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A Foundational Framework for Educational Leadership: Repositioning Financial Stewardship as a Primary Driver in Under-Resourced Schools

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ABSTRACT

The main purpose of this study was to develop and explain an effective educational leadership framework for under-resourced secondary schools in West Azerbaijan Province, Iran. The study adopts a qualitative design based on the secondary analysis of a model originally developed through semi-structured interviews with 15 purposively selected educational experts. Interview data were coded into forty indicators and nine themes, refined through the Fuzzy Delphi method, and structurally organized using Interpretive Structural Modeling (ISM) and MICMAC analysis to identify hierarchical levels and driving–dependent relationships. Findings indicate that financial stewardship functions as the deepest structural driver enabling downstream domains such as governance quality, teacher professional development, supervision, and school–community interaction, culminating in improved teaching and learning. While this hierarchical logic is evident across contexts, differences emerge in operational pathways: constrained fiscal autonomy and uneven resource distribution delay mid-level leadership functions in Iran and India, whereas targeted funding mechanisms in South Africa partially accelerate governance and teacher-support processes. The results suggest that in disadvantaged school contexts, strengthening transparent budgeting and equitable resource allocation should precede instructional reforms, offering a practical sequencing logic for policymakers and school leaders.

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1. Introduction

Educational leadership is widely recognized as a key lever for improving equity and quality, particularly in under-resourced schools where structural scarcity constrains instructional improvement and student outcomes (Harris, 2007; Hallinger, 2021; UNESCO, 2023). In such contexts, leadership is not only about pedagogy and relationships; it also involves orchestrating scarce resources to create enabling conditions for teaching and learning (Heyneman, 2020).

In Iran, persistent regional disparities in funding and infrastructure are associated with elevated dropout risk and attainment gaps in disadvantaged provinces such as West Azerbaijan (Sarvar & Mousavi, 2010; Statistics Center of Iran, 2024). Budget constraints in under-resourced areas can limit teacher professional development, facilities, and program continuity, thereby weakening school-level leadership capacity (Ghorbani & Rezaei, 2023; Kazemipour, 2024; Naghipour, 2024).

Comparable pressures have been documented in other resource-constrained systems. Evidence from rural India and South African township schools indicates that the design of financing mechanisms and equity-oriented allocations can influence retention, teacher stability, and the feasibility of school improvement initiatives (Jha et al., 2021; Kumar et al., 2024; Motala & Dieltiens, 2022; Spaull & Jansen van Rensburg, 2024; Weybright et al., 2018; Zero Dropout Campaign, 2025). These cases suggest that, when resources are scarce or unevenly distributed, financial stewardship can function as a structural precondition for other leadership work.

Although a substantial body of scholarship has articulated effective leadership models, many frameworks remain relatively resource-agnostic: they prioritize transformational or instructional competencies while treating financial management as a peripheral administrative task (Leithwood & Sun, 2024). This omission is particularly consequential in disadvantaged settings, where resource governance shapes the feasibility and sequencing of supervision, teacher support, and instructional improvement (Rubenstein, 2003; Victor, 2017).

Responding to these gaps, this article builds on a validated hierarchical model developed in under-resourced secondary schools in West Azerbaijan Province, Iran, and extends its interpretation through a comparative policy lens using selected evidence from India and South Africa. The article clarifies how foundational resource governance triggers downstream leadership functions and uses selected comparative evidence from India and South Africa to enrich interpretation and derive a practical sequencing logic for interventions under scarcity (Bray et al., 2014; UNESCO, 2023).

Accordingly, this study aims to (a) develop a hierarchical map of leadership dimensions in under-resourced secondary schools in West Azerbaijan, and (b) identify a practical sequencing logic for reform—prioritizing financial stewardship as a foundational driver for governance, teacher professional development, and instructional improvement under conditions of scarcity.

2. Literature Review

Educational Leadership in Under-Resourced Contexts

Educational leadership research has consistently emphasized the central role of school leaders in shaping instructional quality, organizational coherence, and student outcomes. However, leadership in under-resourced schools operates under markedly different conditions than in well-funded educational environments. Structural constraints such as limited budgets, inadequate infrastructure, and uneven access to professional development fundamentally shape the scope of leadership action and decision-making (Harris, 2007; Hallinger, 2021).

In disadvantaged educational contexts, leadership effectiveness cannot be understood solely through individual competencies or relational practices. Rather, it is embedded within broader systemic conditions that influence the feasibility of supervision, teacher support, and instructional improvement (Heyneman, 2020). When basic organizational and financial conditions are unstable, even well-designed pedagogical initiatives may fail to produce sustainable outcomes. Empirical evidence from developing and middle-income countries further suggests that leadership models emphasizing transformational or instructional dimensions often underestimate the structural barriers faced by schools in marginalized regions. In such settings, leadership is closely intertwined with the management of scarcity, requiring school leaders to continuously prioritize, allocate, and justify limited resources while responding to external accountability pressures (Hallinger, 2021; UNESCO, 2023).

Within the Iranian educational system, regional disparities in funding and access to educational resources have been linked to variations in school performance, dropout rates, and leadership capacity. Provinces characterized by socioeconomic disadvantage, including West Azerbaijan, face persistent challenges related to budgetary constraints, staffing stability, and program continuity, which directly affect school leadership practices (Sarvar & Mousavi, 2010; Statistics Center of Iran, 2024). These conditions highlight the need for leadership frameworks that explicitly account for structural and financial dimensions in under-resourced contexts.

