall legal competency ($R^2 = 0.9988$), and an adjusted R^2 of 0.9987 suggested that there was little shrinkage to the model due to number of predictors. The RMSE=0.0234 and MAE=0.0181, respectively, suggest that our predicted values deviated from actual values (approximately 0.02 scale points) — an extremely small error over the 1–5 scale range. Cross validation (five folds) produced a mean R^2 of 0.9981 (SD = 0.0011), indicating excellent stability and generalizability (even beyond the training).

Table 7 presents regression coefficients, standardized coefficients (β), and their interpretation.

Table 7

Regression Coefficients and Standardized Coefficients

All five factors showed positive relationships with overall legal competency, which suggests that each dimension promotes a complete foundation in legal literacy. Yet, the relative importance of variables differed widely, as evidenced by standardized coefficients.

Factor 1 (Regulatory Knowledge and Application) was found to be the most predictive of overall legal competency, as evidenced by the largest coefficient ($\beta = 0.6429$), indicating that an increase of 1 standard deviation in regulatory knowledge was associated with a 0.64 standard deviation increase in overall legal competence. Such finding supports regulatory knowledge as the foundational component of legal competency and the dimension most positively correlated with overall legal literacy.

Factor 5 (Foundational Legal Literacy) was the second- strongest predictor ($\beta = 0.2984$), indicating that legal basic knowledge and awareness becomes an important basis for full competency. The large coefficient for this factor and high mean scores of descriptive analysis suggest that although the directors of Colombian education have good baseline knowledge, it is not enough to have a complete legal competence.

Factor 2 (Institutional Compliance), was moderately positively related ($\beta = 0.4157$), and thus systematic compliance and documentation contribute to overall competence. This finding adds to the importance of operational legal skill—the ability to convert knowledge into routine institutional activity. Factor 4 (Strategic Legal Management) showed a moderate positive correlation ($\beta = 0.1510$) which means that consideration in strategic legal impact design facilitates overall strategic competence but that is less than in regulatory knowledge or fundamental literacy. Perhaps this is a consequence that strategic legal management is a higher order competency than other relatively basic competencies.

Despite the relatively large standardized coefficient, Factor 3 (Crisis Legal Response) had the weakest relationship with overall competency ($\beta = 0.05485$). But the apparent paradox here is that it shows a relatively low mean score and a high level of variability in factors—crisis response capabilities are important but not clearly related to overall competency, as a significant part of the directors does not appear to have a strong background or high training in this domain. Figure 5 The regression model is visualized with (a) actual vs. predicted values (fitting of the model) with (b) residual plot examining

the assumptions.

Figure 5. Multivariate regression model results. Panel A shows actual versus predicted overall legal competency values, demonstrating near-perfect fit ($R^2 = 0.999$). Panel B presents the residual plot, with residuals falling within ± 1 SD, indicating good model fit and homoscedasticity.

The actual vs predicted plot (Panel A, Figure 5) shows the overall good fit of the model, where all the data points lie (almost exactly) along the diagonal line representing perfect prediction. Panel B: Residuals at random, mostly around zero (no pattern), consistent with homoscedasticity and linearity. All residuals are within ± 1 standard deviation, which shows that no statistically significant outliers or influential cases exist.

The extraordinary performance of the model, $R^2 = 0.999$, justifies interpretation. In this context, this strong R^2 value may suggest overfitting, but a number of reasons are cited to reinforce the validity of the model. Firstly, the dependent variable (overall competency) was computed as the mean of all the items while the independent variables (factor scores) were obtained from those same items via factor analysis. This mathematical relationship generates good prediction naturally. Second, cross-validation shows the model generalizes strongly to new data (mean $R^2 = 0.998$), which is against overfitting. Third, the aim of the model is description and explanation rather than pure prediction, i.e. determination of the relative importance of the dimensions of competency instead of prediction for some future outcomes.

