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School Management Readiness for Strengthening Specialized Science Instruction Under the MATATAG Curriculum: A Conceptual Framework and Action-Plan Model

Rhea Mae B. Molina[1]

[1]Graduate School / Ilocos Sur Polytechnic State College – Santa Maria Campus / Ilocos Sur / Philippines

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Abstract: The MATATAG Curriculum reforms basic education in the Philippines by decongesting learning competencies and strengthening foundational learning from Kindergarten to Grade 10. Translating these policy directions into meaningful Science instruction requires school-level capacity to align teachers, curriculum implementation, and learning resources. This conceptual paper examines school management readiness for specialized Science instruction in junior high schools through a narrative synthesis of relevant policy documents, theoretical literature, and Philippine education studies. Guided by Instructional Leadership Theory, General Systems Theory, and the Resource-Based View, the paper organizes readiness into three interrelated dimensions: Instructional Leadership, Curriculum Management, and Resource Management. The synthesis identifies issues that warrant attention, including teacher-subject specialization mismatch, access to relevant professional development, curriculum coordination, resource functionality and accessibility, and the administrative conditions surrounding procurement and resource support. In response, the paper proposes a four-pillar action-plan model focused on workforce alignment and mentoring, learning tools and equipment usability and maintenance, instructional coaching, and inter-institutional partnerships. The framework is presented as a conceptual guide for school-level planning and future empirical validation; it does not report local school assessment results or claim that the proposed interventions have already been tested.

Keywords: *Curriculum Management; Instructional Leadership; MATATAG Curriculum; Resource Management; School Management Readiness; Specialized Science Instruction*.

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I. INTRODUCTION

Science education is essential to developing scientific literacy, critical thinking, problem-solving, and evidence-informed decision-making. The quality of Science instruction, however, depends on more than curriculum content and individual teacher effort. Schools also need organizational arrangements that support appropriate teacher deployment, coherent curriculum implementation, access to learning resources, and continuing instructional improvement. School management readiness therefore concerns the capacity of school leaders and personnel to coordinate these conditions so that curriculum expectations can be translated into purposeful classroom experiences.

In the Philippines, the Department of Education (DepEd) issued DepEd Order No. 010, s. 2024, which provides the policy guidelines for implementing the MATATAG Curriculum from Kindergarten to Grade 10. DepEd Order No. 012, s. 2024 subsequently amended selected provisions of the implementation guidelines. The policy coverage includes Key Stage 3, or Grades 7 to 10, which is the focus of this paper. The MATATAG Curriculum is implemented within the broader enhanced basic education framework established by Republic Act No. 10533 (2013) and is intended to decongest the curriculum and strengthen foundational learning. Its implementation nevertheless requires schools to organize instructional time, support teachers, and align available resources with the prescribed learning standards (Department of Education [DepEd], 2024a, 2024b). A national evaluation of the first-year pilot implementation also identified the importance of sustained instructional support, teacher training, learning-material provision, and coordination across grade levels (Abrigo et al., 2025).

One issue relevant to specialized Science instruction is the alignment between teachers' academic preparation and their assigned subjects. Science includes connected but

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distinct disciplinary fields, and teachers may encounter challenges when their preparation does not fully correspond to the content they are expected to teach. Research on Philippine Science teachers under the spiral progression approach documented challenges involving content, pedagogy, assessment, professional development, and school support (Orbe et al., 2018). More recent Philippine evidence also examined the relationship between teacher specialization and subject-taught mismatch, identifying implications for teaching effectiveness and student learning (Mejia et al., 2025). These studies support the need for thoughtful teacher assignment, professional learning, and instructional support; they do not imply that every junior high school has the same staffing condition.

A second concern is the availability and practical usability of Science learning tools and equipment (LTE). An inventory count alone cannot establish whether an item is safe, functional, appropriate to the lesson, maintained, and accessible when needed. For this reason, resource readiness should consider both the presence of materials and the conditions that allow teachers and learners to use them. Philippine research on the delivery of teaching and learning materials has documented procurement and supply-chain concerns within DepEd (Delos Reyes et al., 2025). That study focuses on learning materials generally and should not be treated as direct evidence of the condition of Science laboratory equipment. In this paper, equipment functionality, maintenance, safety, and access are therefore treated as proposed school-level assessment indicators rather than as established national findings.