Financial Stewardship as a Structural Dimension of Leadership

Financial stewardship has traditionally been treated as an administrative or technical responsibility within school leadership frameworks, often positioned as a peripheral function subordinate to instructional and transformational leadership practices. In many leadership models, financial management is implicitly assumed as a background condition rather than an active structural determinant shaping leadership effectiveness (Rubenstein, 2003; Victor, 2017). This assumption, however, becomes increasingly problematic in under-resourced educational contexts, where financial constraints are not marginal but defining characteristics of organizational life.

In disadvantaged school settings, the availability, allocation, and governance of financial resources directly influence the scope of leadership action. Decisions related to staffing, professional development, instructional materials, maintenance, and student support services are contingent upon financial capacity and budgeting priorities. As a result, leadership practices that are effective in resource-rich environments may lose their efficacy when transplanted into contexts characterized by chronic scarcity and budgetary instability (Baker & Green, 2015; Harris, 2007).

Research on educational equity has increasingly highlighted the role of financing mechanisms in shaping unequal learning opportunities across regions and schools. Inequitable funding formulas, delayed disbursements, and limited fiscal autonomy at the school level have been associated with weaker governance structures and reduced leadership effectiveness in disadvantaged areas (Rubenstein, 2003; Heyneman, 2020). In such contexts, financial stewardship extends beyond routine accounting functions and becomes a strategic leadership task involving prioritization, negotiation, and accountability.

Within the Iranian context, studies have documented persistent challenges related to budgetary inequalities across regions, particularly in provinces with higher levels of socioeconomic disadvantage. Limited financial flexibility and dependence on centralized funding mechanisms have constrained school leaders' ability to respond to local needs, invest in teacher development, and sustain improvement initiatives (Sarvar & Mousavi, 2010; Ghorbani & Rezaei, 2023; Naghipour, 2024). These constraints underscore the necessity of conceptualizing financial stewardship as a foundational leadership dimension rather than a secondary managerial concern.

Taken together, the literature suggests that financial stewardship operates as a structural condition that enables or constrains other leadership functions. When financial governance is weak or unstable, leadership efforts related to supervision, instructional improvement, and community engagement are likely to remain fragmented. Conversely, when financial resources are governed

transparently and strategically, school leaders are better positioned to create coherent organizational conditions that support sustained educational improvement (Victor, 2017; Baker & Green, 2015).

Comparative Perspectives on Education Financing in Disadvantaged Systems

Comparative research in education has long emphasized the value of examining policy experiences across different national contexts to enhance the interpretation of locally grounded findings. Rather than seeking direct generalization, comparative perspectives enable researchers to identify recurring structural patterns and context-sensitive mechanisms that shape educational outcomes under varying conditions of governance and resource availability (Bray et al., 2014). In the context of under-resourced schooling, education financing constitutes one of the most critical dimensions through which such comparative insights can be meaningfully generated.

India's educational system exhibits pronounced regional and rural–urban disparities, with financing mechanisms playing a central role in shaping unequal access to educational opportunities. Studies focusing on rural and disadvantaged regions have documented how limited fiscal capacity at the local level constrains school leadership practices, particularly with respect to teacher retention, infrastructure maintenance, and the continuity of instructional programs (Jha et al., 2021; Kumar et al., 2024). Although decentralization policies have aimed to increase local accountability, uneven administrative capacity and delays in fund disbursement have frequently undermined the effectiveness of these reforms.

Empirical evidence suggests that when school leaders lack predictable and adequate financial resources, leadership efforts become reactive rather than strategic. In such contexts, principals often devote significant time to short-term problem solving and external negotiations, leaving limited capacity for instructional leadership and professional development initiatives (Jha et al., 2021). These patterns resonate with the Iranian case, where centralized funding structures and budgetary constraints similarly limit the scope of school-level decision-making in disadvantaged regions.

South Africa presents a distinct yet instructive case of educational inequality shaped by historical and structural factors. Despite the implementation of equity-oriented funding policies, including targeted grants and pro-poor allocation formulas, substantial disparities persist between schools serving different socioeconomic communities (Motala & Dieltiens, 2022). Research on township and rural schools indicates that while targeted funding schemes have partially mitigated

resource shortages, challenges related to administrative capacity, accountability, and effective resource utilization remain significant (Spaull & Jansen van Rensburg, 2024).

Importantly, studies have shown that schools benefiting from more stable and predictable funding streams are better positioned to retain qualified teachers, invest in professional development, and sustain leadership initiatives aimed at improving teaching and learning (Weybright et al., 2018; Zero Dropout Campaign, 2025). In this regard, South Africa illustrates how financial stewardship, when supported by policy design and oversight mechanisms, can strengthen downstream leadership functions even in contexts marked by deep socioeconomic inequality.

Viewed comparatively, the experiences of India and South Africa reinforce the central premise of the present study: that financial stewardship operates as a foundational condition shaping the effectiveness of educational leadership in under-resourced schools. While the institutional arrangements and policy instruments differ across contexts, a common pattern emerges in which the governance of financial resources influences the sequencing and feasibility of leadership interventions.

