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Governance and Organisational Innovation as Drivers of Educational Quality: A PLS-SEM Analysis of the Moroccan Education System

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Abstract

Background: Despite various reform efforts, the Moroccan education system continues to encounter persistent structural challenges. In a global landscape that demands enhanced educational performance and quality, the specific roles of governance and organisational innovation remain underexplored, particularly in developing nations.

Objective: This study investigates the impact of governance and organisational innovation on the performance and perceived quality of Morocco's education system. It specifically examines the mediating role of system performance in the relationship between governance, innovation, and quality.

Methodology: A structured questionnaire utilising a Likert scale was administered to 223 teachers across various educational levels and regions in Morocco. Data analysis was

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conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) via SmartPLS to evaluate construct validity, measurement reliability, and structural relationships.

Results: The findings indicate that governance exerts a significant direct effect on system performance, which subsequently influences perceived quality. Organisational innovation was found to contribute indirectly to quality by strengthening governance frameworks and, by extension, enhancing system performance. The results underscore the critical importance of mediating effects in successful educational transformation.

Conclusion: Educational performance and quality are determined by interdependent factors where governance serves as the primary driver of improvement. While the impact of organisational innovation is indirect, it remains vital for fostering the effective governance necessary for high-quality educational outcomes.

Unique Contribution: This research provides an integrated theoretical framework demonstrating how governance and innovation collectively influence educational quality through the lens of system performance. These insights offer a scalable model for other developing countries facing similar structural educational hurdles.

Key Recommendation: Policymakers should institutionalise innovative governance practices, including digitalisation, enhanced stakeholder participation, and robust change management. Furthermore, the study suggests supporting local-level experimentation and continuous professional training to ensure sustained improvements in educational quality.

Keywords: governance, organisational innovation, educational performance, SEM, educational quality.

Introduction

The transformation of contemporary educational systems increasingly relies on two strategic levers: governance and organisational innovation. These dimensions, now central to educational policies, are recognised for their ability to strengthen system performance and sustainably improve the quality of education (Leithwood et al., 2020). Educational governance, as a mechanism for steering, coordination, and evaluation, shapes the coherence of public action and the capacity of institutions to meet assigned objectives. Organisational innovation, on the other hand, involves introducing new management practices, structures, and operational methods to enhance system efficiency.

According to recent OECD orientations (2023), the ability of educational systems to adapt and transform depends largely on the presence of coherent digital ecosystems and adaptive governance mechanisms. In the MENA region, innovation is also increasingly viewed as a strategic response to persistent weaknesses, helping to reduce inequalities, modernise educational processes, and improve learning outcomes.

In Morocco, these concerns have been at the core of major reform efforts over the past two decades. The Strategic Vision 2015–2030 emphasises the importance of governance and innovation in improving system efficiency. Recent initiatives, such as the Pioneer Schools Program (2023) and major World Bank–supported university governance projects, reflect this

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orientation. These efforts have led to notable improvements in performance indicators such as student learning outcomes, retention, and institutional steering, but the overall perceived quality remains limited, and results vary significantly.

However, existing literature still does not fully capture how these two levers of governance and organisational innovation interact, nor how they jointly influence system performance and, indirectly, the perceived quality of education. In particular, the mediating role of system performance in this relationship remains underexplored in empirical studies, especially in developing countries (OECD, 2019).

The central research question guiding this study is: To what extent does the performance of educational systems mediate the relationship between governance and organisational innovation in the overall performance and quality of these systems?

In response to this question, the study pursues two main objectives. First, it aims to analyse the direct effects of governance and organisational innovation on the performance of the Moroccan educational system. Second, it seeks to determine the extent to which the educational system's performance functions as a mediating variable in the combined influence of these two strategic levers on the perceived quality of education.

The scientific contribution of this study lies in the development of an integrated explanatory model based on empirical data that sheds light on the dynamics of systemic educational transformation in middle-income countries such as Morocco and, more broadly, in the MENA region.