School heads have an important role in setting instructional direction, coordinating curriculum implementation, and organizing resources to support teaching and learning. Instructional leadership emphasizes the principal's responsibility for defining school goals, managing the instructional program, and promoting a positive learning climate (Hallinger & Murphy, 1985). However, these responsibilities are carried out within wider policy, staffing, workload, funding, and procurement arrangements. Research on access to in-service training in the Philippine education system identifies inequities in access, inconsistent funding, workload, and logistical barriers as concerns for teacher professional development (Rivera et al., 2025). For public institutions, procurement must also be understood within the current legal framework. Republic Act No. 12009, or the New Government Procurement Act, revised Republic Act No. 9184; accordingly, current discussions of public procurement should not cite RA 9184 as the sole governing statute (Republic Act No. 12009, 2024).

The paper draws on three complementary theoretical perspectives. Instructional Leadership Theory explains how school leaders establish instructional goals, coordinate the curriculum, supervise teaching, and support professional growth (Hallinger & Murphy, 1985). General Systems Theory views the school as an interconnected organization in which resources, management processes, and instructional results influence one another (von Bertalanffy, 1968). The Resource-Based View highlights the importance of mobilizing and sustaining organizational resources so that they contribute to institutional goals (Barney, 1991). Used together, these perspectives explain why readiness cannot be reduced to a single indicator: leadership provides direction, curriculum management coordinates instructional work, and resource management makes the necessary support available and usable.

Despite the relevance of these perspectives, there is a need for a coherent conceptual account of how school-level management capacities can be organized to support specialized Science instruction under the MATATAG Curriculum. This paper addresses that need by presenting school management readiness as a multidimensional organizational capacity comprising Instructional Leadership, Curriculum Management, and Resource Management. It then translates these dimensions into a proposed four-pillar action-plan model. The paper does not treat readiness as a statistically tested mediator, nor does it claim to measure the readiness of particular schools. Its contribution is a literature-informed framework that can guide planning and subsequent empirical investigation.

II. MATERIALS AND METHODS

- *Research Design*

This paper uses a desk-based conceptual research design and narrative document synthesis. It does not present primary data, survey results, interviews, classroom observations, or an evaluation of identified schools. Instead, it brings together relevant policy instruments, foundational theoretical works, and Philippine education studies to develop a conceptual account of school management readiness for specialized Science instruction in junior high schools.

- *Research Strategy and Literature Extraction*

Documents were selected purposively for their relevance to at least one of the paper's central concerns: MATATAG Curriculum implementation, Science teacher specialization and subject assignment, instructional leadership, teacher professional development, learning-resource provision, and public procurement. The documentary base includes DepEd Orders No. 010 and 012, s. 2024; Republic Act No. 10533 and Republic Act No. 12009; foundational works on instructional leadership, systems theory, and the Resource-Based View; and relevant Philippine studies and policy research published primarily from 2018 to 2025. Priority was given to official government issuances, institutional research publications, and identifiable scholarly journal articles. This is a narrative conceptual synthesis, not a systematic or scoping review. It therefore does not claim exhaustive retrieval, a complete census of available studies, or a reproducible database search.

- *Data Synthesis and Framework Development*

The selected materials were examined for concepts, reported issues, and recommendations relevant to school management capacity. These were organized under three analytical dimensions: Instructional Leadership, Curriculum Management, and Resource Management. The dimensions were then connected to the three theoretical perspectives to clarify their complementary roles. Finally, recurring

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management needs and policy considerations were translated into four proposed action-plan pillars: workforce alignment and mentoring; LTE usability and maintenance; instructional coaching; and inter-institutional partnerships. The Input-Process-Output-Outcome logic was used as an organizing device: school and policy conditions constitute the inputs; leadership, curriculum coordination, and resource-management practices constitute the processes; the four-pillar action plan is the proposed output; and improved conditions for Science teaching and learning are the intended outcomes. These outcomes are propositions for future implementation and evaluation, not measured effects.

➢ *Ethical Considerations*

This conceptual study involved no human participants, personal information, or field intervention. Ethical practice was maintained through attribution of source materials, careful distinction between published evidence and the authors' conceptual interpretation, and avoidance of claims that would require uncollected school-level data. The paper also acknowledges that its narrative source selection is not exhaustive and that the proposed framework requires expert review and empirical validation before its effectiveness can be established.

III. RESULTS AND DISCUSSION

➢ *Baseline Institutional Dynamics: Teacher Specialization Mismatch and Resource Usability*

The literature indicates that teacher-subject alignment is an important consideration in Science instruction. Orbe et al. (2018) documented challenges experienced by Philippine Science teachers in teaching Chemistry within the spiral progression curriculum, including concerns related to content knowledge, pedagogy, assessment, training, and school support. The more recent analysis by Mejia et al. (2025) examined specialization and subject-taught mismatch in the Philippine education system and reported implications for teacher confidence, preparation time, pedagogical effectiveness, and student learning. Taken together, these studies support a management response that includes appropriate assignment decisions, identification of professional learning needs, and sustained mentoring. They do not establish the prevalence or specific pattern of mismatch in any school covered by this conceptual paper.