Pragmatically, the regression model can provide valuable information, via which to develop legal competencies. The results reveal that the greatest predictor is regulatory knowledge (Factor 1), and that interventions targeted at this dimension will lead to the largest impact on the overall legal competency. Therefore, foundational literacy-Factor 5 and institutional compliance-Factor 2 contribute moderately, and a more holistic approach emphasizing multidimensional competency development as opposed to the regulatory knowledge-only focus. With relatively weak contribution of crisis response (Factor 3) and low mean scores, this indicates the importance of this as a gap requiring targeted intervention.

Discussion

Interpretation of Factor Structure

The five-factor structure formed by exploratory factor analysis provides empirical evidence that legal competencies are multidimensional in educational leadership. The presence of multiple interlinked dimensions in order to produce effective legal literacy as opposed to a single unitary construct is consistent with theoretical models of successful legal literacy (see Babenko 2023; Hughes 2023). As a result, different dimensions for regulatory knowledge, foundational literacy, institutional compliance, strategic management, and crisis response emerged, indicating that development of comprehensive legal competency involves a focused attention to each dimension.

The predominance of Factor 1 (Regulatory Knowledge and Application), accounting for 24.9% of the variance, suggests a dominant role for applied regulatory knowledge in educational directors' legal competency profiles (Santos et al., 2025; Henao et al., 2024). This is in line with studies highlighting how educational administrators have constantly adapted to ever more challenging (and contradictory) regulatory environments demanding both deep knowledge of educational law, policy implementation and compliance aspects (Mašát, 2023; Santos et al., 2025; Tapia et al., 2023; Pérez et al., 2024). Items in this factor are all associated with the competencies well-established in previous research in regard to educational leadership such as interpreting legal norms, applying regulations in various settings, and coming up with legally appropriate decisions (Souza et al., 2023; Marín-González et al., 2021). However, understanding one dimension of legal knowledge in contrast with basic legal literacy (Factor 5), implies a critical conceptual distinction (Babenko, 2023; Bergeron et al., 2023; Yoza et al., 2025).

Foundational literacy involves core legal understanding and comprehension of basic rights and responsibilities, whereas regulatory literacy comprises a nuanced repertoire of skills to conceptualize, interpret, apply, and operationalize intricate legal systems (Henao et al., 2024; Gonzalez, 2023). This distinction, with its implications in professional development, will suggest that training needs to evolve from basic knowledge frameworks to higher-level regulatory application rather than considering legal competency as simply a single undifferentiated skill set (Babenko, 2023; Carolino et al., 2023; Weinstein & Muñoz, 2023). We recognize the presence of Factor 2/Institutional Compliance and Documentation as an operational item with focus on legal capability. It resonates with literature focusing on accountability, documentation, and systematic compliance practices being increasingly central in educational administration (González et al., 2025; Souza et al., 2023).

Juridification processes described by González et al. (2025), and this is evidenced in the case of Chile by the situation where the preeminent position of legal logic and bureaucratic mechanisms of educational administration are clearly visible in Colombian directors' competence profiles. The fact that compliance is a specific factor means that directors' knowledge is inadequate for the translating of legal knowledge in their operational experience of their institution and should have competency in procedure. Factor 3 (Crisis Legal Response) is the most troubling finding perhaps. The substantial identification of crisis response as an independent variable complemented by the comparatively small mean number per item ($M = 2.519, 2.865$), indicates that Colombian educational directors' levels of legal competency are significantly lacking. This finding is in agreement with the study of Burai et al. (2023) who reported the lowest satisfaction among the Croatian principals when it came to crisis management skills; Pérez et al. (2021) described fundamental weaknesses in Colombian institutions addressing the legal context of conflict. Low performance on crisis response items suggests that although directors appear to have sufficient knowledge regarding routine legal matters to deal with, they would not be prepared for sudden lawsuits, crisis-level decisions, or high stakes conflict mediation.

Emphasizing Factor 4 (Strategic Legal Management) as a single dimension provides empirical ground by which one can analyze legal competency according to more than compliance, but integrating legal thinking into the institutional planning process and the practice of leadership (Bergeron et al., 2023; Misad et al., 2022). This indicates the shift from administrative to pedagogical management discussed by Misad et al. (2022), which argues that effective educational leadership is not only about complying with laws, but on the other side of the spectrum, aligning legal compliance with educational mission and institutional objectives.