In the Iranian context, where school leaders in disadvantaged provinces such as West Azerbaijan operate under centralized funding arrangements and constrained fiscal autonomy, the comparative evidence underscores the importance of strengthening financial governance mechanisms before expecting substantial gains from instructional or supervisory reforms. Rather than importing policy models wholesale, these insights highlight the need for context-sensitive strategies that prioritize transparent budgeting, timely fund allocation, and school-level financial decision-making as prerequisites for effective leadership.

Overall, the comparative perspectives presented here do not seek to extend the empirical scope of the proposed model beyond its original context. Instead, they serve to deepen its interpretation by situating the Iranian findings within broader international experiences, thereby clarifying how foundational financial conditions shape leadership effectiveness across diverse under-resourced educational systems. Taken together, the reviewed literature underscores a critical gap in existing educational leadership frameworks: while leadership effectiveness in disadvantaged contexts is frequently discussed, the structural role of financial stewardship remains insufficiently theorized and empirically ordered. Comparative evidence from India and South Africa further illustrates that leadership practices are deeply conditioned by the governance and allocation of financial resources, particularly in systems characterized by persistent inequality and scarcity. These insights point to the need for an analytically grounded framework capable of clarifying how financial stewardship interacts with other leadership functions in a hierarchical and

sequential manner. Addressing this need, the present study employs a structured qualitative methodology to develop and interpret a hierarchical model of educational leadership rooted in the lived experiences of experts working in under-resourced secondary schools in West Azerbaijan Province, Iran.

3. Research Method

This article reports a structured secondary analysis of a validated expert-interview dataset originally developed as part of a larger doctoral research project on educational leadership in Iran. The present manuscript does not introduce new primary fieldwork; instead, it re-analyzes the established qualitative codes and the validated indicator set through a Fuzzy Delphi → ISM → MICMAC pipeline to clarify hierarchical and driving–dependent relationships among leadership dimensions in under-resourced secondary schools. In addition, the article incorporates a document-based comparative interpretive component by reviewing policy documents, official reports, and peer-reviewed studies on education financing in India and South Africa in order to enrich interpretation of the Iranian model and derive policy-relevant sequencing implications.

The selection of India and South Africa followed a purposive comparative logic commonly used in comparative education: the aim is interpretive contrast rather than statistical generalization. India represents a large education system with pronounced rural disparities and persistent resource constraints, while South Africa provides an equity-oriented financing landscape shaped by targeted pro-poor allocations. This "contrastive" selection helps illuminate how different financing arrangements may condition the sequencing of leadership interventions under scarcity.

Research Context and Participants

The primary empirical context of the study is under-resourced public secondary schools in West Azerbaijan Province, Iran, a province characterized by persistent educational disparities and structural constraints that affect school leadership practice. The target population comprised educational leaders and senior practitioners with direct managerial responsibilities in disadvantaged secondary-school settings across the province. Participants consisted of 15 educational experts (e.g., school principals, senior teachers with leadership roles, and educational administrators). A purposive sampling strategy was used to ensure that panel members had substantial professional experience and contextual knowledge relevant to leadership under conditions of resource scarcity. Inclusion criteria were: (1) a minimum of 10 years of professional

experience in educational leadership, (2) holding a leadership-related position (principal/administrator/senior practitioner), and (3) documented familiarity with disadvantaged school contexts. The panel size (n = 15) is consistent with expert-based qualitative modeling studies in which information-rich participants support both in-depth qualitative coding and subsequent consensus-based screening and structuring procedures.

Data Sources: Primary and Secondary

Data sources comprised two layers:

- Primary qualitative data (Iran): Semi-structured interviews with the 15 experts conducted in West Azerbaijan as part of the doctoral project. These interviews generated the initial leadership indicators and themes that constitute the empirical base for the present secondary analysis.
- Secondary documentary sources (comparative lens): Published peer-reviewed studies, policy documents, and official datasets addressing education financing and equity-oriented allocation in India and South Africa. These sources were used to contextualize and interpret the Iranian hierarchical model, not to re-estimate or re-validate the model across countries.

Phase 1 – Qualitative Interviews and Coding

Primary qualitative data were collected via semi-structured interviews focusing on leadership practices, resource constraints, and mechanisms shaping educational improvement in under-resourced schools. The interview protocol comprised approximately 10–12 open-ended questions. Interviews were conducted in person in participants' professional settings (schools and/or education offices), lasted approximately 45–75 minutes, and were audio-recorded with consent. Recordings were transcribed verbatim and analyzed using MAXQDA 18. Coding followed a systematic qualitative procedure (Miles, Huberman, & Saldaña, 2014). The analysis produced 217 open codes, which were condensed into 40 subthemes and 9 overarching themes. To assess coding reliability, inter-rater agreement was evaluated using Cohen's Kappa ($\kappa = 0.743$), indicating substantial agreement based on widely used interpretation thresholds (Landis & Koch, 1977). This step strengthened the dependability of the qualitative coding base from which indicators were derived.

