

School Heads in the Advent of Digital Revolution

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ABSTRACT

This study assessed the technological competencies and readiness of secondary school heads in the implementation of the MATATAG Curriculum in the advent of the digital revolution. It employed a concurrent triangulation mixed-method research design involving 98 secondary school heads from the Schools Division Office of Bulacan for the quantitative phase and 18 selected secondary school heads for the qualitative phase. Quantitative data were gathered using a principal technology leadership assessment instrument with a reported Cronbach's alpha of 0.95, while qualitative data were obtained through interviews, observations, and supporting documents. The quantitative data were analyzed using IBM SPSS and descriptive statistics, while the qualitative data were examined through thematic analysis. Findings showed that school heads demonstrated

very high technological competencies across leadership and vision, learning and teaching, productivity and professional practice, support, management and operation, assessment and evaluation, and social, legal, and ethical issues. Their readiness for MATATAG implementation was expressed through understanding of curriculum design, particularly the 4Cs of context, connection, collaboration, and creativity, and through active curriculum engagement. The main challenges involved scarcity and readiness, resource and infrastructure limitations, human capital concerns, and gaps in technology access. Strategic responses included planning and alignment, capacity building, resource mobilization, digital culture development, adaptive pedagogy, and continuous monitoring. The study concluded that school heads were generally capable of leading technology-supported curriculum implementation, but sustained training, resources, and strategic support were needed. A three-pillar strategic framework was developed to strengthen future-ready digital leadership.

Keywords: *digital revolution, MATATAG Curriculum, school heads, strategic framework, technological competencies, technology readiness*

INTRODUCTION

The digital revolution has transformed educational leadership by requiring school heads to lead technology integration, support teachers, manage digital systems, and ensure that school programs remain responsive to changing learning conditions. In basic education, these expectations became more urgent as schools continued to use digital platforms, online communication, digitized records, and technology-supported instruction after the pandemic. Digital transformation in education is therefore not limited to devices or platforms; it also involves leadership vision, planning, culture-building, resource management, ethical technology use, and the capacity to guide teachers and learners in meaningful digital engagement.

In the Philippine context, the implementation of the MATATAG Curriculum intensified the need for school heads who can connect curriculum reform with digital leadership. The MATATAG agenda introduced a decongested curriculum, stronger emphasis on foundational skills, clearer articulation of 21st-century skills, values education, and alignment with international standards. DepEd memoranda on MATATAG training for teachers and school leaders in Central Luzon and the Schools Division Office of Bulacan emphasized the need to

equip school heads and teachers with competencies for the successful school-based implementation of the new curriculum.

The study recognized that school heads occupy a strategic position in curriculum implementation because they influence planning, professional development, technology support, assessment systems, stakeholder engagement, and innovation culture. Prior studies on digital leadership showed that the principal's technological leadership can influence teacher technological proficiency, attitudes toward change, and readiness to integrate technology in classroom practice (A'mar & Eleyan, 2022; Cantos & Callo, 2022; Hämäläinen et al., 2024; Karakose et al., 2021). However, the advent of the MATATAG Curriculum created a more specific leadership concern: how school heads demonstrate technological competencies and readiness while addressing challenges in implementing the new curriculum.

Within this context, the study assessed the technological competencies and readiness of secondary school heads in the Schools Division Office of Bulacan. It described technological competencies in terms of leadership and vision, learning and teaching, productivity and professional practice, support, management and operation, assessment and evaluation, and social, legal, and ethical issues. It also examined school heads' readiness in terms of curriculum design and engagement, the challenges they encountered, strategic approaches used to address those challenges, and the strategic framework that could enhance technological competencies, actions, and approaches in MATATAG Curriculum implementation.

