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*Scientific articles*

## **Dirección y abordaje de la imprevisibilidad en las instituciones educativas públicas y privadas**

***Management and Approach to Unpredictability in Public and Private  
Educational Institutions***

***Gerenciar e lidar com a imprevisibilidade em instituições de ensino públicas  
e privadas***

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### **Resumen**

Este artículo aborda el liderazgo y la gestión de la incertidumbre, en instituciones educativas públicas y privadas, entendida como la imprevisibilidad y falta de control sobre los resultados de cada uno de los procesos educativos e institucionales. Gestionar la incertidumbre es un reto significativo en la educación. No es solo una capacidad teórica, sino una respuesta estratégica que exige a diario una disposición a gestionar situaciones cambiantes ante hitos críticos en las instituciones. El estudio realizado analizó cómo los directivos de las instituciones educativas gestionaron la incertidumbre mediante la planeación estratégica combinando análisis de riesgo, flexibilidad organizacional y comunicación efectiva. Este hallazgo es crucial, puesto que confirma que estas prácticas permiten la adaptación a cambios inesperados y la continuidad educativa. Por consiguiente, la investigación brinda un aporte práctico y metodológico al identificar rutas de planeación estratégica integral, que articulan procesos pedagógicos, directivos y administrativos mediante herramientas como el POA y el PMI. Herramientas proactivas, fundamentadas en los análisis de riesgos para la anticipación y mitigación de la imprevisibilidad de los entornos educativos.

La investigación realizada es de corte transversal y enfoque cualitativo, se empleó un diseño observacional para el análisis de las experiencias de cinco rectores de instituciones educativas en Colombia. La recolección de datos se realizó mediante entrevistas semiestructuradas, y



procesadas mediante el análisis temático con el software ATLAS. ti. Los resultados subrayan la importancia de herramientas y estrategias adaptativas para gestionar la incertidumbre educativa, reducir la imprevisibilidad, optimizar procesos administrativos y pedagógicos asegurando funcionamiento y la calidad institucional.

**Palabras clave:** Gestión de la incertidumbre; planeación estratégica; liderazgo.

## Abstract

This article addresses leadership and the management of uncertainty in public and private educational institutions, understanding uncertainty as the unpredictability of and lack of control over the outcomes of each educational and institutional process. Managing uncertainty is a significant challenge in education. It is not merely a theoretical capacity, but a strategic response that requires, on a daily basis, a willingness to handle changing situations in the face of critical milestones within institutions. The study analyzed how school leaders managed uncertainty through strategic planning by combining risk analysis, organizational flexibility, and effective communication. This finding is crucial because it confirms that these practices enable adaptation to unexpected changes and support educational continuity. Consequently, the research provides a practical and methodological contribution by identifying comprehensive strategic planning pathways that articulate pedagogical, managerial, and administrative processes through tools such as the Annual Operational Plan (POA) and the Institutional Improvement Plan (PMI). These are proactive tools grounded in risk analysis for anticipating and mitigating the unpredictability of educational environments. The research was cross-sectional in nature and qualitative in approach, employing an observational design to analyze the experiences of five principals of educational institutions in Colombia. Data were collected through semi-structured interviews and processed using thematic analysis with ATLAS.ti software. The results underscore the importance of adaptive tools and strategies for managing educational uncertainty, reducing unpredictability, and optimizing administrative and pedagogical processes, thereby ensuring institutional functioning and quality.

**Keywords:** Uncertainty management, strategic planning, leadership”.

## Resumo

Este artigo aborda a liderança e a gestão da incerteza em instituições de ensino públicas e privadas, entendida como a imprevisibilidade e a falta de controle sobre os resultados de cada processo educacional e institucional. Gerir a incerteza é um desafio significativo na educação. Não se trata apenas de uma capacidade teórica, mas de uma resposta estratégica que exige uma disposição diária para gerir situações em constante mudança, mesmo diante de marcos críticos dentro das instituições. O estudo analisou como líderes de instituições de ensino geriram a incerteza por meio do planejamento estratégico, combinando análise de riscos, flexibilidade organizacional e comunicação eficaz. Essa constatação é crucial, pois confirma que essas práticas permitem a adaptação a mudanças inesperadas e a continuidade educacional. Consequentemente, a pesquisa oferece uma contribuição prática e metodológica ao identificar caminhos abrangentes de planejamento estratégico que integram processos pedagógicos, gerenciais e administrativos, utilizando ferramentas como o Plano Operacional Anual (POA) e o Instrumento de Gestão de Desempenho (IGD). Essas ferramentas proativas, fundamentadas na análise de riscos, são projetadas para antecipar e mitigar a imprevisibilidade dos ambientes educacionais.

Este estudo transversal e qualitativo empregou uma abordagem observacional para analisar as experiências de cinco diretores de instituições de ensino na Colômbia. A coleta de dados foi realizada por meio de entrevistas semiestruturadas e processada utilizando análise temática com o software ATLAS.ti. Os resultados destacam a importância de ferramentas e estratégias adaptativas para a gestão da incerteza educacional, a redução da imprevisibilidade e a otimização dos processos administrativos e pedagógicos, garantindo, assim, o funcionamento e a qualidade institucional.

**Palavras-chave:** Gestão da incerteza; planejamento estratégico; liderança.

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## Introduction

Uncertainty in the educational context, defined as unpredictability and a lack of complete control over the outcomes of institutional processes, represents a significant challenge that should not be ignored. Instead, it requires constant attention to mitigate its negative effects (Biesta, 2017, p. 20). Therefore, administrators must recognize that uncertainty is a real, everyday, and critical problem that demands a constant willingness to confront it and manage each unforeseen and changing situation. It is crucial that institutions not only face uncertainty but also leverage it as a potential pedagogical tool for growth and to respond to the diverse needs of the social environment.