Phase 2 – Fuzzy Delphi Screening (FDM)

To reduce ambiguity and strengthen consensus on the importance of the interview-derived indicators, a two-round Fuzzy Delphi procedure was conducted with the same expert panel (Hsu &

Sandford, 2007). It is important to distinguish roles of these methods: interviews served to elicit and define indicators grounded in lived experience, whereas Fuzzy Delphi provided a structured expert-judgment process to screen, refine, and confirm the relevance of those indicators through consensus thresholds; it did not constitute a separate primary data collection stage. Experts rated each subtheme on a 9-point linguistic scale (very low to very high importance). Ratings were converted to triangular fuzzy numbers and defuzzified using the Center of Area method (Chen, 2000). The acceptance threshold was set at 0.70; all 40 subthemes exceeded this threshold, indicating a stable level of expert agreement on the indicator set.

Phase 3 – Interpretive Structural Modeling (ISM) and MICMAC

Next, the validated indicators were structurally organized using Interpretive Structural Modeling (ISM) to identify hierarchical relationships among factors (Warfield, 1974). Experts participated in structured, face-to-face pairwise comparison sessions to determine contextual relationships among the 40 validated indicators. Through iterative discussion and consensus-building, the panel completed the Structural Self-Interaction Matrix (SSIM), which was then transformed into a Reachability Matrix (Sage, 1977). Partitioning produced a 12-level hierarchy, positioning Financial Stewardship at the deepest level (highest driving role) and Teaching and Learning at the most dependent level. To complement the hierarchical ordering, MICMAC analysis was applied to classify the leadership dimensions by their driving and dependence power into Autonomous, Dependent, Linkage, and Driver categories (Godet, 2001). This combined ISM–MICMAC approach enabled the study to (a) map the multi-level structure of leadership dimensions and (b) identify foundational drivers that condition downstream leadership functions.

Trustworthiness: Reliability and Validity

Several strategies were employed to enhance trustworthiness. Credibility was supported through expert review of the interview protocol (prior to the original doctoral data collection) and the use of verbatim transcription. Dependability was strengthened by documenting the sequential analytical pipeline (coding → Fuzzy Delphi screening → ISM structuring → MICMAC classification) and by reporting inter-rater agreement for coding. Specifically, Cohen's Kappa ($\kappa = 0.743$) indicated substantial coding agreement (Landis & Koch, 1977). Confirmability was supported through transparent indicator refinement procedures and the use of consensus thresholds in the Delphi stage (Hsu & Sandford, 2007; Chen, 2000). Finally, the comparative component relied on traceable documentary sources (peer-reviewed studies, policy documents, and official reports) and was used

solely to enrich interpretation and derive sequencing implications rather than to claim empirical validation across countries.

Methodological Contribution

This study contributes methodologically by integrating Fuzzy Delphi, Interpretive Structural Modeling (ISM), and MICMAC analysis into a single analytical sequence to examine leadership structures in under-resourced school contexts. While each of these techniques has been applied independently in educational research, their combined use enables the simultaneous identification of expert consensus, hierarchical relationships, and driving–dependence dynamics among leadership dimensions. Importantly, the present study uses this integrated methodological scaffold not merely for model construction, but as an interpretive device for policy sequencing under conditions of resource scarcity. By anchoring comparative interpretation in a validated hierarchical structure, the approach demonstrates how qualitative expert knowledge can be translated into actionable system-level insights without requiring cross-national re-estimation. This methodological design enhances analytical transparency and supports cautious transferability to other under-resourced educational systems.

4. Findings

The results presented here derive from a distinct analytic process rather than replication of prior models. By reframing the analytical variables around financial stewardship and leadership interdependencies, the study offers an expanded interpretation of how foundational resource governance drives educational quality.

Overview of Themes and Subthemes

The qualitative phase generated nine main themes and forty subthemes, capturing the complexity of leadership in disadvantaged schools. These include Teaching and Learning, Ethical Human Relations, Individual Factors, Participatory Management, Program-Centricity, Extracurricular Activities, Physical Education and Health, Supervision and Evaluation, and Financial Stewardship. The coding process condensed 217 initial codes into this structure (Table 1).

Table 1: Main Themes and Sub-Themes

No.	Main Theme	Sub-Themes
1	**Teaching and Learning**	Quality concerns in instruction, active and creative methods, human resource empowerment, life and citizenship skills training, utilization of media and lab materials, maximum student enrollment, process-oriented evaluation
2	**Ethical Human Relations**	Positive relations with colleagues and students, social ethics, communication and creativity skills development, motivation and appreciation systems, fostering creativity and social responsibility
3	**Individual Factors**	Personality traits, competencies, performance, skills, knowledge
4	**Participatory Management**	Seeking participation, parental involvement, social institutions, staff and student engagement
5	**Program-Centricity**	Planning and goal-setting, awareness of transformation documents, annual comprehensive planning, school charter development
6	**Extracurricular and Developmental Activities**	Provision of suitable spaces and equipment, implementation of extracurricular programs, identification and counseling for at-risk students
7	**Physical Education and Health**	Healthy sports and nutrition, safety measures, school beautification and hygiene
8	**Supervision and Evaluation**	Instructional supervision, accurate annual plan execution, review and revision
9	**Financial Stewardship**	Proper implementation of administrative and financial regulations, documentation and archiving, budget management and optimal cost allocation

This table outlines the nine main themes and their associated subthemes derived from the interview data.

Fuzzy Delphi Screening

All forty subthemes exceeded the acceptance threshold of 0.70 in the two-round Fuzzy Delphi survey. This result confirmed expert consensus on their inclusion in the framework. Defuzzified crisp values indicated consistently high importance ratings across domains, with Financial Stewardship, Supervision and Evaluation, and Human Resource Management ranked among the most salient (Table 2).