This article is structured in three main sections: The first presents the conceptual framework covering the study's four key variables. The second outlines the methodology, based on partial least squares structural equation modelling (PLS-SEM). The third section presents and discusses the empirical results, followed by conclusions, limitations, and suggestions for future research.

Literature Review

The Structuring Role of Governance in Educational Performance

Educational governance plays a decisive role in improving system performance by directing policy implementation, allocating resources, and ensuring stakeholder accountability. Effective governance models rely on a balance between central regulation and local autonomy, enabling policies to be adapted to territorial specificities while preserving the overall coherence of the system (Leithwood et al., 2020). When decision-making processes are shared, transparent, and grounded in collaborative steering mechanisms, educational institutions are better positioned to achieve their pedagogical and organisational objectives. The ability of an education system to efficiently mobilise its human and material resources is closely linked to the quality of its governance structures, particularly when decisions are data-informed and aimed at the continuous improvement of practices (Radinger et al., 2023). Evidence from the most high-performing countries further shows that successful reforms are systematically accompanied by strengthened governance, based on professional leadership, local actor accountability, and a strong culture of shared responsibility (Schleicher, 2022).

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Based on this, the following hypothesis is proposed:

H1. Educational systems perform significantly better when governance is effective.

Organisational Innovation as a Driver of Governance Improvement

Organisational innovation, when grounded in a culture of trust, participatory leadership, and digital integration, serves as a strategic lever capable of profoundly transforming governance mechanisms within higher education institutions. By delegating digital transformation responsibilities to teaching teams and establishing horizontal decision-making structures, university leaders create a climate of experimentation and accountability that strengthens the efficiency and transparency of governance processes (Laufer, 2025). This dynamic, by fostering more collaborative and adaptable governance, also lays the groundwork for the emergence of innovative practices that can sustainably support the performance and quality of education systems. Assessing and monitoring the culture of innovation within educational institutions thus provides valuable insights into how innovation-friendly environments encourage the adoption of more adaptive and transparent governance practices (OECD, 2023). Furthermore, the effective governance of innovation in education systems must be based on models that combine professionalism, institutional trust, and horizontal accountability (Cerna, 2024). Such approaches signal a shift toward institutions where governance is driven by the collective capacity to innovate, learn, and adapt, rather than by top-down regulatory mechanisms.

Based on this, the following hypothesis is proposed:

H2. Organisational innovation positively affects governance.

Educational Performance as a Determinant of System Quality

The perceived quality of an education system largely depends on its ability to deliver measurable outcomes in learning, skill development, and student satisfaction, which directly shape users' overall evaluation of the system. High academic performance, combined with a stimulating learning environment and teaching regarded as effective, strengthens this perception, particularly when students' fundamental psychological needs autonomy, competence, and social relatedness are fulfilled (Jadrić et al., 2025). This mechanism is also evident in contexts where individualised teaching practices, constructive feedback, and curricular coherence serve as key levers of quality, especially when performance levels are already high (Engida, 2024). Students' lived experiences, including their achievements, the resources provided, and the institutional support received, directly influence their judgment of system quality (Chellaiyan, 2023). Thus, educational performance is not merely a quantitative indicator of success but a structuring factor of legitimacy, institutional recognition, and user trust in the system's value and effectiveness.

Accordingly, the following hypothesis is proposed:

H3. Educational performance positively impacts the perceived quality of the system.

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Educational Performance as a Mediating Channel Between Governance and System Quality

Educational performance now stands out as a central mediator linking governance reforms to overall improvements in education systems. The emphasis on objectively measurable learning outcomes, the development of teacher competencies, and equitable access supports the view that the impact of governance policies is primarily realised through performance gains (Schildkamp et al., 2023). When school leadership, learning assessment, and institutional governance are closely aligned, education systems experience significant improvements in perceived quality, driven by enhanced student performance and reduced learning disparities (Huang et al., 2024). Educational performance thus emerges as the primary channel through which strategic orientations and systemic policies translate into tangible, observable improvements in quality, benefiting all stakeholders. Based on this, the following hypothesis is proposed:

H4. System quality can be indirectly influenced by governance through improvements in educational performance.