Existing literature emphasizes uncertainty management as the strategic capacity for mitigating risks and adapting school processes to unforeseen factors that directly affect three key dimensions: the organizational, referring to administrative and operational management (through tools such as the POA and the PMI); the pedagogical, focused on teaching and learning processes; and the institutional, which ensures the fulfillment of the mission and educational quality in crisis contexts.

For strategic leadership, it is essential that managers be true planners with a great capacity to define flexible and adaptive long-term goals .

From this perspective, Tejada proposes that within the context of planning, it is essential for managers to distinguish between risk and uncertainty. Risk encompasses future events that, while they may impact institutional objectives, can be identified, quantified, and proactively managed, whereas uncertainty is the lack of sufficient information to predict possible outcomes. (2022, p. 138)

Therefore, managing change involves strategic planning in organizational, pedagogical, and regulatory aspects, including phases such as situation analysis and the development of adaptive strategies as key processes to ensure the continuity and quality of each educational institution.

Despite the recognition of uncertainty as a challenge to overcome, an empirical gap persists in the literature regarding the mechanisms managers use to manage it. Nevertheless, their strategic understanding of how to address these situations within the planning process is a fundamental skill. This ability enables them to ensure the achievement of established objectives and guarantee that their institutions attain high levels of quality.

In this context, the overall objective of the research was to analyze how the managers of the selected educational institutions handled unpredictability during the strategic planning processes.

The main hypothesis held that each of the teaching directors who were part of the research manage uncertainty through a combination of risk analysis, organizational flexibility, and effective communication strategies.

This article is written because uncertainty has ceased to be an exceptional condition in school life and has become a permanent management factor. In educational institutions, both public and private, administrators make decisions under pressure, with limited resources, and in the face of changes they often cannot fully foresee. Even so, much of the literature addresses strategic planning in general terms, but offers less evidence on how principals, in practice, deal with daily unpredictability and maintain institutional continuity.

Hence the relevance of this study. The research seeks to understand, based on the real-world experiences of Colombian school administrators, which strategies allow them to respond to unstable situations without compromising educational quality. This is important, among other reasons, because recent situations such as the pandemic, dropout rates linked to economic hardship, regulatory demands, and technological gaps have shown that simply managing routines is insufficient: it requires leadership amidst change, adjusting processes, prioritizing resources, and communicating clearly. This practical and empirical gap fully justifies writing this article.

In this sense, the work does not simply describe a problem. Its value lies in demonstrating why studying uncertainty management is essential for the current educational field: because it allows for the identification of concrete pathways for planning, leadership, and institutional adaptation that can benefit other administrators, researchers, and educational policymakers. This, in essence, is the article's purpose: to provide useful evidence on a real, current, and insufficiently explored problem within the Colombian school context.

## **Background and Justification**

Cardona (2012) states that understanding the strategic planning and management of educational managers in institutions is necessary because it is necessary to explore the capacity of educational institutions not only to face uncertainty, but also to establish limits of tolerance that allow them to offer an adequate and relevant response to the needs of the social environment (p. 87)

Martínez, Gómez, and Martínez (2017) conclude that uncertainty management is the factor that enables the viability of management systems over time. Based on these principles, they propose a definition of uncertainty as the impossibility of making accurate predictions about the behavior of a complex system (p. 38).

### **Contextual theoretical references**

Based on what has been stated so far, it is identified that the theoretical bases of this research are the management of uncertainty, strategic planning and the leadership of teaching directors in educational institutions.

### **Uncertainty Management**

Managing uncertainty in educational settings refers to the ability not only of educators, but also of administrators and the community, to anticipate, confront, and adapt to multiple unpredictable situations or changes that may affect teaching and learning processes. This includes factors such as changes in educational policies, evolving socioeconomic conditions of students' families, natural disasters, and other factors that can impact these educational environments.

According to Galindo (2018), in addition to knowing how to manage uncertainty, effective leaders must develop sound plans to anticipate future chaotic scenarios (p. 56). Within the framework of basic and secondary education in Colombia, this management constitutes a strategic skill for channeling and mitigating the negative effects of unpredictability, preventing undesirable outcomes, defining strategies, and optimizing resources to achieve organizational objectives with a greater probability of success.

Therefore, for effective leadership and management of uncertainty, the educational leader must act as a “strategic designer.” This role involves the ability to anticipate the institution’s future needs in order to define long-term goals and implement the necessary strategies to achieve them. In environments characterized by uncertainty, strategic planning must, by definition, be flexible and adaptive (Yukl, 2013, p. 94).

Regarding the management of difficulties, Tejada (2022) argues that it is essential to differentiate uncertainty from risk, because risks are those situations in which we do not know what will happen, but we can make possible estimates of the distributions of the result; on the other hand, uncertainty refers to scenarios where there is no information whatsoever regarding what the possible results may be (p. 128).

Kotter (2011) argues that change management in educational institutions is an important process for adapting to the constant demands and challenges that the environment requires in terms of unpredictability, arguing that just as society evolves and transforms, educational institutions must be able to update their practices, methodologies and pedagogical approaches (p. 81).

### **Strategic planning**

Strategic planning should be an organized process that enables principals and coordinators to implement actions and decisions aimed at achieving medium- and long-term objectives. Its design seeks to optimize resources, strengthen pedagogical and administrative processes, and guarantee educational quality in a dynamic and competitive environment. For effective management, administrators must analyze the context, define the institutional vision (mission, vision, and values), and establish the goals that guide the direction of the Institutional Educational Project (PEI).

Thompson and Strickland (2020), in a study on strategic planning, suggest that the leader must take into account some phases such as situation analysis, definition of objectives, development of strategies, implementation and monitoring, evaluation and adjustment, adaptability and communication. All these phases will serve to adjust strategies and actions in response to unexpected changes and uncertain conditions (p. 63).