Literature Review

Digital Revolution, School Leadership, and MATATAG Curriculum

The digital revolution in education requires school heads to become digital leaders who can plan, implement, and sustain technology-supported school practices. Copeland (2021) described digital transformation in schools through continuing practices such as digitized records, evaluation of digital tools, and strengthened technology security. Similarly, UNESCO (2023) emphasized that technology in education must be guided by responsible, equitable, and pedagogically meaningful use rather than by technology adoption alone.

The study drew from literature showing that digital leadership affects teachers' technology use and school-level innovation. A'mar and Eleyan (2022) found that principals' technology leadership was associated with teachers' technology integration, while Cantos and Callo (2022) linked school heads' technology leadership with teachers' technological proficiency and academic optimism. Karakose et al. (2021) likewise highlighted the importance of principals' digital leadership roles during the COVID-19 pandemic.

The MATATAG Curriculum added a curriculum-specific dimension to this leadership responsibility. The new curriculum required school heads to support teachers in curriculum design, learning engagement, technology-supported instruction, and 21st-century skills development. In this sense, digital readiness and MATATAG readiness became interrelated leadership concerns because curriculum implementation increasingly depended on the school head's ability to organize technology, guide teachers, and mobilize resources.

Technological Competencies of School Heads

The study was grounded in technology leadership standards and the Strategic Intelligence and Technology in Education framework. The International Society for Technology in Education and related technology leadership standards identify competencies such as leadership and vision, learning and teaching, productivity and professional practice, support and operations, assessment and evaluation, and social, legal, and ethical issues. Hashim and Yusup (2013) used similar domains in assessing school heads' technology leadership inclinations and activities.

Technology leadership is also supported by studies emphasizing the school head's role as a systems designer, learning facilitator, and barrier remover. Nalda et al. (2020) stressed the strategic influence of school principal leadership in digital transformation, while Al Nuaimi et al. (2024) emphasized the importance of principals' roles in digital transformation in education. These perspectives show that digital leadership requires both technical use and strategic governance.

The study also considered the Strategic Intelligence and Technology in Education perspective of Okoye et al. (2022), which links educational technologies, curriculum design, and learning outcomes. Under this view, school heads do not merely adopt tools; they analyze technology needs, guide curriculum-related decisions, and align innovations with institutional goals. This framework supported the study's focus on technological competencies within the implementation of the MATATAG Curriculum.

Readiness, Challenges, and Strategic Responses in Curriculum Implementation

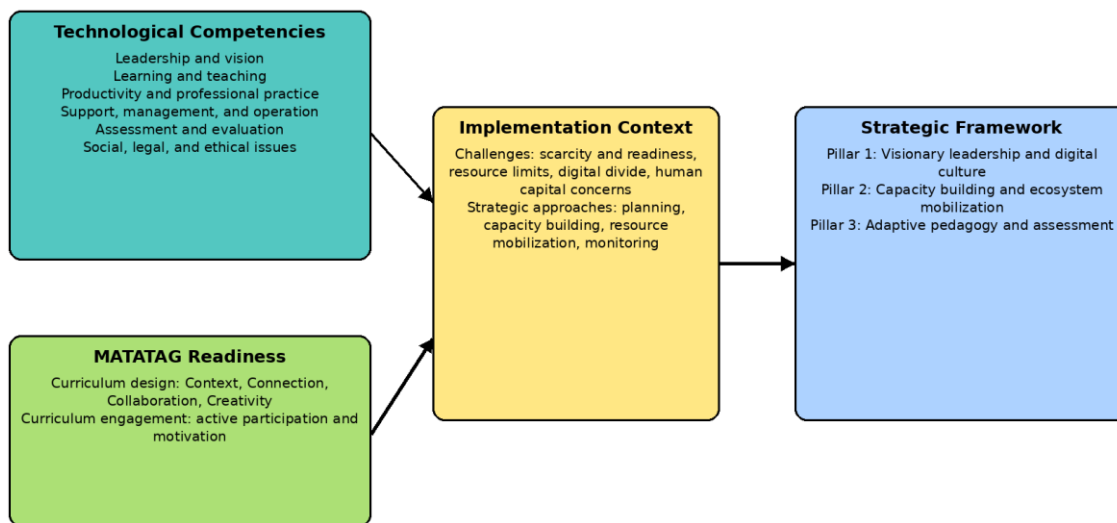
Readiness in this study referred to school heads' understanding of MATATAG Curriculum design and engagement. The design component included the 4Cs of context, connection, collaboration, and creativity, while engagement referred to active participation, motivation, and involvement in curriculum implementation. Literature on engagement emphasizes that active participation and motivation are central to meaningful learning and program implementation (Wigfield & Koenka, 2020).