Research Methodology

The methodological approach implemented in this study is detailed in the following section

Study Design

This research adopts a quantitative approach to examine the influence of governance and organisational innovation on the performance and quality of educational systems, with a particular focus on the mediating effects of educational performance. Structural Equation Modelling (SEM) was chosen because it allows the simultaneous modelling of complex relationships among latent variables, accounting for both direct and indirect effects and measurement error. This approach is particularly well-suited for studying multidimensional concepts such as educational governance, organisational innovation, and educational system quality.

Population of the Study

The target population of this study consists of teachers working across various levels and types of educational institutions in Morocco. Participants come from multiple regions, reflecting a diversity of socio-economic and institutional contexts. The respondents include teachers from primary, secondary, technical, and higher education, thus covering all educational levels.

Sample Size and Sampling Technique

A total of 223 teachers were retained for analysis, in accordance with methodological recommendations for studies using SEM, which suggest a minimum of 200 observations or at least 10 cases per variable to ensure statistical robustness. A multistage sampling technique was applied, combining the selection of representative educational institutions in major Moroccan regions with the random selection of teachers within those institutions. This method yielded a diverse and balanced sample, reflecting both the geographical and professional diversity of the teaching workforce.

Instrument for Data Collection

Data were collected using a structured questionnaire comprising several sections designed to measure governance, organisational innovation, educational performance, and the perceived quality of the educational system. Items were assessed on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.” The questionnaire also collected sociodemographic

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information, including age, gender, teaching level, professional experience, and region. The measurement scales were adapted from well-established works in the literature

Reliability and Validity

The reliability of the instrument was assessed using Cronbach's alpha and composite reliability. The results indicated satisfactory internal consistency for all dimensions, with values exceeding 0.70. Convergent validity was tested through confirmatory factor analysis, confirming that the average variance extracted (AVE) for each construct exceeded the 0.50 threshold. Discriminant validity was verified using the HTMT criterion, confirming that the constructs were empirically distinct.

Method of Data Analysis

Data analysis was conducted using SmartPLS 4, which is particularly suited to small- to medium-sized sample sizes and complex models, including mediating effects. The analysis was carried out in two stages: (1) evaluation of the measurement model to confirm the validity and reliability of the constructs, and (2) evaluation of the structural model to test the hypothesised relationships between governance, organisational innovation, educational performance, and educational system quality. Key criteria included path coefficients, explained variance (R^2), AVE, and HTMT.

Results

Demographic information's

The study sample consists of 223 Moroccan teachers, distributed by age, teaching level, professional experience, and region, ensuring representativeness for analysing the impact of governance and organisational innovation on the performance and quality of the education system. The 26–35 age group is the most represented (31.1%), followed by those aged 36–45 (25.7%) and 46–55 (24.3%), while teachers aged 18–25 (13.5%) and over 55 (5.4%) are less numerous. Secondary school teachers dominate the sample (68.9%), ahead of primary school teachers (17.6%), higher education teachers (8.1%), and technical education teachers (5.4%). In terms of professional experience, 39.2% have over 20 years of service, 24.3% between 6 and 10 years, and 14.9% between 11 and 20 years. Regionally, the sample notably covers Oriental (18.9%), Souss-Massa (17.6%), Fès-Meknès (12.2%), and Casablanca-Settat (9.5%), reflecting the country's territorial and socio-economic diversity. This varied composition allows for a robust and generalizable analysis.

PLS-SEM Analysis

To understand the connection between governance, organisational innovation, performance, and the quality of educational systems, it is necessary to first define the variables used in this study. Each variable was chosen with great care and gauged using scales slightly modified from earlier studies that had been successful in the field.