When beginning to plan an educational project, it is imperative to anticipate potential difficulties. This requires meticulous attention to detail in defining goals, timelines, and the resources necessary for the effective management of the institution. However, all forecasts in the school setting are subject to risks and uncertainties that can affect the leadership of the school administrator. Poor strategic planning in this context not only leads to project failure but also compromises the quality and functioning of the institution.

Planning each phase of an institutional project is always a necessary exercise that allows anticipating scenarios and mitigating risks, thus increasing the probability of achieving great successes.

However, despite the precautions taken across various variables, unforeseen events can always arise that jeopardize the project's continuity. Therefore, managers must be able to adapt to the circumstances, as adaptability is the ability to adjust strategies and actions in response to unexpected changes and uncertain conditions . Leaders with organizational

flexibility are empowered to redirect their strategic actions according to the demands of the environment.

In a summarized view of this approach, Glaister and Thwaites (2021) argue that environments are not uncertain in themselves, but rather become uncertain when viewed by human actors, where their perceptions will be important in assessing uncertainty. (p. 34).

## Leadership

Leadership is defined as the ability to influence a group of individuals to achieve common goals. This competency is no longer seen as an innate quality but is now understood as a technical and strategic skill that can be learned.

Leadership in managing uncertainty in educational settings is fundamental, as an effective leader not only guides the educational community effectively through difficult times but also fosters a culture of adaptability, resilience, and mutual collaboration. Key aspects of effective leadership in managing uncertainty include:

- Vision and clarity.
- adaptability and flexibility
- capacity building.
- data-driven decision making.
- promoting resilience.
- collaboration and team building.
- planning and preparation.
- empowerment and participation.
- change management.
- evaluation and feedback.
- Adjustment of strategies.

An effective leader must possess a set of qualities that will allow them to anticipate the unexpected, adapt quickly to changes in the environment, and propose strategies that facilitate the resolution or mitigation of difficulties.

Currently , educational leadership faces constant challenges due to systemic transformations such as globalization, technological advancements, and the evolving needs of students. In this context, government and international politics directly influence Colombian primary and secondary education by dictating educational reforms, quality standards, and responses to global crises (such as COVID-19), factors that ultimately disrupt

institutional planning. Consequently, the effective management of uncertainty is recognized as an essential skill for educational leaders across all sectors.

In this vein, and in accordance with the findings of Harris et al. (2010), educational leaders exert influence and guide the school community to achieve goals and objectives for the benefit of the group. This type of leadership is distinguished by its focus on improving educational quality, meaningful student learning, and the effective management of resources in educational contexts (p. 136).

Furthermore, within the field of educational leadership and under an intercultural approach, the characteristics of management in indigenous cultures have been explored. These studies demonstrate that the role of the leader in these communities presents distinctive features, given that decisions are made in a decentralized manner and consider the opinions of all participants. In this framework, the leader does not act overtly, but is fully integrated into the group and sometimes assumes the role of mediator (Goddard and Foster, 2012, p. 71).

Within this entire structure, transformational and transactional leadership styles have been shown to be the most studied. Although initially considered incompatible approaches, contemporary literature argues that they are complementary dimensions of managerial behavior. This integration is called the Full Range Leadership model, which proposes that an effective leader must be able to alternate between the exchange of rewards (transactional) and motivational inspiration (transformational) according to the demands of the environment (Bass, 1999, cited in Maza, 2015, p. 13).

From this perspective, transactional leadership refers to the exchange relationship between the leader and the follower to satisfy their own interests, which can take some forms of reward: contingent, management by exception, and passive leadership.

Northouse (2018) argues that transformational leadership should be a source of inspiration and motivation for each member of the team, in order to achieve quality and enriching performance, especially in contexts of change and transformation (p. 84).

Every leader must possess ethical and responsible qualities. Educational leadership not only guides processes but also shapes individuals, conscience, and society. A good leader directly influences decisions, relationships, and values that impact entire communities. Therefore, ethics and responsibility are not optional; they are the foundation of leadership. A leader without ethics may manage an educational institution, but cannot educate, because

ethics and responsibility transform leadership into a powerful force that humanizes the school and truly dignifies education.

In this sense, Fullan points out that leaders, to be effective, must be innovative, and from this theory, educational leaders must foster an innovative culture in their institutions, promoting experimentation, continuous learning, and collaboration among teaching and administrative staff (2016, p. 47).

Creativity in this context can be defined as the ability to apply divergent thinking and generate strategic alternatives in scenarios characterized by a lack of certainty. Consequently, educational leaders must foster tolerance for ambiguity within their respective teams, striving to ensure safe environments for the exchange of ideas and promoting the creative resolution of institutional challenges.

Through this creativity, leaders must guide the management of institutional change. This is how Bridges (2011) associates this work with the assimilation and strategic support of the transitions experienced by members of a group in response to the updating of practices, methodologies, and pedagogical approaches. This process analyzes how such transformations strengthen the organizational capacities necessary to respond to changes in the context (p. 66).

## Methodology

This research employs a qualitative, cross-sectional approach, analyzing the perceptions of school administrators at a single point in time to understand complex phenomena within their natural context. The study uses an observational design, which allows for the exploration of participants' experiences and meanings without manipulating environmental variables, thus facilitating a deeper understanding of the characteristics and realities of educational management.

The qualitative approach, as Creswell (2013) points out, is ideal for exploring complex phenomena in their natural context, capturing the perspectives of the participants and addressing issues of meaning and experience (p. 186). This theoretical foundation allows for a deep understanding of the perceptions and experiences of the five Colombian university presidents regarding the management of uncertainty in their strategic planning processes.