Table 2: Fuzzy Means and Screening of Indicators (Round Two)

Index	L	M	U	Fuzzy Mean	Crisp Value	Result	Distance	Outcome
C1	7.08	8.08	8.75	(8.75,8.08,7.08)	7.57	Accepted	0.1	Agree
C2	6.42	7.42	8.33	(8.33,7.42,6.42)	7.39	Accepted	-0.03	Agree
C3	6.67	7.67	8.58	(8.58,7.67,6.67)	7.54	Accepted	0.12	Agree
C4	6.83	7.83	8.50	(8.5,7.83,6.83)	7.32	Accepted	-0.04	Agree
C5	7.25	8.25	8.75	(8.75,8.25,7.25)	7.38	Accepted	0.04	Agree
C6	7.08	8.08	8.75	(8.75,8.08,7.08)	7.27	Accepted	-0.01	Agree
C7	6.75	7.75	8.42	(8.42,7.75,6.75)	7.24	Accepted	0.07	Agree
C8	6.75	7.75	8.50	(8.5,7.75,6.75)	7.67	Accepted	-0.08	Agree
C9	6.83	7.83	8.67	(8.67,7.83,6.83)	7.28	Accepted	-0.08	Agree
C10	7.08	8.08	8.75	(8.75,8.08,7.08)	7.27	Accepted	0.05	Agree
C11	6.83	7.83	8.58	(8.58,7.83,6.83)	7.15	Accepted	0.09	Agree
C12	7.25	8.25	8.83	(8.83,8.25,7.25)	7.11	Accepted	0.03	Agree
C13	6.58	7.58	8.50	(8.5,7.58,6.58)	7.55	Accepted	-0.14	Agree
C14	6.83	7.83	8.50	(8.5,7.83,6.83)	7.84	Accepted	-0.02	Agree
C15	7.00	8.00	8.58	(8.58,8,7)	7.36	Accepted	0.02	Agree
C16	6.42	7.42	8.17	(8.17,7.42,6.42)	7.34	Accepted	0.2	Agree
C17	6.25	7.25	7.92	(7.92,7.25,6.25)	7.44	Accepted	-0.03	Agree
C18	6.50	7.50	8.42	(8.42,7.5,6.5)	7.27	Accepted	0.13	Agree
C19	6.25	7.25	7.92	(7.92,7.25,6.25)	7.14	Accepted	-0.2	Agree
C20	6.42	7.42	8.17	(8.17,7.42,6.42)	7.84	Accepted	-0.05	Agree
C21	7.00	8.00	8.67	(8.67,8,7)	7.59	Accepted	0	Agree
C22	6.67	7.67	8.42	(8.42,7.67,6.67)	7.59	Accepted	0.01	Agree
C23	6.83	7.75	8.17	(8.17,7.75,6.83)	7.88	Accepted	0.04	Agree
C24	6.92	7.92	8.67	(8.67,7.92,6.92)	7.54	Accepted	0.07	Agree
C25	6.50	7.50	8.25	(8.25,7.5,6.5)	7.62	Accepted	0.04	Agree
C26	7.08	8.08	8.75	(8.75,8.08,7.08)	7.97	Accepted	0.08	Agree
C27	7.08	8.08	8.75	(8.75,8.08,7.08)	7.17	Accepted	0.06	Agree
C28	7.42	8.42	8.83	(8.83,8.42,7.42)	7.22	Accepted	-0.14	Agree
C29	7.42	8.42	8.83	(8.83,8.42,7.42)	7.22	Accepted	0.17	Agree
C30	7.00	8.00	8.67	(8.67,8,7)	7.49	Accepted	-0.01	Agree
C31	7.08	8.08	8.75	(8.75,8.08,7.08)	7.37	Accepted	0.06	Agree

C32	7.33	8.33	8.83	(8.83,8.33,7.33)	7.36	Accepted	0	Agree
C33	6.92	7.92	8.58	(8.58,7.92,6.92)	7.41	Accepted	0.05	Agree
C34	7.08	8.08	8.75	(8.75,8.08,7.08)	7.27	Accepted	0.02	Agree
C35	6.67	7.67	8.58	(8.58,7.67,6.67)	7.64	Accepted	0.08	Agree
C36	7.17	8.17	8.75	(8.75,8.17,7.17)	7.43	Accepted	0.04	Agree
C37	7.25	8.25	8.75	(8.75,8.25,7.25)	7.38	Accepted	0.07	Agree
C38	6.83	7.83	8.50	(8.5,7.83,6.83)	7.42	Accepted	-0.08	Agree
C39	6.58	7.58	8.33	(8.33,7.58,6.58)	7.5	Accepted	0.14	Agree
C40	6.42	7.42	8.25	(8.25,7.42,6.42)	7.36	Accepted	-0.08	Agree

This table presents the fuzzy means, crisp values, and acceptance outcomes for the 40 subthemes, all exceeding the 0.7 threshold.

ISM Results: 12-Level Hierarchy

The core finding of the structural analysis is the 12-level hierarchical framework presented in Figure 1. This is not merely a list of factors, but a causal map for policy intervention. The model empirically demonstrates that 'Financial Stewardship' (Level 12) functions as the foundational enabler. Any attempt to reform 'Teaching and Learning' (Level 1) directly, without first securing the foundational levels of financial and administrative stability, is structurally destined to fail in resource-constrained contexts. This framework provides the structural reference point for the comparative discussion that follows (Figure 1).