Variables and measurement instruments adopted

The variables in this study were measured using validated scales derived from established research, ensuring both a solid theoretical foundation and methodological rigour. Governance was operationalised through four indicators reflecting key dimensions of institutional management: organisational adaptability (FO1), encouragement of innovation (FO2), team restructuring (FO3), and the production of performance reports (TR2). Organisational innovation was assessed through the capacity to adapt to change (INST1), the monitoring of emerging trends (INST2), and the testing and implementation of new practices (INCOP1). The quality of the education system was measured through the integration of new pedagogical approaches (QI1), the promotion of adaptive development

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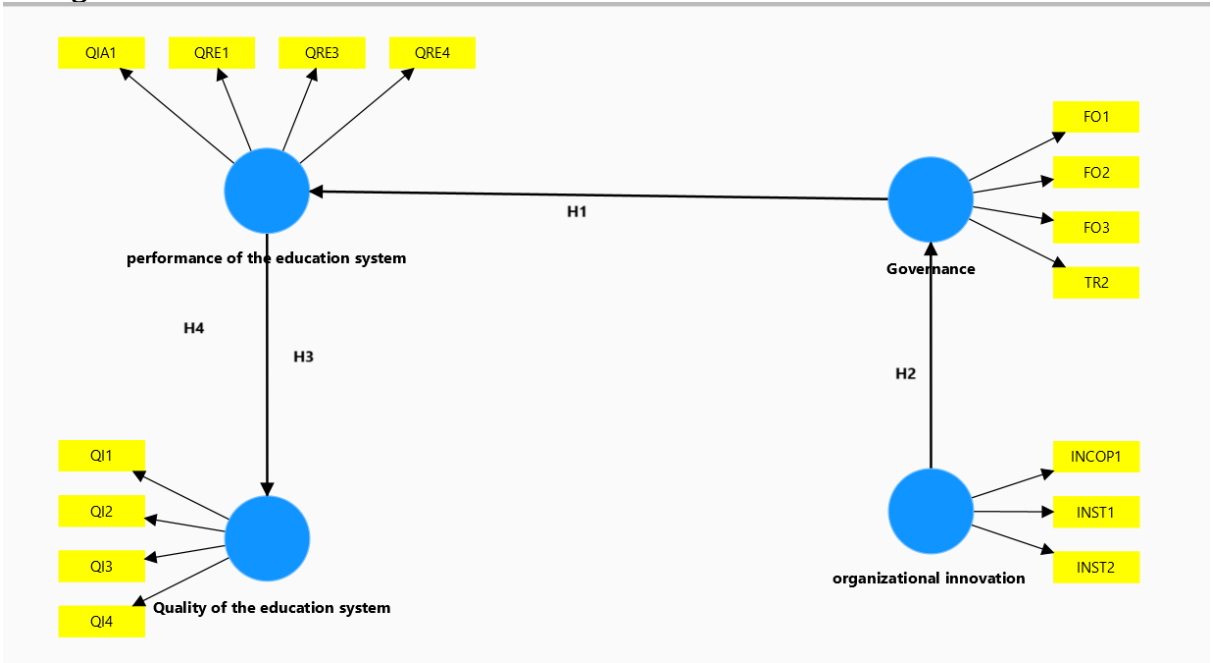
(QI2), the fostering of educational innovation (QI3), and the capacity to respond effectively to emerging challenges (QI4). Likewise, the performance of the education system was evaluated through its ability to provide holistic education (QIA1), ensure effective learner preparation (QRE1), contribute to the development of responsible citizens (QRE3), and promote student success (QRE4). At this stage, the conceptual model has been structured around hypotheses linking these constructs, which will be empirically tested in the subsequent analysis, as illustrated in the diagram below.

Figure 1: Path model



Note. Developed by the authors.