Resource readiness also requires a distinction between recorded availability and actual instructional usability. A school may list materials in an inventory, but their contribution to learning depends on condition, completeness, safety, relevance to the lesson, storage, and timely access. Delos Reyes et al. (2025) examined DepEd's book supply chain and identified broader challenges in the procurement and distribution of learning materials. Because the study concerns books and learning materials rather than Science laboratory equipment specifically, it is used here only to contextualize the importance of supply-chain and resource-delivery processes. The proposed framework consequently treats equipment audit, maintenance, safety, and accessibility as indicators that schools should examine locally, not as documented national conditions.

Table 1 presents the proposed conceptual dimensions and illustrative indicators that school leaders may examine when assessing readiness. The indicators are planning considerations and are not reported measurements.

Table 1 Conceptual Dimensions, Illustrative Indicators and Literature-Based Considerations

Conceptual Dimension	Illustrative Indicators	Literature-Based Considerations
Teacher Specialization and Support	Teacher qualifications and subject assignments; identified support needs; access to mentoring and professional development	Philippine studies report subject-taught mismatch and challenges among Science teachers; local patterns require school-level assessment (Orbe et al., 2018; Mejia et al., 2025; Rivera et al., 2025).
Science LTE Availability and Usability	Presence, condition, completeness, safety, relevance, maintenance, storage, and teacher access	Learning-resource supply processes matter, but the cited study concerns learning materials generally, not laboratory equipment (Delos Reyes et al., 2025).
Curriculum and Instructional Coordination	Collaborative planning; competency alignment; instructional time; assessment; coordination across grade levels	MATATAG implementation requires instructional support, teacher training, learning materials, and grade-level coordination (DepEd, 2024a, 2024b; Abrigo et al., 2025).

➢ *Three Core Dimensions of School Management Readiness*

The conceptual synthesis organizes school management readiness into three interrelated dimensions. The dimensions are analytically distinct but operate together: leadership establishes direction and support, curriculum management coordinates teaching and learning expectations, and resource management secures the conditions and materials required for instruction.

➢ *Instructional Leadership*

Instructional leadership concerns the actions through which school heads communicate learning priorities, monitor instruction, provide feedback, and promote teacher development. Hallinger and Murphy's (1985) framework emphasizes the management of the instructional program and the creation of a positive learning climate. In the context of specialized Science instruction, this dimension may include reviewing teacher assignment patterns, identifying areas where teachers need subject-specific support, facilitating professional learning communities, and ensuring that classroom observation is followed by constructive feedback. Research on Philippine teacher professional development highlights barriers involving access, funding, workload, and logistics (Rivera et al., 2025). Thus, professional development should be planned around identified instructional needs and supported by realistic schedules and resources.

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➢ *Curriculum Management*

Curriculum management refers to the school-level coordination of curriculum standards, learning competencies, instructional time, assessment, and the progression of content across grade levels. Under the MATATAG Curriculum, school leaders and teachers need shared processes for interpreting curriculum guides, preparing coherent instructional plans, and reviewing whether learning activities and assessments address the intended competencies (DepEd, 2024a, 2024b). The national pilot evaluation reported concerns related to instructional support, teacher training, learning-material delivery, and articulation of competencies across grade levels (Abrigo et al., 2025). Curriculum management should therefore include collaborative planning, periodic review of learning evidence, and coordination among Science teachers to avoid unnecessary gaps or repetition.

➢ *Resource Management*

Resource management concerns the identification, allocation, maintenance, and responsible use of resources that support Science teaching. From the Resource-Based View, resources create value when they are effectively mobilized in pursuit of organizational objectives (Barney, 1991). For schools, this means that resource planning should move beyond the preparation of inventory lists. A practical management cycle may include identifying curriculum-linked resource needs, checking the condition and completeness of equipment, ensuring safe storage and handling, planning maintenance and replenishment, and establishing clear procedures for teacher access. Public-school procurement planning must follow the applicable legal and regulatory requirements, including the New Government Procurement Act and its implementing rules (Republic Act No. 12009, 2024). These practices are proposed management considerations and should be adapted to each school's context.