The moderate variance accounted for by this factor (13.1%) indicates that strategic legal management is a newly-formed but still underutilized dimension of Colombian directors' skills profile. Factor 5 (Foundational Legal Literacy) accounting for 22.1% of variance, which explains the second largest contribution to the factor structure (Babenko, 2023; Hughes, 2023; Santos et al., 2025). The items on the factor had a high mean score ($M = 4.154, 4.000, 3.962$) which indicates that Colombian educational directors have knowledge on basic legal concepts (Romero et al., 2023; Tróchez, 2023). These results suggest that common legal awareness is an established competence in effective administrators (González et al., 2022; Neira et al., 2025). However, the distinction between foundational literacy and more sophisticated dimensions (regulatory application, strategic management, crisis response) underlines that basic knowledge constitutes an important, though not sufficient, component of full legal competency (Casale et al., 2024; Henao et al., 2024; Weinstein & Muñoz, 2023). This pattern aligns with Hughes' (2023) observation that administrators recognize the need for contextualized, practical legal education—something beyond just the rudiments of law (Carolino et al., 2023; Loor et al., 2025).

The factor structure also incorporates important features, like the inter-loadings and interrelatedness among factors. Some were similarly quite high on multiple things, which aligns with the interdependency relatedness of legal competencies in practice. For example, regulatory interpretation items were both on regulatory knowledge (Factor 1) and strategic management (Factor 4), suggesting to effective strategic legal management a reliance on regulatory knowledge as a foundation. Items related to institutional procedure loaded on compliance (Factor 2) and regulatory knowledge (Factor 1), emphasizing the need for consistent compliance mechanisms that are tied to substantive knowledge of regulations. These patterns are in tandem with another legal competency

developmental thought frame through which fundamental dimensions lay the foundation for higher level competences.

Predictive Model and Practical Implications

The very good predictive power of the predictability of multivariate regression ($R^2 = 0.999$) suggests the high validity of the five factor structure, as well as highlights crucial data related to the importance of the areas of focus of different competencies. These findings ($\beta = 0.643$) indicate that Factor 1 (Regulatory Knowledge and Application), is the best predictor of overall legal competency, which has material ramifications for determining focus areas of professional development and resource allocation. This finding indicates that interventions aimed at regulatory knowledge and application skills may generate the largest increase in overall legal proficiency.

Professional development programs could thus focus on engagement with education law and policy interpretation, or in operationalizing the regulatory framework in specific institutional contexts (Babenko, 2023; Hughes, 2023). Babenko's (2023) situational-activity-based model, which includes case studies and problem-based learning seem to be particularly beneficial in learning the regulatory knowledge and application skills most important in this work. The important inclusion of Factor 5 (Foundational Legal Literacy, $\beta = 0.298$) reveals that fundamental legal knowledge is fundamental for holistic competence (Romero et al., 2023; Tróchez, 2023; Santos et al., 2023). However, the relatively low contribution of this factor (less than half the contribution of regulatory knowledge) indicates that professional development needs to move beyond basic concepts to higher-level application skills (Carolino et al., 2023; Weinstein & Muñoz, 2023). This finding also critiques approaches that conceptualize legal training as a one-time exposure to fundamental legal concepts; rather, to further continue professional development efforts that create increasingly critical skills (Carolino et al., 2023; Loor et al., 2025; Zambrano et al., 2022; Borges et al., 2024). The moderate contribution of Factor 2 (Institutional Compliance, $\beta = 0.416$) emphasizes the role of operational legal skills—knowledge that practitioners can translate into consistent institutional practice through systematic procedures and documentation (Souza et al., 2023; Cuenca et al., 2025; Marín-González et al., 2021). This result is consistent with studies analyzing juridification processes in educational administration, whereby institutional practice is increasingly governed by compliance procedures and accountability mechanisms (González et al., 2025; Anaya, 2023; Pérez et al., 2024).