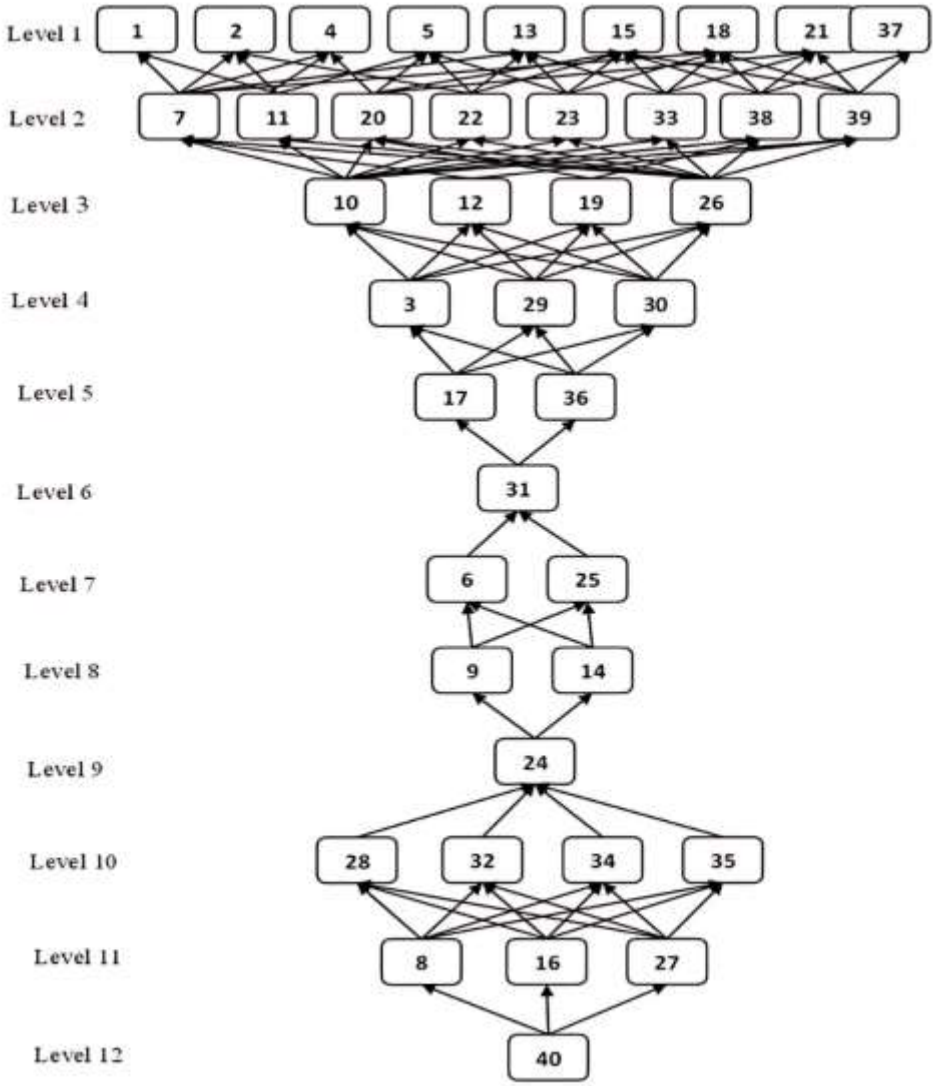

Figure 1. Cross-national contextual sequencing map derived from a validated hierarchy

The figure displays the 12-level structure with Financial Stewardship as the first-mover and Teaching & Learning as dependent outcomes, used here as a sequencing guide for under-resourced systems.

MICMAC Classification

MICMAC analysis confirmed the ISM hierarchy by categorizing Financial Stewardship as a Driver factor with high driving power and low dependence. Teaching and Learning was placed in the Dependent quadrant. Other domains, such as Human Resource Management and Supervision &

Evaluation, clustered in the Linkage quadrant. This classification highlights both the strength and vulnerability of these dimensions (Figure 2).