Evaluation/Analysis PLS-SEM

The outer loadings analysis in SmartPLS indicates that all indicators reliably measure their respective constructs, with strong correlations to the associated latent variables. For Governance, loadings range from 0.727 to 0.756, including 0.744 for TR2, all above the 0.7 threshold, confirming FO1, FO2, FO3, and TR2 as valid measures. Organisational Innovation shows loadings from 0.792 to 0.842, confirming the robustness of INCOP1, INST1, and INST2. The Quality of the Education System has loadings between 0.734 and 0.87; while some values are near the minimum threshold (0.734, 0.743), they remain acceptable, and indicators like QI3 (0.87) contribute strongly. For Performance of the Education System, loadings ranging from 0.744 to 0.775 confirm that QIA1, QRE1, QRE3, and QRE4 are effective measures of the construct.

Construct reliability and validity

Table 2 :Construct reliability and validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)

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Governance	0,728	0,73	0,83	0,549
The quality of the education system...	0,796	0,813	0,866	0,62
organizational innovation	0,748	0,768	0,854	0,661
The performance of the education system	0,751	0,752	0,842	0,572

Note. Developed by the authors.

The assessment of reliability and convergent validity confirmed that all constructs met the required psychometric standards. Cronbach's alpha values for each construct exceeded the recommended threshold of 0.70, indicating a satisfactory level of internal consistency. Similarly, composite reliability scores ranged from 0.83 to 0.866, surpassing the minimum criterion of 0.70 and thus confirming the accuracy and stability of the measurement model. The Average Variance Extracted (AVE) values, ranging from 0.549 to 0.661, further demonstrated the model's adequate capacity to capture the variance explained by the observed indicators. Taken together, these results confirm that the constructs under investigation, governance, quality of the educational system, organisational innovation, and educational performance, are measured with both reliability and validity, ensuring the robustness of subsequent structural analyses.

Discriminant validity

HTMT results generally confirm the model's discriminant validity, with all values below the 0.85 threshold indicating distinct constructs. For example, the HTMT between Quality of the Education System and Governance is 0.334, between Organisational Innovation and Governance is 0.59, and between Organisational Innovation and Quality is 0.376, all well within acceptable limits. The value between Performance of the Education System and Governance is 0.852, close to the threshold and suggesting possible overlap. Other values, such as 0.531 between Performance and Quality and 0.409 between Performance and Organisational Innovation, remain comfortably below the limit. Overall, the results support discriminant validity, except for the Governance–Performance relationship, which may need further examination.

Collinearity statistics (VIF)

The Variance Inflation Factor (VIF) analysis shows no multicollinearity concerns, with all values well below the threshold of 5, ranging from 1.241 to 2.311. Governance indicators (FO1, FO2, FO3, TR2) have VIFs between 1.241 and 1.532, while Organisational Innovation indicators (INCOP1, INST1, INST2) range from 1.422 to 1.554. For the Quality of the Education System, the highest VIF is 2.311 (QI3), still acceptable, and the Performance of the Education System indicators (QIA1, QRE1, QRE3, QRE4) range from 1.386 to 1.548. These results confirm the absence of problematic collinearity, supporting the model's robustness and interpretability.

Analysis of Inner Model Correlations and Descriptive Statistics

The inner model correlation matrix shows very weak relationships between the main latent variables: governance has negligible negative correlations with both educational performance ($r = –0.021$) and quality ($r = –0.078$), while performance and quality are virtually uncorrelated ($r = –0.003$). This absence of substantial direct linear associations supports the need to estimate path coefficients and test their significance through bootstrapping. Latent variable scores are centred around zero, meeting PLS-SEM mean-centring requirements. Skewness and kurtosis indicate near-symmetry for governance (skewness = –0.005) and performance (0.084), while

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quality shows slight positive skewness (0.508) and moderate excess kurtosis (0.520). The Cramér–von Mises normality test yields p-values below 5% for all constructs ($p < 0.05$), confirming that the latent score distributions are non-normal and justifying the use of PLS-SEM, which does not assume multivariate normality.