As mentioned in the abstract, this study was conducted with a purposive sample of five principals from public and private educational institutions in Colombia. Data were collected through semi-structured interviews consisting of 15 open-ended questions,

supplemented by a review of institutional documents such as the Annual Operating Plan (POA) and the Institutional Improvement Plan (PMI). Subsequently, the data were transcribed, coded, and thematically analyzed using ATLAS.ti software.

The study aimed to answer, essentially, the central question: how do administrators of public and private educational institutions manage uncertainty during their strategic planning processes? From this core question, the research branched out into three specific areas: first, what measures, strategies, and tools do administrators use to address uncertain situations, make decisions, and manage change? Second, how do they integrate elements such as mission values, available resources, innovation, and environmental opportunities and threats into their strategic planning? And third, what type of leadership do they exercise to motivate their teams, uphold institutional objectives, and adapt to changing scenarios? In other words, the article seeks to establish how the combination of risk analysis, organizational flexibility, effective communication, scenario planning, and strategic leadership allows administrators to respond to unpredictability without compromising continuity or educational quality.

Pre-intervention questions for university presidents (Uncertainty Management)

- Given that scenario planning is a fundamental technique in strategic planning, what measures has your institution taken to address uncertain situations?
- What strategies have allowed you to consider uncertainty in decision-making?
- What tools do you use to help your employees understand change management, aimed at achieving institutional goals?
- How do evaluation processes, the institutional improvement plan (PMI), and the annual operating plan (POA) contribute to mitigating the impact of uncertainty?
- What level of flexibility (high, medium, low) and agility do you consider your work team to have to adapt to unexpected changes?

Pre-intervention questions for the rectors (Strategic planning)

“Strategic planning is the ongoing process of making decisions regarding the characterization of long-term goals, the assessment of existing resources, and the development of tools and methodologies to achieve these goals” (David, 2019, p.49)

Category: *Strategic Planning (Planning components, Vision, Mission, philosophical platform, institutional objectives, goals, strategies, resources)*

- Does the organization incorporate its mission values when defining institutional objectives in strategic planning? Why?



- From your perspective, do you believe the educational institution has the necessary resources to achieve its proposed goals and objectives? Why?
- In the context of your educational institution's strategic planning, do you integrate innovation as a key element for addressing the changing challenges of the environment? Why?
- Can you mention creative strategies that have allowed for improved strategic planning in the educational institution?
- What external factors have the greatest impact on the functioning of the educational institution under your charge?
- What are the most relevant opportunities that your educational institution has at the moment (political, economic, social and environmental factors)?
- In your management role within the institution, what strategies have you implemented to address the uncertainties and threats in your environment?
- Of the external factors (political, social, economic, technological, environmental, legal), which have the greatest impact as a threat to your strategic planning?

Pre-intervention questions for principals (educational leadership)

Category: (*Transactional Leadership, Distributed Leadership in Educational Improvement, Ethical and Responsible Leadership*)

- Of the following leadership styles: ethical and responsible, distributed in educational improvements, transactional, transformational, adaptive, and strategic, which one do you identify with? Why?
- How do you inspire and motivate your team and the school community to achieve ambitious educational goals and objectives? And what kind of strategies do you use?

The research employed semi-structured interviews, characterized by:

Level of structuring: Regarding the level of structuring, the methodological design of the semi-structured interview allows for a technical balance between the use of predefined open-ended questions and the flexibility needed to explore emerging themes during the discursive interaction. This configuration is fundamental for addressing the dimensions of strategic planning and uncertainty management in depth, as it facilitates the capture of complex perceptions and experiences of school leaders that go beyond the initial script.

Flexibility in the questions: This section allowed for dynamic adjustments to the questions based on the situational context and the emerging narratives of the university presidents. This methodological versatility proved crucial in ensuring a thorough and detailed

exploration of the dimensions analyzed, facilitating the capture of in-depth perceptions and technical knowledge about strategic planning and uncertainty management in their institutions.

General approach: This section aimed to analyze and characterize the perceptions, experiences, and strategies implemented by school leaders regarding uncertainty management, strategic planning, and institutional leadership. This approach allowed for a deeper, qualitative understanding of the complex phenomena and patterns that define leadership practices in the face of the unpredictability of the educational environment.

### **Transcription and Encoding**

Transcription Process: The interviews were recorded and subsequently transcribed verbatim to ensure accuracy and preserve the nuances expressed by the participants.

The transcripts included not only the exact words, but also relevant pauses, emphasis, and emotional expressions that could contribute to the qualitative analysis.

### **Coding Process**

line-by-line analysis was performed , identifying key themes, concepts, and patterns in the responses.

Axial Coding: Similar codes were grouped into broader categories related to the main dimensions of the study, such as:

- Uncertainty management: Scenario planning, decision-making strategies, change management, adaptation.
- Strategic planning: Vision, mission, institutional objectives, resources, external factors and innovation.
- Educational leadership: Leadership styles (strategic, adaptive, ethical, distributed).

Selective Coding: In selective coding, systematic interconnections were established between emerging categories, allowing for the formulation of comprehensive, integrative constructs. This process resulted in the articulation of an interpretive framework that synthesizes the study's fundamental findings under two guiding principles: strategic planning as a tool for adapting to change and strategic leadership in the face of uncertainty. These overarching themes reflect the synthesis of managerial practice and its capacity for proactive response to the unpredictability of the institutional context.