The literature also showed that technological change produces both opportunities and barriers. Hanimoglu (2018) discussed the impact of technology on education, while Yehya (2021) described digital schools as part of an educational revolution. However, technology adoption may be constrained by access, resources, confidence, training, and institutional support. These issues are especially important in public schools where technology readiness depends on infrastructure, funding, staff capacity, and leadership commitment.

The source study therefore treated challenges not merely as obstacles but as inputs for strategic planning. By identifying school heads' challenges and strategic responses, the study developed a framework that could strengthen digital culture, capacity building, resource mobilization, adaptive pedagogy, assessment alignment, and continuous reflection. The literature on mixed methods also supported the concurrent triangulation design used to merge quantitative and qualitative evidence (Creswell & Plano Clark, 2007; Shorten & Smith, 2017).

Conceptual Framework of the Study

School heads' technological competencies and MATATAG readiness in the advent of the digital revolution



Based on the study's schematic diagram: competencies and readiness are shaped by challenges and strategic responses, leading to a strategic framework.

Figure 1. *Conceptual Framework of the Study*

METHODS

Research Design

The study employed a concurrent triangulation mixed-method research design. Quantitative and qualitative data were gathered within the same general period, analyzed separately, and merged to provide a more complete understanding of school heads' technological competencies and readiness in implementing the MATATAG Curriculum. The design was appropriate because the study required both statistical descriptions of school heads' technology leadership and qualitative explanations of challenges, strategic responses, and implementation experiences.

Research Locale

The study was conducted in the Schools Division Office of Bulacan. The locale included secondary schools across six Educational Districts. The setting was appropriate because school heads in the division were involved in digital technology use, curriculum implementation, and school-based preparation for the MATATAG Curriculum during the digital transformation of Philippine basic education.

Participants and Sampling Technique

For the quantitative phase, the study used universal sampling and involved 98 secondary school heads from the Schools Division Office of Bulacan. For the qualitative phase, purposive sampling was used to select 18 secondary school heads, with three participants from each Educational District. The qualitative participants were selected based on their role as school heads implementing the new curriculum and their experience in using digital technology in school projects and programs.

Table 1. *Summary of Respondents and Participants*

Phase	Participants	Number	Sampling Technique	Purpose
Quantitative	Secondary school heads in the Schools Division Office of Bulacan	98	Universal sampling	Assessed technological competencies across six domains
Qualitative	Selected secondary school heads from six Educational Districts	18	Purposive sampling	Explored MATATAG readiness, challenges, strategic approaches, and evidence of school actions

Research Instrument

The quantitative phase used a principal technology leadership assessment instrument with a reported Cronbach's alpha of 0.95. The instrument used a 4-point Likert scale and covered leadership and vision, learning and teaching, productivity and professional practice, support, management and operation, assessment and evaluation, and social, legal, and ethical issues. The instrument was adapted from a technology leadership assessment tool used in prior research on school heads' technology leadership.

The qualitative phase used interview questions aligned with the study's problem statement. The interviews examined school heads' understanding of the MATATAG Curriculum instructional design framework, the 4Cs, curriculum engagement, implemented projects and programs, challenges, strategies, and contingency plans. Supporting documents and evidence from the participants were also used to strengthen the qualitative findings.