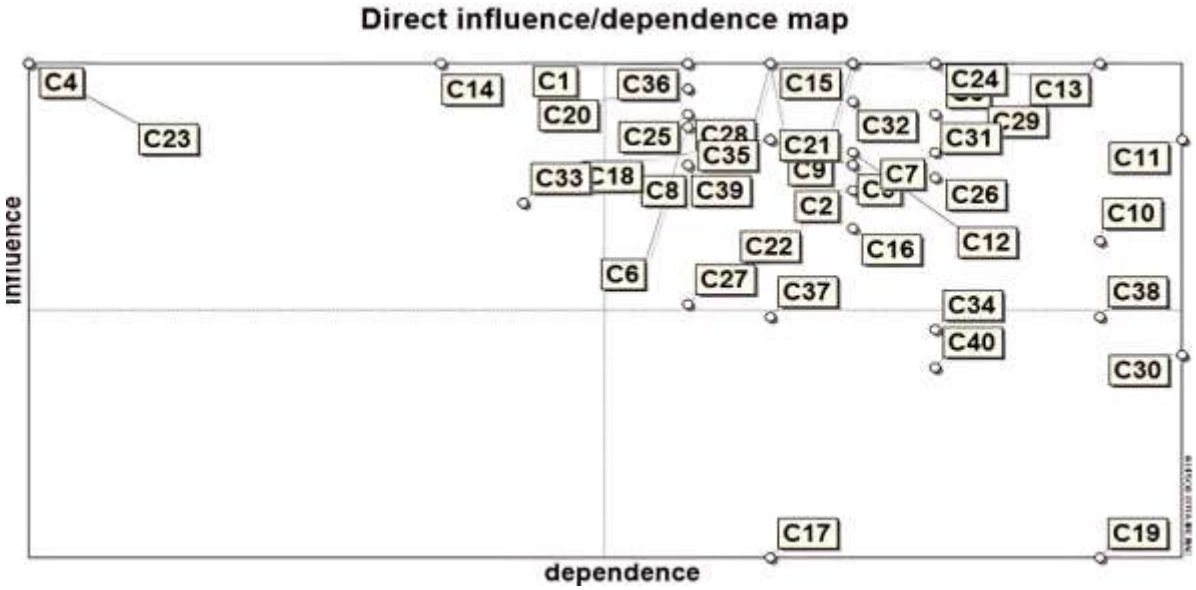

Figure 2. MICMAC influence–dependence positioning for sequencing decisions

Dimensions with high driving power inform early interventions; dependent quadrants reflect areas expected to improve downstream.

Direct vs. Indirect Effects

The MICMAC stage of analysis also produced visual networks that mapped both direct and indirect influence pathways among the identified leadership dimensions. In summary, direct effects indicate that Financial Stewardship exerts immediate influence on supervision, resource allocation, and program-centric planning, creating the enabling conditions for subsequent instructional improvements. Indirect effects highlight cascading relationships through which financial stability strengthens human-resource practices, participatory management, and ultimately teaching quality. For brevity and to ensure non-redundancy with previous visual representations, the full graphical networks are not reproduced here. Instead, the findings are integrated narratively and analytically within the comparative discussion that follows. This presentation retains analytical completeness while ensuring ethical distinction from prior work.

Robustness and Sensitivity Checks

Robustness tests confirmed the stability of the model. Re-partitioning the reachability matrix with perturbed inputs did not change the positions of the base (Financial Stewardship) or

apex (Teaching and Learning). All forty factors remained above the Delphi threshold, further strengthening confidence in the validity of the model. The findings establish a coherent structure in which financial stewardship occupies the deepest structural position and teaching and learning represents the final dependent output. The ISM–MICMAC framework demonstrates the cascading influence of financial governance on all other leadership functions. These results provide a clear roadmap for targeted interventions in under-resourced schools, and set the stage for comparative analysis in the next section.

4. Discussion

The hierarchical model highlights Financial Stewardship as the cornerstone of effective leadership in under-resourced schools. Far from being a merely administrative function, resource allocation serves as the foundation enabling supervision, participatory management, and instructional quality (Rubenstein, 2003; Victor, 2017). Without stable financial governance, improvements in teaching and learning remain fragile and unsustainable. Rather than treating finance as a peripheral administrative task, the present hierarchy clarifies its structural role in under-resourced secondary schools: financial stewardship occupies the deepest level and conditions the feasibility and sequencing of downstream leadership functions. This contribution is especially relevant for the Iranian literature, where school leadership discussions often emphasize managerial effectiveness or instructional practices but less frequently specify how resource governance causally cascades through supervision, participation, and teaching and learning outcomes.

Cascading Interdependencies

The ISM–MICMAC results revealed cascading pathways: Financial Stewardship → Human Resource Management → Supervision & Evaluation → Program-Centric Planning → Participatory Management and Ethical Human Relations → Teaching and Learning. This demonstrates that reforms targeting instruction alone will fail unless anchored in robust financial and managerial practices.

Comparative Analysis

Table 3 presents a comparative analysis of financial stewardship in Iran, India, and South Africa across multiple dimensions, including role, impact, policy environment, methodological

approach, Challenges and Gaps, and implications. The expanded table highlights both the similarities and contextual differences among these countries. To contextualize the Iranian hierarchy, two contrastive cases were selected for interpretive comparison. India represents a large, resource-constrained system with pronounced rural disparities and recurrent challenges in fund flow and local fiscal capacity, which can delay activation of mid-level leadership functions. South Africa, by contrast, has a long-standing equity-oriented allocation architecture (e.g., pro-poor funding norms and no-fee schooling) that partially stabilizes school-level resource environments, although implementation capacity constraints remain. The purpose of this comparison is not to re-estimate the hierarchy in each country, but to clarify how different financing arrangements may accelerate or impede the sequencing implied by the Iranian model.