## Sample

This research analyzed the strategies implemented by the principals of five Colombian educational institutions (both public and private) within the framework of uncertainty management in their strategic planning processes. A purposive sample of five school administrators was selected, a sample size that, under a qualitative approach, allowed for an in-depth understanding of their perceptions and experiences in their specific contexts. The participating institutions are located in various regions of the country, specifically in the departments of Valle del Cauca, Antioquia, Boyacá, and the Capital District of Bogotá. The process was carried out under criteria of confidentiality and informed consent, ensuring the voluntary participation of the principals. The educational institutions that participated in this research are described below:

**Table 1.** Matrix of Educational Institutions Under Study

Educational Institution	Location	Sector	Department
John XXIII	Urban	Official	Yumbo, Valle del Cauca
Usminia District	Urban	Official	Usme district, Bogotá
Father Ramón Arcila Ramírez	Urban	Private	Sabaneta, Antioquia
Sor Josefa del Castillo y Guevara Higher Normal School	Urban	Official	Chiquinquirá, Boyacá
Montessori School	Urban	Private	Cartagena, Bolívar

Note: Original work

## Instrument description

The instrument used for this research consisted of semi-structured interviews with five rectors of public and private educational institutions. This tool was selected to capture in-depth insights into their perceptions and experiences related to the study's key themes. The interviews were structured around a set of 15 open-ended questions that addressed diverse areas such as uncertainty management, strategic planning, and institutional leadership. To ensure the accuracy of the qualitative analysis, the interviews were recorded and transcribed

verbatim, preserving nuances and the participants' expressions. Finally, the data were processed using thematic analysis with the support of ATLAS.ti software .

### **Data collection techniques**

In keeping with the qualitative approach and observational design of this study, the primary data collection technique was the semi-structured interview, which allowed for a detailed understanding of each rector's experience. This tool was complemented by the analysis of institutional documents such as the annual operating plan (AOP) and the institutional improvement plan (IIP), which serve as official records of strategic management. Under this design, the research aimed to evaluate how the selected administrators manage uncertainty and promote planning processes focused on strengthening well-being and quality in their educational institutions.

## **Results**

The analysis of university presidents' perceptions regarding uncertainty management reveals significant findings across its various dimensions. This category includes fundamental subcategories such as scenario planning, strategic decision-making, change management, and adaptability. The findings derived from the survey are presented below.

Managing Uncertainty. Analysis of interviews with university presidents identified significant challenges in managing uncertainty, specifically in areas such as scenario planning, strategy development, decision-making, and change management . These challenges arise from the constant need to adapt institutional practices to sudden changes and the unpredictability of the educational environment.

Regarding the levels of flexibility and agility of institutional work teams in adapting to unexpected changes, the results show that 100% of managers (5 out of 5) identify organizational flexibility as a fundamental component in managing uncertainty. When characterizing this level, only 60% of those surveyed (3 out of 5) rated it as high, linking it to a positive evolution of the organizational culture and the systematic use of tools such as the Annual Operating Plan (AOP) and the Performance Management Index (PMI). The remaining 40% (2 out of 5) place agility at a medium level, arguing that, although there is a willingness to change, the speed of response is often limited by financial and technological constraints, factors that were critical during the pandemic.

A comprehensive approach demonstrates that the leaders adopt a systematic perspective in which various management tools converge to mitigate uncertainty.

In this context, the results demonstrate the importance of strategic operationalization through the articulation of the (POA), the systematic analysis of risks and the monitoring of quality indicators within the planning processes by scenarios.

Furthermore, a technical integration is observed that links the Institutional Educational Project (PEI) and the student handbook with qualitative dimensions of strategic leadership and motivation. This convergence suggests that change management is recognized as a multidimensional process that requires the integration of regulatory tools and managerial skills to guarantee the fulfillment of institutional objectives and educational quality.

**Strategic Planning** . The analysis of strategic planning reveals how managers systematically integrate the institution's core values to ensure coherence between its vision and daily practices. This strategic alignment aims to mitigate the fragmentation of community members, guaranteeing an institutional response linked to the local context and strengthening the social recognition of educational establishments. Furthermore, the results indicate that the subjective internalization of these values serves as a guiding framework for management, facilitating staff cohesion and the achievement of institutional objectives.

Regarding innovation, the analysis of the results demonstrates that university presidents integrate it as an essential strategic component to ensure that institutions evolve and maintain their competitiveness in the face of current challenges. The findings underscore that innovation facilitates the adoption of advanced technologies, which optimize interactive learning and bring agility to institutional communication and evaluation processes. In this context, it is evident that leaders promote a culture of experimentation and continuous learning, allowing academic methodologies and programs to be precisely adapted to the socioeconomic diversity and evolving expectations of the educational community.

These results clearly show that strategic managers use situational analysis to accurately categorize the factors that impact institutional planning. Key internal strengths include a dynamic organizational culture, a strong sense of belonging, and the implementation of process-based management.

However, critical weaknesses are also identified, such as a lack of financial and technological resources, coupled with limited teaching experience in virtual environments and external threats represented by cost competition, family migration, and disruptive events such as the Covid-19 pandemic. Consequently, according to Fullan (2014), this constant and

differentiated observation of the environment allows educational organizations to be guided towards positive and sustainable changes, facilitating, in some way, technical and proactive responses to the needs of the context .

In this sense, Lang (2023) highlights that a positive organizational culture promotes open communication channels among all participants, facilitating the exchange of ideas, feedback, and information necessary for effective strategic planning and the achievement of goals. (p. 82).

Through the analysis of the rectors' responses, a diversity of approaches and levels of maturity in the implementation of organizational practices can be observed.

A positive evolution in organizational culture is evident, emphasizing a defined command structure and respect for decisions made in committees, which has contributed to improved strategic planning. The importance of hierarchy and clarity in authority roles is recognized, enabling more efficient strategy execution.

Adaptability to change and continuous evaluation are practices that have improved educational outcomes. The ability to modify preventative measures and transform them into more effective strategies demonstrates a dynamic and responsive organizational culture.

It was evident that the five educational institutions of basic primary, secondary and high school education from the public and private sectors agree that education requires changes that lead to the improvement of the quality offered by educational institutions and that these results are reflected in better results in external tests (SABER).