Data Gathering Procedure

The researcher secured permission from Pampanga State University and the Schools Division Office of Bulacan. Consent was obtained from the participating school heads. Quantitative data were gathered through the 35-item survey questionnaire administered to 98 secondary school heads. At the same time, qualitative data were gathered through recorded interviews with 18 selected school heads, observations, and supporting documents related to school projects, programs, and contingency plans.

Data Analysis

Quantitative data were processed using IBM SPSS. Means and standard deviations were computed to describe the technological competencies of school heads across the six domains. The 4-point scale was interpreted

as Very High, High, Low, and Very Low based on the source study's interpretation guide. Qualitative data were analyzed through thematic analysis involving familiarization, coding, theme generation, review, definition, and interpretation. The quantitative and qualitative findings were merged to formulate conclusions and develop the strategic framework.

Ethical Consideration

The study observed informed consent, voluntary participation, confidentiality, and compliance with the Data Privacy Act. Participants were informed of the purpose and objectives of the study, their right to continue or withdraw, and the recording of interviews. The researcher also secured ethics clearance from the Graduate School Research Laboratory to protect the rights and welfare of the participants.

RESULTS AND DISCUSSION

Technological Competencies of School Heads

The findings showed that school heads demonstrated very high technological competencies across all domains measured in the quantitative phase. The strongest domain was productivity and professional practice, followed by learning and teaching, social, legal, and ethical issues, assessment and evaluation, leadership and vision, and support, management and operation as reported in the source table. These results suggest that the school heads were actively using technology for administrative work, communication, professional learning, instructional support, and responsible digital practices.

Table 2. *Summary of School Heads' Technological Competencies*

Technology leadership domain	Grand Mean	SD	Interpretation	Key implication
Leadership and Vision	3.31	0.64	Very High	School heads participated in planning, promoted stakeholder involvement, and identified best practices in technology use.
Learning and Teaching	3.54	0.53	Very High	School heads supported teachers in using technology for assessment, instruction, and professional development.
Productivity and Professional Practice	3.57	0.47	Very High	School heads used technology for daily tasks, records, communication, and professional learning.
Support, Management, and Operation	3.17	0.81	Very High	School heads supported technology systems, funding, upgrades, and district-level technical assistance.
Assessment and Evaluation	3.40	0.53	Very High	School heads promoted data systems and evaluated instructional and administrative technology practices.
Social, Legal, and Ethical Issues	3.45	0.53	Very High	School heads addressed equity, online safety, privacy, copyright, and responsible technology use.

The results are consistent with the view that technology leadership depends on both vision and operational practice. While the school heads showed very high engagement in all domains, the results also indicate that technology leadership must be continuously sustained through planning, professional development, infrastructure support, evaluation, and ethical safeguards. These findings support the literature emphasizing the principal as a key agent in school digital transformation (Al Nuaimi et al., 2024; Hämäläinen et al., 2024; Nalda et al., 2020).

Readiness for MATATAG Curriculum Implementation

The qualitative findings showed that school heads understood the MATATAG Curriculum through two broad readiness areas: curriculum design and curriculum engagement. In terms of design, participants described the 4Cs as context, connection, collaboration, and creativity. Context referred to localization, relevance, and data-driven adaptation. Connection referred to linking lessons with real-life experiences, interdisciplinary learning, and prior knowledge. Collaboration involved teacher teamwork, stakeholder partnership, and student cooperative

learning. Creativity involved innovative instructional design, critical and creative thinking, and monitoring for capacity building.

In terms of engagement, school heads viewed the curriculum as requiring active involvement, motivation, participation, and dynamic strategies. Engagement was not treated as passive attendance but as active participation among school heads, teachers, learners, and stakeholders. The findings indicate that readiness for the MATATAG Curriculum requires both technical understanding of the design framework and actual participation in curriculum-related activities.