Professional development programs should entail not only theoretical legal knowledge but practical training involving compliance systems and documentation requirements, and institutional accountability mechanisms (Tapia et al., 2023; Santos et al., 2025). It is necessary to critically assess the relatively moderate effect of Factor 3 (Crisis Legal Response, $\beta = 0.549$) on the response (Burai et al., 2023; Pérez et al., 2021). While the standardized coefficient is significant, the factor's low mean scores and its enormous heterogeneity suggest that many directors possess little or no crisis legal management history or training (Hughes, 2023; Casale et al., 2024; Cuenca et al., 2025). This indicates that crisis response is one of the most significant gaps that need targeted intervention but currently its development is inadequate in terms of overall competency and its contribution to crisis management is limited (Romero et al., 2023; González et al., 2022). The result is in line with findings by Burai and colleagues (2023) and Pérez et al. (2021) finding shortfalls in crisis management and conflict resolution competencies among educational administrators (Misad et al., 2022; Tróchez, 2023).

From a policy perspective, these findings have several important implications (Luna et al., 2024; Pertuz et al., 2024; Weinstein & Muñoz, 2023). First, director selection criteria need to cover multiple dimensions of legal knowledge over written exams, which may be a poor reflection of fundamentals only (Romero et al., 2023; Cabrera, 2022; González, 2023). The existing Colombian method of qualification, which is built on knowledge qualifications, and written examinations may limit the selection of candidates with higher levels of regulation application, strategic management, and crisis management skills (Tróchez, 2023; González et al., 2022). Talent selection can be based on case-based testing, simulations or portfolio assessment, based on practical legal skills in authentic world scenarios (Cabrera, 2022; Meza, 2024; Yoza et al., 2025). Second, the education and certification requirements should systematically target the five dimensions of competency (Carolino et al., 2023; Santos et al., 2023; Henao et al., 2024).

The discovery that various dimensions contribute differently to overall competency also indicates that the professional development needs to be designed with intensity as a focus upon information and practice, but also with focus to compliance procedures, strategic management and crisis adaptation (Carolino et al., 2023; Santos et al., 2023; Loor et al., 2025; Zambrano et al., 2022). Carolino et al.'s investigation concluded the legal loopholes in continuous training (2023) in Brazil seem to be relevant to Colombia as well, with a need for policy changes that require and support legal education for educational directors (Tapia et al., 2023; Barrera, 2021). Third, the factor framework offers a method for creating competency-based evaluation systems for educational directors. Instead of considering legal skill as a single dimensional entity, a system of evaluation would measure performance in relation to the five factors and offer more in-depth feedback and targeted strategies for development (Bergeron et al., 2023; Souza et al., 2023). This would be in line with international trends toward competency-based education leadership frameworks and would address the distinctive legal competency dimensions associated with the Colombian context. Fourth, the results indicate the lack of specialized systems to respond to deficiencies of crisis legal responses.

Due to low mean scores on crisis response items and the negative implications that can arise from insufficient crisis management capabilities (Pérez et al., 2021), education systems may develop legal advisory services, processes for emergency responses to crises, or mechanisms for rapid consultation to assist directors dealing with unforeseen legal issues (Casale et al., 2024). These support systems could support development of individual competencies with institutional resources that help directors manage nuanced legal issues.

Comparison with International Literature

The findings of this study are congruent with but extend international literature on the assessment of legal competencies in educational leadership. The multidimensional factor structure explored above resonates with competency frameworks established in other contexts, but also reflects dimensions unique to the Colombian and Latin American education context.

Factor 1 states the importance of knowing and applying regulation correlates with studies conducted by various countries that highlight the significant role that legal literacy plays for education administrators. Hughes (2023) concludes that school administrators overwhelmingly endorse context-specific legal literacy training, but only 10% receive such preparation, which indicates that the U.S.-targeted need-to-provision gap exists in Colombia. Similarly, Casale et al. (2024) documentation of significant gaps in special education law preparation for principals and special educators finds that inadequate legal readiness is a global issue not unique to Colombia or Latin America.

Another factor, Crisis Legal Response, has significantly lesser scores, but related to the results from Croatia, through Burai et al. (2023), who found that principals reported the lowest level of satisfaction with crisis management competencies. This cross-national consistency would suggest that crisis legal response constitutes a particularly challenging competency dimension that will require different approaches for training across educational system contexts. The deficiencies noted by Pérez et al. (2021), in the Colombian institutions' response to due process, right to defense, and presumption of innocence in conflict situations reflect wider problems with training educational leaders for high-stakes, legal decision making. The juridification processes described by González et al. (2025) in Chile—where the establishment of the Superintendence of Education has strengthened legal logic and bureaucratic procedures in educational administration—in order to frame the coming of institutional compliance (Factor 2) as a different dimension.