This analysis highlights a preference for implementing process-based management. A strong emphasis on organization and attention to the identification and continuous improvement of educational processes is observed, reflecting a concern for efficiency and quality in the delivery of educational services.

In educational practice, the application of different management models is evident, with process-based management being the most prominent. School principals emphasize the importance of organizing educational activities systematically, identifying responsibilities, and ensuring compliance with established processes.

Although strategic management is not explicitly highlighted as the primary focus, there are indications of its presence in certain aspects of institutional management. For example, the importance of having a strategic approach to decision-making during difficult times is mentioned, as well as the use of tools such as the strategic planning matrix to monitor the institution's objectives and activities.

These practices suggest a recognition of the importance of long-term planning and the alignment of educational objectives with the vision and mission of institutions, fundamental elements of strategic management.

Educational leadership . The analysis of the findings in the educational leadership section allows us to distinguish between the perceptions of the administrators and the conclusions derived from the study. Regarding self-identified leadership style, the participants agree on the importance of strategic planning and well-founded decision-making for institutional direction. As textual evidence, the testimony of R1 stands out, who expresses their commitment to planning, effective communication, and the search for technical solutions to achieve specific goals. From the researcher's perspective, these positions corroborate that strategic leadership in the analyzed institutions is not an innate quality, but rather a technical competence that integrates rigorous analysis and a forward-looking vision to reduce the unpredictability of the environment.

From the perspective of school leaders, strategic leadership entails the ability to proactively adapt to the changes and challenges of the educational environment. This flexibility is reflected in the responses of school principals, who emphasize the importance of adjusting and responding effectively to environmental transformations. For example, the R3 (Regional Leadership 3) is primarily associated with adaptive and strategic leadership, highlighting the need to learn from past experiences and use that experience to address present and future challenges.

It is important to note that strategic leadership does not preclude the consideration of other leadership styles. On the contrary, many rectors recognize the importance of integrating different styles to adapt to the changing circumstances and challenges of the environment. This integration of leadership styles demonstrates a deep understanding of the complexity of educational leadership and the need for flexibility and adaptation to achieve success.

### **Summary of the categorical structure of the findings**

To organize the results derived from the qualitative analysis, Table 2 is presented, which integrates the main categories, emerging codes, and textual evidence that support the study. This matrix constitutes the interpretive framework for understanding how school leaders articulate strategic planning and leadership in the face of institutional uncertainty .

**Table 2.** Categorization matrix and evidence of qualitative findings

Main Category	Codes	Description	Related Quotes
Uncertainty Management	Scenario planning, Strategies, Decision making, Change management, Adapting to uncertainty	Strategies and skills used to deal with uncertainty, integrating tools such as PMI, POA and risk analysis.	Scenario planning has become a methodological approach to predicting and building a future (Schmalbach et al., 2010).
	Flexibility and agility in the team	Level of adaptation to unexpected changes.	It is necessary to establish clear processes to achieve adaptation to uncertainty.
Strategic Planning	Mission values, Resources, Innovation, Creative strategies, External factors, Opportunities and threats	Integration of mission values, strategic resources, and innovation in planning, considering external factors and opportunities in the environment.	Mission values ensure coherence between the institutional horizon and daily activities (Fabelo, 2017).
	Organizational culture	Positive impact on communication and goal achievement.	A positive organizational culture promotes open communication channels (Lang, 2023).
Educational Leadership	Strategic, Adaptive, Transformational, Ethical and	Focus on planning, informed decision-	Strategic leadership involves anticipating future needs and

	Responsible, Distributed Leadership	making, and adapting to challenges.	designing plans to address them effectively (Yukl, 2013).
	Inspiration and motivation	Strategies to motivate the school team to achieve goals.	Adaptive leadership highlights the importance of learning from past experiences (Avolio and Yammarino, 2013).
Challenges and Opportunities	Impact of the pandemic, Technological and financial resources, Socioeconomic diversity, Competition in school tuition	Obstacles and opportunities identified by the rectors, such as technological adaptation, diversity management, and competition with pension costs.	The Covid-19 pandemic overwhelmed the capacity to adapt to dynamic realities (Armengol, M. (2010); García et al., 2020).
	Transparency and accountability	Trust from the educational community and efficient use of resources.	They strengthen the confidence of the educational community in general, ensuring that resources are used efficiently.

Note: Created by the author using ATLAS.ti software

This systematic organization allows the identification of recurring patterns in the responses of the principals, facilitating the understanding of management practices in contexts of unpredictability .

The findings revealed that uncertainty management is not an improvised process, but rather a combination of risk analysis, organizational flexibility, and effective communication.

One hundred percent of managers recognized flexibility as a key factor; of these, 60% rated it as high and 40% as medium, the latter conditioned by technological and financial limitations. Furthermore, a close relationship was identified between scenario planning, the use of tools such as the Annual Operating Plan (AOP) and the Performance Management Index (PMI), strategic leadership, and the institution's capacity for adaptation.

Interpretation and implications of the findings. These results suggest that managerial effectiveness depends on a flexible organizational structure, supported by strategic leadership, a positive organizational culture, and continuous evaluation. Consequently, the study suggests that educational institutions strengthen their continuity, responsiveness, and quality when they integrate forward-looking planning, clear communication, and innovation into their management processes.

### **Relevant direct quotes**

Uncertainty management: “Scenario planning allows us to anticipate and make decisions with greater certainty in the midst of uncertainty” (R5).

Strategic planning: “Incorporating mission values is key to ensuring that our goals reflect our institutional identity” (R4).

Strategic leadership: “Adaptive leadership involves constantly adjusting our strategies to respond to the challenges we face” (R3).

### **Discussion**

In managing uncertainty, the discussion of the findings reveals that school leaders validate the effectiveness of scenario planning as a key element in building institutional resilience. This stance goes beyond mere operational efficiency, aligning with Schmalbach's (2010) perspective, who identifies this method as a way to proactively construct possible futures in the face of environmental unpredictability.