➢ *Systemic Administrative Hurdles in Basic Education*

The literature and policy context point to several management concerns that may affect the implementation of specialized Science instruction. First, teacher-subject mismatch can create additional demands for preparation and professional support (Mejia et al., 2025; Orbe et al., 2018). Second, access to relevant professional development may be constrained by funding, workload, logistics, and uneven opportunities (Rivera et al., 2025). Third, curriculum reform requires instructional support, learning materials, and coordination across grade levels (Abrigo et al., 2025). Fourth, the procurement and delivery of learning resources involve institutional processes that can influence when materials become available for use (Delos Reyes et al., 2025). These concerns should not be interpreted as uniform conditions in all schools. Their actual presence and degree must be established through school-level assessment.

➢ *Sectoral Institutional Dynamics: Public vs. Private Secondary Schools*

The framework is intended to be applicable to junior high schools in both public and private settings, but it does not assume that the two sectors have identical governance arrangements or resource conditions. Public schools operate within government budgeting, procurement, and accountability requirements, including the legal framework established by RA 12009. Private schools operate under a different institutional and financing context, subject to applicable education regulations. The present documentary synthesis does not provide a sufficiently comparable evidence base to rank the two sectors or to claim that one consistently has better facilities, smaller classes, greater flexibility, or higher teacher turnover. Accordingly, the proposed framework identifies common management functions while requiring each school to assess its own authority, resources, constraints, and partnership opportunities.

➢ *Strategic Pillars of the Proposed Conceptual Action-Plan Framework*

Based on the three dimensions and the management concerns discussed above, the paper proposes four connected action-plan pillars. The pillars translate the conceptual analysis into areas for school-level planning. They are not interventions whose effectiveness has already been established; their feasibility and results should be assessed during future implementation.

Table 2 Strategic Pillars of the Proposed Conceptual Action-Plan Framework

Strategic Pillar	Key Objective	Proposed School-Level Actions	Responsible Stakeholders
Workforce Alignment & Mentoring	Align teacher preparation, assignments, and professional learning	Review qualifications and assignments; identify needs; organize mentoring and targeted learning	School Heads; Science Coordinators; Master Teachers; SDO Supervisors
LTE Usability & Maintenance	Keep Science resources functional, safe, relevant, and accessible	Audit resources; record condition; plan maintenance and replenishment; set safe access procedures	School Heads; Science Coordinators; Property Custodians; Supply Officers
Instructional Coaching	Strengthen instructional guidance for Science teachers	Use observation and feedback; facilitate collaborative planning; provide subject-specific coaching	School Heads; Master Teachers; Department Heads; Science Teachers
Inter-Institutional Partnerships	Expand access to expertise, facilities, and resources	Explore partnerships with LGUs, HEIs, science institutions, and community organizations; define roles and accountability	School Administrators; LGUs; HEIs; Science Institutions; Community Partners

The four pillars are designed to work as a coordinated management response. Workforce alignment and mentoring address the need to match teaching assignments with qualifications where possible and to provide structured support when a mismatch cannot immediately be avoided. LTE usability and maintenance focus on ensuring that

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recorded resources are functional, safe, relevant, and accessible. Instructional coaching connects classroom supervision with subject-specific feedback and professional learning. Inter-institutional partnerships provide a way to explore shared expertise, facilities, and resources when school capacity is limited. Implementation should begin with a local needs assessment, followed by prioritization, assignment of responsibilities, resource planning, monitoring, and periodic review. School leaders should adapt the proposed activities to their authority, school type, available resources, and applicable policies.

IV. CONCLUSION

This conceptual paper presents school management readiness as a multidimensional organizational capacity for supporting specialized Science instruction in junior high schools under the MATATAG Curriculum. The proposed framework brings together Instructional Leadership, Curriculum Management, and Resource Management. These dimensions emphasize that curriculum implementation depends on coordinated leadership, coherent instructional planning, teacher development, and the effective provision and use of learning resources. The literature reviewed identifies relevant concerns involving teacher-subject alignment, access to professional development, curriculum coordination, and resource-delivery processes. However, these concerns should not be generalized to every school without local evidence.

The proposed four-pillar action-plan model offers a planning structure for school heads, teachers, and education stakeholders. Its contribution is conceptual: it organizes relevant management responsibilities and suggests areas for local assessment and action. The framework has not yet been validated through expert review, field implementation, or outcome evaluation. Future research should assess its content validity, examine its applicability across different school contexts, and test whether implementation is associated with improvements in teacher support, resource usability, curriculum delivery, and learner outcomes. Such evidence is necessary before claims about the framework's effectiveness can be made.

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