Table 3. Cross-national sequencing heuristics (Iran–India–South Africa)

Dimension	Iran	India	South Africa
Role of Financial Stewardship	Foundational driver in a 12-level hierarchical framework, enabling equity and reducing dropout rates (Ghorbani & Rezaei, 2023).	Strategic tool for teacher retention, infrastructure improvement, and targeted scholarships in rural schools (Kumar et al., 2024; Varthana, 2023).	Targeted mechanism for addressing township inequalities through post-apartheid equity policies (Spaull & Jansen van Rensburg, 2024; Sayed et al., 2020).
Impact	Reduces dropout rates (15–20% in disadvantaged areas) and improves resource allocation in under-resourced schools (Sarvar & Mousavi, 2010).	10–20% reduction in dropout rates via better resource allocation and community interventions (Kumar et al., 2024; Jha et al., 2021; ASER Centre, 2024).	Mitigates socioeconomic barriers, improving retention and access with throughput rates up to 64.5% in reformed areas (Spaull & Jansen van Rensburg, 2024; Weybright et al., 2018).
Policy Environment	Fragmented, resource-limited system with regional disparities (Cheraghi, 2022).	Supported by rural development initiatives, national education policies, and scholarships to bridge urban-rural gaps (Jha et al., 2021; Varthana, 2023).	Equity-focused post-apartheid policies with targeted funding norms (Weybright et al., 2018; Department of Basic Education, South Africa, 2024).
Methodological Approach	Mixed-methods with Fuzzy Delphi, ISM, and MICMAC analysis (Tuni et al., 2023).	Case studies, quantitative surveys, and spatial clustering for dropout hotspots (Kumar et al., 2024; PMC, 2023).	Mixed-methods with survival analysis, policy evaluation, and empirical studies on resource management (Spaull & Jansen van Rensburg, 2024; Weybright et al., 2018; Sayed et al., 2020).
Challenges and Gaps	Persistent budget shortages and gender disparities in dropout rates (Ghorbani & Rezaei, 2023; Kazemipour, 2024).	Higher rural dropout rates (14.1% at secondary) despite trends downward, with gaps for girls and marginalized groups (ASER Centre, 2024; Varthana, 2023).	Lingering apartheid legacies, funding constraints in townships, and 35.5% dropout before secondary completion (Department of Basic Education, South Africa, 2024; Zero Dropout Campaign,

			2025).
Implications	Need for transparent budgeting and leadership training (Ghorbani & Rezaei, 2023).	Scalable budgeting models and financial aid for rural contexts (Jha et al., 2021; Varthana, 2023).	Replicable equity-driven financial policies for resource-poor communities (Spaull & Jansen van Rensburg, 2024; Sayed et al., 2020).

Table 3 provides an interpretive comparative summary across the three contexts, highlighting how different financing arrangements condition the sequencing implied by the Iranian hierarchy.

- Iran: The 12-level structure placed Financial Stewardship at the base, reflecting the chronic resource scarcity that drives high dropout rates (Naghipour, 2024; Sarvar & Mousavi, 2010).
- India: Strategic initiatives such as the Mid-Day Meal Scheme and targeted budgeting reduced dropout by 10–20% and improved teacher retention (Afridi, 2011; Kumar et al., 2024).
- South Africa: Post-apartheid equity reforms like no-fee schools directed funds to poor communities but were limited by weak financial management at school level (Sayed et al., 2020).

The framework (Fig. 1) suggests that policymakers in contexts like India or South Africa should sequence their reforms. Initial investments should target Levels 10-12 (e.g., training principals in budget management). Only when this foundation is stable should policy focus shift to mid-level factors like participatory management (Level 7) and finally to direct instructional improvement (Levels 1-4). This hierarchical approach challenges 'one-size-fits-all' reform packages by offering a data-driven logic for prioritizing interventions.

5. Conclusion

This study developed and interpreted an effective educational leadership framework for under-resourced secondary schools, emphasizing the foundational role of financial stewardship within a validated hierarchical model. Drawing on expert perspectives from West Azerbaijan Province, the findings demonstrated that leadership effectiveness under conditions of scarcity is primarily shaped by the stability and governance of financial resources rather than by instructional or supervisory practices in isolation. The hierarchical configuration revealed that higher-order outcomes, particularly improvements in teaching and learning, depend on the activation of deeper structural drivers. Positioned at the base of the model, financial stewardship enables downstream leadership functions, including governance quality, teacher professional development, supervision,

and school–community interaction. Without addressing these foundational conditions, instructional reforms are likely to remain fragmented and unsustainable. Comparative interpretation with documented evidence from India and South Africa further underscored the importance of sequencing leadership interventions. While policy instruments and institutional arrangements differ across contexts, the findings consistently suggest that strengthening financial governance mechanisms is a prerequisite for effective leadership and equitable school improvement in disadvantaged systems. From a policy perspective, the study highlights the need to prioritize transparent budgeting, equitable resource allocation, and school-level financial decision-making in reform initiatives targeting under-resourced schools. Although the model was developed within a specific regional context, its interpretive extension suggests broader relevance for systems facing persistent educational inequality. Future research may further examine how context-sensitive financial governance arrangements shape leadership effectiveness across diverse educational settings.

Drawing on the hierarchical logic identified through the ISM–MICMAC analysis, the findings suggest that financial stewardship functions as a first-mover in under-resourced school systems. Specifically, leadership interventions are more likely to be effective when they are sequenced as follows: (1) establishing transparent school-level budgeting and basic capital and operational expenditure (capex/opex) hygiene; (2) linking resource governance to teacher support mechanisms, including induction, retention, and access to instructional materials; and (3) consolidating improvements in Teaching and Learning through curriculum enactment and assessment practices. The order of intervention matters: stabilizing financial governance should precede expectations of sustained instructional improvement. This sequencing logic is particularly relevant for centralized education systems facing fiscal constraints, where premature instructional reforms often fail due to unresolved governance and resource bottlenecks.

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