Similarly, the use of diverse decision-making and change management strategies reflects a robust technical capacity to mitigate negative effects, an aspect that Cameron and Quinn (2016) consider essential for the survival and health of organizational culture. Unlike rigid management models, the university presidents consulted prioritize a long-term strategic vision (projected toward years such as 2026, 2029, and 2032) that ensures adaptation to the demands of the local context. This strategic alignment not only facilitates the administrative

response but, in accordance with the approaches of Cardona (2012) and Yukl (2013), ensures that the institutional horizon responds appropriately to social needs, strengthening social recognition and the quality standards of educational institutions.

The critical integration of the findings allows this theory to be expanded by demonstrating that, in Colombian management practice, planning does not work in isolation; on the contrary, its effectiveness depends on the combination of risk analysis, organizational flexibility and effective communication.

The research fully confirms the proposed hypothesis, demonstrating that managing uncertainty in Colombian educational institutions is not a random process, but rather a structured technical response. This empirical support rests on the convergence of three fundamental dimensions: systematic risk analysis, organizational flexibility, and the deployment of effective communication strategies. Within this framework, school administrators validate the efficiency of scenario planning as a key element in building institutional resilience, transcending mere operational efficiency to become a tool for proactively constructing possible futures in the face of unpredictability. This perspective aligns with the arguments of Schmalbach (2010), who identifies this method as a crucial way to mitigate the lack of control in chaotic environments.

The dimensions that showed the greatest strength in verifying the hypothesis are:

- Technical operationalization: the use of the annual operating plan (POA) and the institutional improvement plan (PMI), which are described by the rectors as the indispensable institutional DNA to achieve adaptation.
- The forward-looking vision: the emphasis on long-term strategic planning (with projections to 2026, 2029 and 2032), which allows institutions to prioritize adaptation to the demands of the local context over rigid management models.
- Mitigating negative effects: the use of robust technical capabilities for decision-making, which is essential for the survival and health of the organizational culture in the face of changing challenges.

The validation of the hypothesis becomes especially evident in the face of extreme disruptive events, such as the Covid-19 pandemic, where the combination of defined processes and the capacity for adjustment ensured educational continuity. Consequently, the findings not only confirm the existing theory but also expand upon it by demonstrating that

the effectiveness of planning depends on a flexible organizational structure that integrates risk analysis with assertive communication to strengthen institutional quality.

Furthermore, managerial adaptability is a determining factor in preserving organizational effectiveness and academic quality in the face of an unpredictable environment. The results underscore that the implementation of defined processes and continuous evaluation are consistent with the evaluation phases proposed by Thompson and Strickland (2020), an essential outcome for strengthening institutional resilience. This dynamic aligns with Kotter's (2011) theory of change management, demonstrating that the systematic updating of practices and operational plans is imperative for the stability of educational institutions.

Ultimately, the study represents a novel contribution by empirically validating that the integration of flexibility with tools such as the PMI and the POA generates comprehensive and proactive planning routes, which ensure educational continuity in the face of disruptive events.

School leaders emphasize the systematic integration of core values to ensure coherence between the institution's vision and daily practice. This strategic alignment, framed within ethical and responsible leadership, allows values to serve as a guiding principle that motivates individual behavior and prevents fragmented actions within the organization. According to Fabelo (2017), this axiological cohesion is fundamental to ensuring that goals faithfully reflect the institution's identity, which, according to the findings of this study, strengthens social recognition and the trust of the educational community by fostering a perception of transparent management aligned with the local context. Similarly, the incorporation of innovation and the prospective analysis of external factors (opportunities and threats) emerge as essential components of scenario planning to mitigate risks and ensure the holistic well-being of students in volatile educational environments.

Uncertainty management, strategic planning, and strategic leadership form an interdependent system underpinned by organizational culture, where weakness in one affects the effectiveness of the others in ensuring educational quality. Strategic leadership acts as the driving force of the process, enabling managers to anticipate needs and design responses to changing contexts. Strategic planning serves as the instrument that operationalizes this leadership through flexible processes, risk analysis, and scenario planning, materialized in tools such as the Annual Operating Plan (AOP) and the Institutional Improvement Plan (IIP). In turn, uncertainty management is geared toward channeling unpredictability and leveraging

it as an opportunity for organizational learning. All of this unfolds within a robust organizational culture that fosters communication, a sense of belonging, and the institution's capacity for adaptation to complex contexts.

Finally, the consolidation of a positive organizational culture and the implementation of process-based management, in synergy with strategic leadership, constitute key pillars for governing uncertainty. This technical integration enables a resilient institutional response, validating the arguments of Madzimure and Mashishi (2021), who maintain that strategic management is imperative for monitoring and evaluation, as it reduces ambiguity and enhances the organization's capacity to monitor strategic interests. In terms of its contributions, this research transcends operational description by proposing comprehensive and proactive planning pathways that guarantee educational continuity and institutional quality in the face of disruptive events. As a reflective conclusion, the study demonstrates that the stability of educational institutions does not depend on eliminating the unforeseen, but rather on a flexible organizational architecture that integrates risk analysis with effective communication, transforming uncertainty into a catalyst for institutional strengthening and innovation.

## Conclusions

Research conducted in public and private sector institutions concluded that managing unpredictability is based on a triad: risk analysis, organizational flexibility, and effective communication. These findings fully confirm the initial hypothesis, demonstrating that school administrators mitigate the lack of control through the technical use of tools such as the Annual Operating Plan (AOP) and the Institutional Improvement Plan (IIP), elements that serve as the primary axis for institutional adaptation. The study highlights that effective leadership lies in strategic and adaptive leadership with a forward-looking vision, which ensures educational continuity and institutional quality in the face of changing challenges and disruptive events. This allows for transforming uncertainty into an opportunity for strengthening and pedagogical innovation.