Path coefficients

Except for the link between educational performance and governance, which requires particular attention, the model shows strong discriminant validity, and the path coefficients clearly indicate the magnitude and direction of relationships. Governance has a high positive effect on performance ($\beta = 0.639$), confirming Hypothesis 1 and suggesting that better governance quickly translates into significant improvements in system functioning and outcomes. Organisational innovation positively influences governance ($\beta = 0.453$), supporting Hypothesis 2 and indicating that innovative practices, structures, and processes enhance governance effectiveness, though with a smaller effect size than governance on performance. Educational performance positively affects quality ($\beta = 0.418$), validating Hypothesis 3 and indicating that regular evaluations, such as student assessments or higher-education indicators, improve overall quality. Finally, governance indirectly influences quality through its impact on performance, confirming Hypothesis 4 and demonstrating that effective governance not only strengthens performance directly but also raises perceived quality via improved academic outcomes.

Indirect effects and Specific indirect effects

The analysis of indirect and total effects highlights mediation relationships among the constructs, offering a deeper understanding of the mechanisms by which variables exert their influence beyond direct effects. Governance demonstrates an indirect effect of 0.267 on the quality of the education system, indicating that it contributes to quality improvement primarily through its positive impact on system performance, a result consistent with direct effect observations and confirming Hypothesis 4 that governance can indirectly influence quality by enhancing student outcomes, while also reaffirming the essential role of educational performance in this process as outlined in Hypothesis 3. In terms of total effects, governance exerts a strong influence of 0.639 on educational performance and a moderate yet meaningful effect of 0.267 on system quality, with the latter impact largely mediated by performance, thereby validating Hypothesis 1 that effective governance leads to better-performing education systems. Organizational innovation emerges as another key driver, with a total effect of 0.453 on governance, confirming Hypothesis 2 and emphasizing that the introduction of innovative practices, processes, and structures strengthens governance capacities; it also indirectly affects system quality with a total effect of 0.121, mainly through the sequential mediation of governance and performance, and contributes 0.29 to system performance, underscoring its indirect but significant role in improving educational outcomes. Specific mediation analysis shows that the influence of organizational innovation on quality through governance and performance (0.121) follows the logical sequence H2 → H1 → H3, while its impact on performance through governance (0.29) further demonstrates that enhanced governance practices act as a critical transmission channel for innovation to translate into improved outcomes. Similarly, the indirect effect of governance on quality via performance (0.267) confirms that the primary pathway from governance to perceived quality operates through performance gains, reinforcing Hypothesis 4. Overall, these findings reveal that governance and organizational innovation exert both direct and indirect influences on system performance and quality, with educational performance emerging as the central mediator linking governance and innovation to improved quality, thereby underscoring the interdependence of these

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constructs and the necessity of systemic improvements across governance and innovation to achieve high-performing and high-quality education systems (H1, H2, H3, H4).

R-square

The analysis of the R-squared (R^2) and f-squared (f^2) values provides essential insights into the model's explanatory power and the strength of relationships among constructs. The R^2 value for governance is 0.205, indicating that organisational innovation accounts for 20.5% of its variance; although this level of explanation is moderate, it confirms Hypothesis 2 by demonstrating that innovation within organisations contributes meaningfully to governance, while also suggesting that additional, unmodeled factors may influence this dimension. For the quality of the education system, the R^2 reaches 0.175, meaning that 17.5% of its variance is explained by educational performance and other predictors; despite being relatively modest, this proportion remains statistically relevant and supports Hypothesis 4 by showing that improvements in performance, often driven by governance, positively affect perceived quality. By contrast, the R^2 for educational performance is 0.408, revealing that governance alone explains 40.8% of its variance, which represents a substantial explanatory power and provides strong empirical support for Hypothesis 1, confirming that systems perform significantly better under effective governance. This result further reinforces earlier interpretations of the path coefficients, underlining the central role of governance in shaping educational outcomes, while the overall distribution of R^2 values suggests a differentiated but coherent pattern of influence across the model's constructs.