Table 3. *Summary of MATATAG Curriculum Readiness Themes*

Readiness area	Emergent themes	Meaning in the study	Implication for school heads
Curriculum Design	Context, Connection, Collaboration, Creativity	The 4Cs guided how school heads understood lesson design, localization, interdisciplinarity, teamwork, and innovation.	School heads need to guide teachers in designing learner-centered, contextualized, and creative instruction.
Curriculum Engagement	Active participation, motivation, 4Es, professional development	Engagement involved the actual participation of school heads, teachers, and learners in curriculum implementation.	School heads need to sustain teacher empowerment, INSET, LAC sessions, monitoring, and feedback.

Challenges Encountered in Implementing the MATATAG Curriculum

The challenges encountered by school heads were grouped into two major themes: scarcity and readiness, and the driving opportunity. Scarcity and readiness captured internal and external constraints affecting schools, including limited devices, unstable internet connectivity, lack of updated materials, limited preparedness among teaching and non-teaching personnel, and inconsistent access to digital tools. These concerns reflected the continuing digital divide that affected technology-supported curriculum implementation.

At the same time, the challenges also created opportunities for transformation and collaborative growth. The MATATAG Curriculum pushed school heads and teachers to innovate instruction, build digital skills, strengthen teamwork, and mobilize community support. The study therefore framed challenges as both barriers and drivers of strategic action.

Table 4. *Challenges and Opportunities in MATATAG Curriculum Implementation*

Theme	Sub-theme	Description	Resulting need
Scarcity and Readiness	Resource and infrastructure limitations	Schools encountered limited devices, unstable internet access, and inadequate or outdated instructional materials.	Infrastructure support, digital resource development, and technology access plans
Scarcity and Readiness	Human capital and institutional readiness	Teachers and non-teaching personnel varied in preparedness to apply technology in school services and instruction.	Training, mentoring, and technical assistance
Driving Opportunity	Pedagogical and digital innovation	Digital transformation encouraged new teaching strategies, 21st-century skills, and creative use of learning tools.	Innovation culture and adaptive pedagogy
Driving Opportunity	Leadership and collaboration	Challenges strengthened school heads' need for partnerships, teamwork, and stakeholder engagement.	Collaborative planning and community resource mobilization

Strategic Approaches Used by School Heads

To address implementation challenges, school heads used several strategic approaches. These included strategic planning and alignment, capacity building, resource mobilization, infrastructure development, digital resource development, stakeholder engagement, monitoring, evaluation, and sustainability practices. These strategies show that school heads addressed digital transformation not only through technology acquisition but also through leadership, collaboration, policy, and continuous improvement.

The qualitative findings emphasized that school heads relied on teacher training, workshops, peer support, mentoring, grants, community partnerships, and offline or hybrid solutions. These strategies enabled schools to respond to connectivity concerns, limited devices, staff readiness, and resistance to change while maintaining the goals of the MATATAG Curriculum.

Table 5. *Strategic Approaches Utilized by School Heads*

Strategic area	Key actions	Purpose	Expected contribution
Strategic planning and alignment	Revisit school vision, align curriculum plans with digital competencies, and develop long-term technology plans	Clarify direction before implementation	More coherent technology-supported curriculum implementation
Capacity building	Conduct training, workshops, LAC sessions, peer mentoring, and professional development	Build teacher and staff readiness	Improved confidence and classroom application
Resource mobilization	Seek grants, community support, LGU partnerships, shared devices, and mobile learning stations	Address limited equipment and funding	Improved access to technology and learning continuity
Adaptive pedagogy	Promote blended learning, personalized learning, gamification, and digital instructional tools	Connect technology use to learning outcomes	More learner-centered MATATAG instruction
Monitoring and sustainability	Use feedback, evaluation, policies, and reflection cycles	Check implementation progress and safety	Sustained and responsible technology integration

Constructed Strategic Framework

Based on the quantitative and qualitative findings, the study developed a strategic framework for technological readiness of school heads. The framework was organized through an input-process-output structure and three operational pillars: Visionary Leadership and Digital Culture, Capacity Building and Ecosystem Mobilization, and Adaptive Pedagogy and Assessment. These pillars represent actions before, during, and after MATATAG Curriculum implementation.