The key findings of this study stem from a systematic analysis that confirms the research hypothesis, which posits that managers handle unpredictability by integrating risk analysis, organizational flexibility, and effective communication. In the category of uncertainty management (scenario planning, strategies, decision-making, and change management), the study confirms that university leaders implement structured planning that

incorporates the use of risk matrices and institutional assessments to mitigate the lack of control over outcomes.

The distinctive contribution of this work to scientific knowledge lies in the identification of comprehensive and proactive planning routes, which allow us to transcend reactive management and take advantage of uncertainty as a pedagogical tool for institutional strengthening.

Unlike other management contexts, these Colombian leaders demonstrate adaptive and strategic leadership, using instruments such as the POA and the PMI as the DNA of the educational community, allowing them to project long-term goals and ensure educational continuity in the face of disruptive crises such as the Covid-19 pandemic.

The adoption of long-term strategic plans, based on scenario analysis and the systematic review of institutional instruments, guarantees the effectiveness and relevance of academic and administrative management. This forward-looking framework allows educational institutions to assimilate emerging needs, ensuring a flexible and proactive response that mitigates the effects of uncertainty.

Scenario planning in the analyzed educational institutions transcends mere operational description, becoming a long-term prospective design. This methodology, based on systematic reviews and dynamic adjustments, allows for a deep understanding of the volatility of the socioeconomic environment. The findings of this research are empirically validated by demonstrating that forecasting not only mitigates the lack of control but also functions as a technical resource for constructing possible futures. In this context, the synergy between collaborative participation and assertive communication stands as a pillar of organizational resilience, enabling the institutional response to be organic rather than reactive.

The research findings demonstrate that periodic evaluations are a crucial strategic tool for mitigating uncertainty in the analyzed management centers. It was established that effective management practices extend beyond simply assessing human talent—faculty, students, and administrative staff—by integrating a systematic analysis of institutional processes. This allows for the timely identification and implementation of operational adjustments. This dynamic lends flexibility to institutional planning and management tools, transforming them into mechanisms for assertive responses that ensure continuous improvement and stability in the face of an unpredictable environment.

Regarding strategic planning, the findings demonstrate that the integration of core values transcends mere documentation to become the central axis that shapes daily practice. This axiological alignment allows institutions to establish limits of tolerance and offer relevant responses to the demands of the social environment. Far from being static structures, these principles act as a guiding framework that strengthens the institutional profile and ensures the convergence of efforts toward common goals.

Regarding the dimension of strategic innovation, the analysis of the findings reveals that it constitutes a fundamental driver for the evolution and competitiveness of institutions in the face of the volatility of the current educational environment. The empirical data of the study suggest that the integration of advanced technologies transcends mere digitization, facilitating interactive learning environments and strengthening communicative and evaluative agility within management. However, the research offers a critical perspective by identifying that disruptive events, such as the Covid-19 pandemic, highlighted significant gaps in technological resources and teacher training, especially in the public sector, which underscores the urgency of incorporating innovation as a cross-cutting theme in planning. Consequently, this work validates innovation as one of the paths to comprehensive and proactive planning that allows institutional leaders to transform external threats into opportunities for continuous improvement, ensuring the relevance of the service to the emerging needs of students and their families.

Regarding external factors, the socioeconomic diversity of the environment is leveraged as a strategic opportunity to reflect on academic programs and support methodologies. This contextual responsiveness, enhanced by strategic alliances, guarantees educational relevance and inclusion in the face of the specific demands and needs of the social community.

In Internal Factors. Organizational flexibility and a sense of belonging constitute the fundamental pillars of a dynamic and responsive organizational culture.

These traits do not operate in isolation; rather, they translate into open communication channels and a strengthened respect for leadership structures and committee decision-making processes, thus ensuring the efficient execution of designed strategies. Similarly, the study demonstrates that this strength in the internal culture fosters teamwork and ongoing dialogue, transforming adaptability into an indispensable resource for ensuring proper institutional functioning and continuous improvement.

## **Contributions to future lines of research**

The findings of this study on uncertainty management, strategic planning, and educational leadership lay the foundation for various academic and practical developments.

The following lines are proposed to deepen knowledge of the area.

Resilience strategies in the face of uncertainty in educational contexts: analyzing how leaders identify and assimilate disruptive changes such as policy fluctuations or technological advances to strengthen organizational resilience without compromising educational quality.

Agile planning models in dynamic environments: designing and validating "rapid adaptation" planning models that integrate the flexibility needed to respond to volatile situations in the school environment.

Developing competencies in educational leadership for crisis management: Identifying key competencies for leading in crisis contexts constitutes a potential line of future research, aimed at deepening the training of educational leaders and the design of pedagogical and administrative strategies that allow the development of these capacities in teacher and management training programs.

Ethics and social responsibility in decision-making: exploring the axiological frameworks and ethical challenges faced by leaders when prioritizing the well-being of the educational community in scenarios of high uncertainty.

Correlation between leadership and academic performance: conduct studies that link leadership with academic results (Saber tests) and the adaptation of students to new technological tools.

Each of these lines has the potential to improve the understanding of how educational environments can adapt and thrive in the face of uncertainty, thus contributing to more resilient and innovative educational policies.

## **Limitations and scope of the study**

It is essential to acknowledge the limitations of this research to contextualize its scope. The study focused on a qualitative sample of five university presidents in Colombia, which suggests the need for complementary quantitative studies to generalize the observed trends. Furthermore, significant gaps in financial and technological resources were identified, particularly in the public sector, which limit the capacity for immediate response. Therefore, the development of international comparative studies and longitudinal studies is

recommended to verify the long-term sustainability of the comprehensive planning strategies (projected for 2026-2032).

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