Discussion

The results of this study show that governance has a direct and significant effect on organisational innovation within the education system, suggesting that strengthening governance practices is a key lever for fostering managerial innovation dynamics. This conclusion is consistent with Maroy (2017), who highlights that participatory governance and the empowerment of frontline actors are powerful drivers of modernisation in educational structures. In the same vein, Anderson and Kumari (2022) emphasise that integrating collaborative practices and shared leadership enhances organisations' ability to adapt to the challenges of the 21st century. This observation aligns with Fullan's (2021) perspective that promoting a culture of change, supported by transformational leadership, is essential for stimulating innovation in schools. This view is further supported by Arundel et al. (2019), who stress the central role of managerial innovation in improving the flexibility and resilience of education systems, particularly in complex environments. Similarly, Schleicher (2018), drawing on OECD analyses, emphasises that high-performing education systems combine decentralised governance, professional autonomy, and continuous evaluation to foster organisational learning. Likewise, Lemoine and Wirtz (2020) note that educational performance largely depends on institutions' ability to translate strategic orientations into concrete, operational innovations. Finally, Adile and Alaoui (2024) demonstrate that organisational learning acts as a catalyst, transforming governance practices into performance gains through the capitalisation of experience and the continuous renewal of working methods.

This research addresses a significant gap in the literature, still rare in the Global South, by providing robust empirical evidence of the critical mediating role of organisational innovation in the relationship between governance and educational performance. The observed indirect effect is both strong and statistically significant, indicating that the benefits of governance are primarily realised through internal transformations, new management practices, enhanced cooperation, and greater team autonomy, which are the true drivers of performance improvement. This finding, rarely documented in similar contexts, represents one of the

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original contributions of this study, which proposes an integrated theoretical framework linking strategic and organisational governance to the perceived performance of the education system, with organisational innovation identified as the key mediating variable. From a practical perspective, the results suggest that governance should be conceived not as an end in itself, but as a prerequisite for the emergence of internal dynamics conducive to positive transformation. They also call for the adoption of innovative managerial strategies, the promotion of collaboration, and investment in continuous training, particularly in digital governance and change management, while aligning reforms with a systemic innovation logic through decentralisation, local experimentation, and the integration of innovative solutions. Although the conclusions are robust, they are limited by the specific context of the study, which justifies incorporating more internal and external contextual variables in future research, broadening the analysis to include other types of institutions (private, vocational), and exploring other potential mediators such as knowledge management or organisational climate through qualitative or mixed-method approaches.

Conclusion

This paper examines the impact of governance and organisational innovation on the performance and quality of the educational system among Moroccan educators. The study's results, obtained through Structural Equation Modelling (SEM), conclusively show that governance is the key factor driving improvements in educational systems, which, in turn, positively influence the perceived quality of education. Moreover, organisational innovation does not have a direct effect but still plays a significant role in educational system performance, after reinforcing governance practices.

The study concludes that implementing structural reforms in educational systems is necessary, with governance mechanisms and the fostering of a climate that stimulates innovation being the most frequently cited reforms. Therefore, policymakers and education leaders should begin with these two dimensions to have the greatest impact on education quality. However, some limitations, such as the geographically restricted context and the small sample size, should be considered when interpreting the results. Future experiments should examine the implementation of these reforms in other geographic or educational contexts to validate the prototype's strength. Additionally, including other parameters, such as technological resources or organisational culture, would help to better understand the links between governance, innovation, and educational performance.

Declarations

AI Use Statement: The authors confirm that no Artificial Intelligence tools were used in the writing or production of this manuscript.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author,Zouhir ADILE, upon reasonable request.

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Conflict of Interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical Approval: Ethical approval was not required for this study as it did not involve human or animal subjects.

Authors' Contributions: Zouhir ADILE conceived and designed the study; Fatima Zohra SOSSI ALAOUI performed the data collection; Badr GUENNOUN analysed the data; wrote the paper. All authors have read and agreed to the published version.

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