The Chilean experience shows that with stronger accountability mechanisms in place and regulatory oversight in educational systems, compliance competencies become critical and distinct from knowledge of the law. Colombia's education system has no superintendence like the one in Chile; however, the system in Colombia has some accountability measures that might stimulate further differentiation of compliance competencies.

Building on its findings by providing empirical evidence, the proposed differentiation of foundational legal literacy (Factor 5) vs. advanced regulatory application (Factor 1), which expands our

knowledge of legal competency, is an extension of existing competency frameworks, because legal competence is not just one dimensional, but a qualitative continuum. This finding offers a challenge to approaches that treat legal training as a single intervention, allowing for differentiated professional development to cater for discrete levels of competence and types (Babenko, 2023; Bergeron et al., 2023).

Comparison with other Latin American studies indicates some of the similarities and unique points of comparison in the Colombian context. Luna et al.'s (2024) conclude that Chile, Argentina, Mexico, and Peru have developed specific policies for developing school leadership, while Colombia lacks such systematic practices reflects the competency gaps present in this study. The lack of a holistic approach to leadership development in Colombia may explain the differential competency profiles in these countries due to strong background knowledge and relatively weak crisis management and strategic leadership skills. Souza et al. (2023), who compared the way states and municipalities regulate school director competencies, found that the term "competencies" is not used in the Brazilian legal texts—the term "competence do diretor escolar," for example—but is instead derived for responsibilities in the courts. Their study points to the possibility that the competency practices in Latin America's education systems may not be well-defined competencies that describe all aspects of the job that educational directors are responsible for. This uncertainty regarding legal definitions of director competencies may further explain some of the void in professional preparation and support highlighted in multiple studies (Carolino et al., 2023; Santos et al., 2023; Tróchez, 2023).

Neira et al.'s research on rural education (2025), under Colombia, points out the presence of contextual factors that affect the requirement of and development of legal competency. The discovery that resources offered to rural educational leaders influence the performance of such leaders, and, above all, that community involvement is of special significance, speaks to disparities of legal competency across institutional environments. Further work could explore if the factor structure revealed here generalizes across urban vs. rural localities, or if different contexts call for attention to different facets of competency. The Chilean model for school principals, as outlined by Cabrera (2022), which advocates merit-based access, transparency, and professional qualifications, may be a useful framework for reform in Colombian education policy. The Chilean requirement that principals should have teaching credentials, experience in managing a classroom, and school management experience together with appointment for such positions by independent qualifying commissions, would be a step forward in guaranteeing more rigorous director competencies in this regard when compared to Colombia's current system. But González et al. (2025) in Chile, for example, find that effectively implemented selection systems must still be supported by continuing education and professional development to respond to the changing legal considerations surrounding educational leadership. International competency frameworks, like the ones Ramírez (n.d.) reviewed among Latin American countries, should offer useful frameworks to address how to structure legal competency development. However, the particular factor structuring emerged in this study—namely crisis response as a unique dimension and the distinction between basic literacy and regulatory application—indicates that Colombian frameworks should be individualized with local conditions instead of blindly copying international models (Bergeron et al., 2023).

Limitations and Methodological Considerations

There are several limitations that should be considered while interpreting the results of this study. First, the sample size of 52 participants was adequate to conduct exploratory factor analysis according to the KMO measure (0.804), however below subject-to-variable ratios of 5:1 or 10:1 as often recommended (Costello & Osborne, 2005).

The second limitation of this study is the stability and generalizability of the factor structure, which indicates replication with larger samples is needed to validate the five-factor solution. Future studies need to use larger and more representative samples to confirm the factor structure and validate the stability of the structure across different subgroups of educational directors. Second, the cross-sectional design precludes causal inferences from our study of the relationships between variables. The fact that correlation exists is also a limitation to the model as the regression model does not find the

relationship as causality between factor scores and overall competency. Longitudinal designs would be required to examine how legal competencies unfold over time, to understand how separate dimensions relate to each other developmentally, and how competency profiles are related to administration effectiveness and institutional outcomes (Borges et al., 2024).

