

# An Algorithmic Leadership Framework For School Leaders: Leveraging Data For School Improvement

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**Abstract:** *The increasing demand for evidence-based educational leadership has intensified the need for school leaders to effectively utilize data in decision-making and school improvement initiatives. Despite the availability of assessment results, school information systems, and accountability mechanisms, many school leaders continue to encounter challenges in translating data into meaningful actions that improve educational outcomes. This study aimed to develop an algorithmic leadership framework that supports school heads in leveraging data for school improvement. Guided by Van Manen's hermeneutic phenomenology, the study explored the lived experiences of fifteen school heads from the Division of Malaybalay City, Philippines. Data were collected through semi-structured interviews, focus group discussions, and field observations and were analyzed through thematic analysis. Findings revealed seven major themes: data as compass for leadership; navigating the emotional landscape of data; data as a strategic compass for school improvement; building a culture of data-driven collaboration; challenges in practicing data-driven leadership; aspirations for algorithmic leadership; and unintended consequences and ethical reflections in data use. Results indicate that data serves as an essential guide for planning, decision-making, monitoring, collaboration, and school improvement. However, barriers such as limited data literacy, technological constraints, reporting overload, and varying stakeholder readiness continue to affect effective utilization of data. Drawing from these findings, the study developed the THRIVE Framework for Algorithmic Leadership in School Improvement. The framework provides a context-responsive model that guides school leaders in interpreting data, integrating evidence into leadership decisions, implementing targeted interventions, monitoring outcomes, and sustaining continuous improvement. The study contributes to the growing body of knowledge on educational leadership by presenting a practical and evidence-based framework that strengthens school leaders' capacity to use data strategically while maintaining ethical, collaborative, and learner-centered leadership practices.*

**Keywords**—algorithmic leadership, data-driven decision-making, educational leadership, school improvement, school heads, thrive framework

## 1. INTRODUCTION

Educational leadership has undergone significant transformation over the past decades. School heads are no longer viewed solely as managers of school operations but are increasingly expected to become instructional leaders, strategic decision-makers, and catalysts of continuous improvement. This evolving role has been accompanied by a growing emphasis on data-driven decision-making, where educational leaders utilize assessment results, performance indicators, and information systems to inform policies, programs, and interventions.

Globally, educational systems have increasingly recognized the importance of data in improving teaching, learning, and organizational performance. Data-driven decision-making has emerged as a critical leadership practice that enables school leaders to identify learning gaps, allocate resources efficiently, monitor progress, and design evidence-based interventions. Educational reforms in many countries have emphasized accountability, transparency, and evidence-based planning, reinforcing the role of data as a central component of school improvement.

In the Philippine context, the Department of Education has institutionalized several mechanisms that encourage data-informed leadership. The Philippine Professional Standards for School Heads (PPSSH) emphasize the use of evidence in strategic leadership, instructional supervision, resource management, professional development, and stakeholder engagement. Likewise, systems such as the Learner Information System (LIS), Enhanced Basic Education Information System (EBEIS), School-Based Management (SBM) assessment, National Achievement Test (NAT), Philippine Informal Reading Inventory (Phil-IRI), and other assessment tools provide school leaders with a wealth of information to guide decision-making.

Despite the availability of these systems and resources, challenges persist. Many school heads continue to struggle with data interpretation, analysis, and application. Issues related to technological limitations, inadequate training, reporting overload, and limited stakeholder participation often hinder meaningful data utilization. Consequently, leadership decisions may continue to rely on intuition, tradition, or compliance-oriented practices rather than evidence-based approaches.

The concept of algorithmic leadership offers a promising lens through which school leaders may strengthen data utilization

practices. Algorithmic leadership refers to a leadership approach in which decisions are informed through systematic interpretation of data, structured analysis, digital platforms, and evidence-based processes while preserving human judgment, ethical considerations, and contextual understanding. Rather than replacing professional expertise, algorithmic leadership seeks to enhance decision-making through informed and strategic use of available information.

This study aimed to develop an algorithmic leadership framework that supports school heads in leveraging data for school improvement. Specifically, it explored the lived experiences of school heads in using data across leadership domains and identified key elements that may inform the development of a practical framework for data-informed leadership.

## 2. METHODOLOGY

This study employed a qualitative research design utilizing Van Manen's hermeneutic phenomenological approach. Hermeneutic phenomenology seeks to understand and interpret the lived experiences of individuals within their real-world contexts. This approach was deemed appropriate because the study focused on understanding how school heads experience and utilize data in their leadership practices.

The study was conducted in the Division of Malaybalay City, Bukidnon, Philippines. Fifteen school heads from elementary, secondary, and integrated schools participated in the research. Participants were selected using purposive sampling based on their leadership experience and active involvement in school-level data utilization.

Data were collected through semi-structured interviews, focus group discussions, and field observations. Interviews explored participants' experiences, perceptions, challenges, and aspirations regarding data utilization. Focus group discussions enabled deeper exploration of shared experiences and emerging insights.

Data analysis followed thematic analysis procedures. Significant statements were identified, coded, clustered into categories, and synthesized into overarching themes. Trustworthiness was ensured through triangulation, member checking, prolonged engagement, and reflexive analysis.