Table 6. *Strategic Framework for Technological Readiness of School Heads*

Framework pillar	Focus	Key actions	Expected outcome
Pillar 1: Visionary Leadership and Digital Culture	Planning and change management	Set a digital vision, align technology use with MATATAG goals, model digital tools, advocate ethical use, and develop school policies	Shared digital direction, reduced resistance, and safer technology use
Pillar 2: Capacity Building and Ecosystem Mobilization	Development and resource support	Implement sustained professional development, maximize limited ICT resources, mobilize grants and partnerships, and prepare offline/hybrid contingency plans	Stronger teacher readiness, broader resource access, and resilient implementation
Pillar 3: Adaptive Pedagogy and Assessment	Classroom application and continuous improvement	Guide contextualized learning tools, innovation feedback loops, assessment alignment, and data-based reflection	Technology-supported learning outcomes and responsive curriculum implementation

Overall, the findings show that school heads were already highly engaged in technology leadership, but the strategic framework remains necessary because high competency does not eliminate implementation barriers. The framework provides a practical cycle for clarifying vision, building capacity, mobilizing resources, applying adaptive pedagogy, and sustaining reflective improvement. This aligns with studies emphasizing that school digital transformation requires leadership, digital culture, resource systems, and professional learning (Al Nuaimi et al., 2024; Hämäläinen et al., 2024; UNESCO, 2023).

CONCLUSION

The study concludes that secondary school heads in the Schools Division Office of Bulacan possessed a very high level of technological competencies in the advent of the digital revolution. Their competencies were evident in leadership and vision, learning and teaching, productivity and professional practice, support, management and operation, assessment and evaluation, and social, legal, and ethical issues. These competencies indicate that school heads were capable of using technology to support planning, instruction, administration, communication, evaluation, and responsible digital citizenship.

The study further concludes that readiness for MATATAG Curriculum implementation requires both understanding and active participation. School heads understood the curriculum through the 4Cs of context, connection, collaboration, and creativity, and they recognized engagement as active involvement among school heads, teachers, learners, and stakeholders. However, the implementation of technology-supported curriculum reform was affected by resource limitations, readiness gaps, digital divide concerns, and internal and external management constraints.

Finally, the study concludes that the constructed three-pillar framework provides an operational blueprint for future-ready school leadership. Visionary leadership and digital culture, capacity building and ecosystem mobilization, and adaptive pedagogy and assessment can guide school heads in planning, implementing, monitoring, and sustaining technology-supported MATATAG Curriculum implementation.

Recommendation

School heads should continue integrating technology into school operations, instructional supervision, communication, assessment, and program implementation. They should use technology not only for administrative convenience but also for improving teaching, learning, curriculum alignment, and stakeholder engagement.

The Schools Division Office of Bulacan and school administrators should provide sustained professional development on digital leadership, MATATAG Curriculum design, instructional technology, data privacy, assessment tools, and adaptive pedagogy. Training should be complemented by coaching, mentoring, LAC sessions, peer learning, and school-based technical assistance.

Schools should develop contingency plans for digital transformation challenges, including limited devices, weak internet connectivity, resistance to change, and gaps in teacher or staff readiness. School heads should mobilize grants, LGU support, community partnerships, and shared resource systems to improve access to technology and ensure learning continuity.

The strategic framework developed in the study may be adopted, modified, and localized by school heads and planning teams. Its three pillars may guide schools in establishing a digital vision, building capacity, mobilizing resources, aligning pedagogy and assessment, and sustaining reflective improvement in MATATAG Curriculum implementation. Future researchers may conduct comparative studies across divisions, validate the framework in other school contexts, and examine the long-term effects of school heads' digital leadership on teacher practice and learner outcomes.

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