Third, the study is based on self-report, and might be influenced by social desirability bias, self-assessment bias and common method bias. Educational directors may overestimate their competencies as a result of social desirability or not noticing their real skill levels. However, they may underestimate competency in instances in which they sense a complexity in legal hurdles. More integrated evidence (across legal knowledge, behavioral observations, supervisor evaluations, institutional outcomes) (Casale et al., 2024) must be included in future research and include multiple qualitative and quantitative data to enhance more holistic and validated measures of competency.

Fourth, although the instrument employed in this study shows an acceptable degree of internal consistency ($\alpha = 0.89$), it has not been extensively validated, at least not to a large range of samples or contexts. This 23-item questionnaire was designed specifically for the present research, and requires further psychometric evaluation (e.g., confirmatory factor analysis with independent samples of staff, test-retest reliability testing and criterion validity studies that investigate the relationships between measured competencies and relevant outcomes, such as legal compliance, litigation rates, or stakeholder satisfaction) (Field, 2018).

Fifth, legal competencies are not directly related to relevant context variables, such as institutional type (urban/rural, public/private), director experience, educational background, or regional location. Such contextual factors might play a critical role in the competency levels and importance of different dimensions. For example, for rural directors, legal challenges could be different from that for urban directors (Neira et al., 2025), and for its type of directors, director training in law may present different competency profiles as compared to those holding a purely educational degree. It would be interesting to study whether contextual variables moderate the factor structure and the predictive relations indicated in this research.

Sixth, the high predictive performances found in the regression model ($R^2 = 0.999$) support a question: if there are overfitting or mathematical artefacts. The dependent variable (overall competency) was computed, which became the mean of all items, independent variables (a factor score) were created from those same items, therefore an equation emerged that naturally led to a good prediction. This makes the approach appropriate, but while it can help us understand how different competency dimensions are more or less influential, it means that the model doesn't allow for truly independent prediction. A study might investigate the relationships between legal competency factors and external determinants, such as institutional legal compliance, administrative effectiveness ratings or educational outcomes.

Seventh, the study does not specifically consider the content validity of relevant competency dimensions in detail. Although EFA created empirically the factor structure, the interpretation and annotation of factors remains subjective. It may be that a number of different constructions of factor structure are available, and the items loading on each factor may not capture all features of the labeled dimension. The article suggests that qualitative research on educational directors' experiences with legal challenges (combined with expert panel reviews of competency frameworks) may deepen understanding of content and boundaries of each dimension (Hughes, 2023).

Eighthly, the study does not look through the intersections of these competencies and school-specific leadership effectiveness, institutional outcomes and stakeholder satisfaction, examining only the legal competencies of educational directors. Although one would expect that legal competence is critical for effective governance, researchers remain unsure about the exact mechanisms by which legal competencies affect institutional productivity and educational quality. Subsequent research must analyze the mediating and moderating processes between legal competencies and outcomes perceived as valuable (Bayona-Rodríguez et al., 2025; Borges et al., 2024).

Lastly, its focus on the work of Colombian educational directors prevents sweeping implications for other countries in Latin America or the international system. Some of these patterns would also be

universalizable from the dimensions that were associated with legal knowledge in educational leadership, and others may be relevant to specific Colombian legal regulatory contexts, the organization of the education system or sociopolitical contexts therein. Had this comparative research been conducted in many countries, it would have helped to distinguish between universal (i.e., international) dimensions of legal competency from context-related factors (Luna et al., 2024; Pertuz et al., 2024). Nonetheless, the study adds insights to the literature regarding legal competencies related to educational leadership. A focus on identifying a five-factor structure in competency frameworks is a key to supporting policy and leadership response frameworks; and empirically this is supported with a regression model that adds perspective of the relative importance of dimensions and identifies critical gaps that require policy action and professional development responses.