## 3. RESULTS AND DISCUSSION

### Theme 1: Data as Compass for Leadership

Participants consistently described data as the primary guide for leadership decisions. Assessment results, school reports, enrollment records, and performance indicators served as essential reference points in planning interventions, monitoring progress, and evaluating outcomes. School heads emphasized that data enabled them to move beyond intuition and base decisions on evidence.

The findings suggest that data functions as a leadership compass, providing direction for school improvement initiatives. Consistent with literature on data-driven decision-making, school leaders viewed data as a foundation for accountability, strategic planning, and instructional improvement.

### Theme 2: Navigating the Emotional Landscape of Data

Participants revealed that data use is not solely a technical activity but also an emotional experience. School leaders often felt pressure when confronted with unfavorable results, accountability demands, and stakeholder expectations. At the same time, positive data outcomes generated feelings of confidence, accomplishment, and motivation.

These findings indicate that effective data utilization requires emotional resilience and reflective leadership. School leaders must navigate both the technical and emotional dimensions of evidence-based decision-making.

### Theme 3: Data as a Strategic Compass for School Improvement

Data played a critical role in identifying priorities, setting goals, allocating resources, and monitoring implementation. School heads described using assessment results, enrollment trends, and performance indicators to formulate strategic interventions aligned with school needs.

The findings reinforce the importance of strategic leadership grounded in evidence. Data enabled leaders to identify opportunities for improvement and evaluate the effectiveness of interventions over time.

### Theme 4: Building a Culture of Data-Driven Collaboration

Participants emphasized that successful data utilization depends on collaboration among teachers, coordinators, parents, and community stakeholders. Data discussions during meetings, learning action cells, and school improvement planning processes encouraged shared ownership of improvement initiatives.

The findings suggest that data-informed leadership flourishes within collaborative cultures where evidence is collectively interpreted and acted upon.

### Theme 5: Challenges in Practicing Data-Driven Leadership

Several challenges emerged, including limited data literacy, inadequate technological infrastructure, reporting overload, competing responsibilities, and stakeholder readiness. These barriers often constrained school leaders' ability to maximize the value of available data.

The findings highlight the need for sustained professional development, technical support, and organizational systems that facilitate effective data utilization.

### Theme 6: Aspirations for Algorithmic Leadership

Participants expressed aspirations for more systematic, technology-enabled, and evidence-based leadership practices. School heads envisioned leadership processes that integrate

digital tools, data analytics, and structured decision-making while maintaining professional judgment and contextual sensitivity.

Theme 7: Ethical Reflections in Data Use

Participants recognized the ethical implications of data utilization, including concerns regarding privacy, confidentiality, fairness, and responsible interpretation of information. Ethical leadership emerged as a critical component of effective data use.

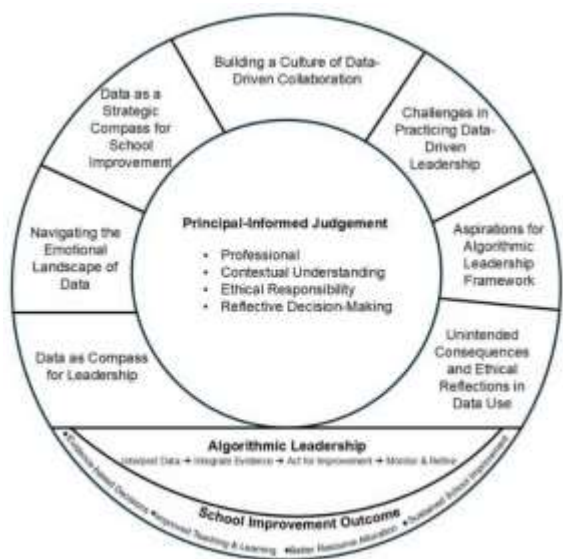
**4. THE THRIVE FRAMEWORK FOR ALGORITHMIC LEADERSHIP**

Based on the findings, the study proposes the THRIVE Framework for Algorithmic Leadership in School Improvement. The framework conceptualizes how school leaders leverage data to promote continuous improvement through interconnected leadership processes.

The framework emphasizes:

- T – Transforming Data into Meaningful Insights
- H – Harnessing Evidence for Strategic Decisions
- R – Responding Through Targeted Interventions
- I – Integrating Collaboration and Stakeholder Engagement
- V – Validating Progress Through Monitoring and Evaluation
- E – Ensuring Ethical and Sustainable Leadership Practices

The THRIVE Framework highlights the integration of evidence-based decision-making, collaboration, ethical leadership, and continuous improvement. It serves as a practical guide for school heads seeking to strengthen their capacity for data-informed leadership.



**5. CONCLUSION**

The study demonstrates that data has become an indispensable component of contemporary educational leadership. School heads utilize data not only as a source of information but also as a strategic resource for planning, decision-making, monitoring, collaboration, and school improvement. While challenges remain, the findings indicate that effective data utilization is enhanced when supported by strong leadership, collaborative cultures, technological resources, and ethical practices.

The proposed THRIVE Framework offers a context-responsive model that supports school leaders in leveraging data to improve educational outcomes. By integrating evidence-based decision-making with collaboration, reflection, and ethical leadership, the framework provides a practical pathway toward sustainable school improvement.

Future studies may examine the implementation and effectiveness of the THRIVE Framework across diverse educational contexts and leadership environments.

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