Conclusions and Recommendations

The study is the first objective quantitative analysis that delves into the legal expertise of Colombian education directors, employing a well-established statistical approach to figure out how much structure or forecasting power such dimensions might possess and which they might reflect on the same underlying problems. The findings reveal a comprehensive picture of the competencies in common legal literacy and deep deficiencies in crisis management and strategic legal management ability. Exploratory Factor Analysis established a five-factor model comprising of: regulatory knowledge and application which comprise the empirical framework through which to understand the multi-dimensional nature of legal competencies as educational leaders. That construct is diametrically opposed to naive conceptualizations of legal competence as some unitary factor and represents actions that can be categorized into shapes that in turn require multiple analytic strategies.

The results of multivariate regression analysis show regulatory knowledge and application as the most significant predictors of overall legal competence. The other two predictors are relatively small, mainly foundational legal literacy and institutional compliance. This indicates some gaps in professional learning and policy change calling for broad attention on regulatory interpretation and enforcement, good base and appropriate track and record of compliance. The low scores in crisis legal response items and the specific nature of crisis response findings suggest that the assessment process gap is significant in Colombia's education directors' competency profiles. Given that the outcome targets professional development and support resources for professionals today, it may reflect formal training in crisis management, resolving and making decisions about legal actions in times of emergency, and institutional backup, for example, with legal advisory services.

This research demonstrates the relevance of a relatively under researched dimension of educational leadership in Colombia around legal skills. This multi-dimensional factor structure we have described here can facilitate more sophisticated competency structures, talent selection processes, and professional development services. The lack of crisis response and proper handling is severe in nature and requires a systemic policy reform and focused programmatic initiatives. As Colombia's and Latin American states' education systems mature, including the areas of accountability, compliance, and legal literacy, a relentless commitment to cultivating these professional in-depth legal skills—that educational professionals should possess—will become a factor of educational leadership and organizational success.

In the view of international literature, the present study wants to write a relevant literature in these competencies of educational heads in educational governance and educational leadership, and to respond to the pressing demands and context for Colombian and Latin American education systems. The application of its empirical methodologies to the analysis of a still under-researched subject of educational leadership will advance empirical research of policy formulation and continuing education programs and extend the frontier of research concerning this important issue. Such findings may aid in providing educational directors with the wide-ranging skills they need to comply with complicated laws, protect stakeholder interests, and promote best practice in their organizations in an ever-more juridically responsive educational landscape. From these insights, a series of policy, practice and future research recommendations can be proposed:

Policy Recommendations:

Create full competency frameworks for educational directors that consider directly and transparently each of the five dimensions of legal competence, beyond knowledge credentials for the contemporary attention on practical use, compliance, strategic management and crisis response (Bergeron et al., 2023; Souza et al., 2023).

Reform director selection to include evaluation on various competency dimensions through case-based assessments (e.g., case-based evaluations, simulation, portfolio assessment) rather than strictly written examination alone (Cabrera, 2022; Romero et al., 2023).

Set a standard of mandatory continuing education for all of the legal competencies and programs in all categories of education (Carolino et al., 2023; Santos et al., 2025) including basic, intermediate, and advanced levels with differentiated programming (Carolino et al., 2023; Santos et al., 2025).

Establish institutional supports, such as legal services, emergency response, and rapid consultation mechanisms to enhance personal competency development (Casale et al., 2024; Pérez et al., 2021).

There may be a need for competency-based evaluation systems for educational directors where assessments of performance can be integrated across several dimensions of legal competency and deliver focused developmental feedback (Bergeron et al., 2023).

Ethical considerations

This study did not involve, human tissue, animals, or clinical intervention. It was based exclusively on the analysis of anonymous perceptions of participants. Therefore, ethical approval and just informed consent were required for this study.

Data availability*

The bibliographic dataset underlying this study, including the final corpus of records analysed, is available in Mendeley Data at: doi: 10.17632/94bz4d3z9y.1. Extended data supporting this study, including supplementary tables and analytical outputs, are available here. No specific reporting guideline checklist was required for this study.

Reporting guidelines*

No study-design-specific reporting guideline was strictly applicable to this study.

Competing interests*

The authors declare that they have no competing interests.

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