An Exploratory Factor Analysis of the Dimensions of Adaptive Management Among Secondary School Heads Amidst Crises

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Abstract

To better understand how school leaders respond to crises, this study investigated the underlying dimensions of adaptive management among secondary school heads using Exploratory Factor Analysis (EFA). A 40-item Likert-scale instrument was developed based on qualitative insights from interviews with 12 school heads and validated using responses from 268 teachers. Content validity was ensured through review by educational management specialists, while a pilot test with teachers in Region XI confirmed effectiveness. Reliability testing yielded a Cronbach's Alpha of 0.98 and a mean inter-item correlation of 0.57, indicating excellent internal consistency. The dataset demonstrated excellent sampling adequacy (KMO = 0.916) and strong factorability (Bartlett's Test, $p < .001$), confirming its suitability for EFA. Four coherent dimensions of adaptive management emerged, accounting for 72.7% of the total variance: 1) actual implementation of learning continuity plans and protocols, 2) collaborative evaluation and continuous learning, 3) data-driven planning and prioritization, and 4) operational implementation and coordination. Despite acceptable item loadings, model fit indices (e.g., RMSEA = 0.148; TLI = 0.683) suggest the need for further refinement of the factor structure. These findings contribute to a novel, empirically derived framework for understanding adaptive crisis leadership in schools, highlighting adaptive management as a multidimensional construct encompassing strategic, operational, and collaborative competencies. Future research may employ Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) to validate and refine this framework across broader educational contexts.

Keywords: Adaptive Management, School Heads, Exploratory Factor Analysis, Crisis

Introduction

Adaptive management involves continuous monitoring, evaluation, and adjustment, making it vital during crises when leaders must act swiftly while maintaining stability (Månsson et al., 2023; Kwatubana & Molaodi, 2021). Globally, education systems rapidly shifted to online, remote, and hybrid learning, as seen in South Korea and elsewhere (The Latin American and Caribbean Economic System, 2020). These disruptions exposed the limits of traditional leadership, pushing school leaders to adopt more flexible and responsive strategies.

In the Philippines, DepEd introduced the Basic Education Learning Continuity Plan (BE-LCP) to sustain learning during disruptions, covering core competencies, flexible modalities, safety protocols, and work arrangements (Department of Education, Republic of the Philippines, 2020). In Davao Region, the learning institutions implemented modular (Lapesigue, 2024), blended (Pregoner & Baguio, 2024) and homeschooling (Hangad, 2024) approaches yet challenges such as limited technology, weak management capacity, and resource constraints persisted (Inter-agency Network for Education in Emergencies, 2020).

Crises underscored the complexity of educational leadership, with some school heads managing uncertainties effectively while others struggled, often relying on intuition and support to cope (Dirani et al., 2020). Tasked with maintaining teaching and learning continuity during crises such as typhoons, floods, earthquakes, and health

emergencies (Angwas, 2025), many admitted being unprepared for such demands (National Association of Elementary School Principals, 2020), highlighting the need to examine how they adapted to crisis management.

Secondary schools in Region XI have experienced significant leadership challenges during crises, necessitating adaptive management strategies to sustain quality education. Reyes and Prado (2025) found that academic leaders demonstrated high levels of crisis leadership, particularly in compassion and timely decision-making. Similarly, Diaz and Pidor (2022) reported that school heads exhibited very high management competence, with organizational citizenship behavior significantly related to effective crisis response. While these studies highlight adaptive practices such as stakeholder involvement and resource management, they also point to gaps in structured, context-specific crisis leadership frameworks, underscoring the need for further research in Region XI.

This study draws on the Adaptive Management Cycle (Department of Primary Industries, Parks, Water and Environment, 2016) which emphasizes planning, implementation, evaluation, learning, and adjustment to navigate uncertainty in education. Timely and relevant, it provides practical benchmarks for school heads in crisis contexts, focusing on agility, contextual awareness, and adaptive leadership. Aligned with SDG 4 (Quality Education) and SDG 13 (Climate Action), it advances inclusive and resilient education systems. The study further contributes to an empirically grounded framework with four dimensions of adaptive management—implementation of learning continuity plans, collaborative evaluation, data-driven planning, and operational coordination—to inform leadership development, policy, and school governance reforms.

The introduction identifies critical gaps in the literature on crisis leadership in educational institutions, particularly the absence of structured and context-specific frameworks applicable to Region XI, Philippines. Existing studies reveal a limited understanding of how school heads systematically adapt to crises, with leadership responses often varying widely and, in some cases, relying more on intuition than on evidence-based or organized approaches. Moreover, there is insufficient guidance on integrated crisis leadership models that account for diverse and recurring emergency contexts. These gaps are consistent with the findings of Bellibaş and Karaferye (2025), who highlighted the lack of cross-crisis, integrated, and synthesized evidence to support effective crisis management practices among school leaders. Addressing these limitations, the present study seeks to develop an empirically grounded crisis leadership framework anchored in adaptive management, emphasizing four key dimensions: implementation of learning continuity plans, collaborative evaluation, data-driven planning, and operational coordination.

Objectives of the Study

The objective of this study is to examine the adaptive management practices of secondary school heads during crises—such as natural disasters, health emergencies, and security threats—as perceived by the school heads and triangulated by the teacher-respondents from Basic Education secondary schools in Region XI.

Research Questions

This study aims to answer the research question below:

1. What are the underlying dimensions of adaptive management demonstrated by school heads during crises, as perceived by teacher-respondents in Basic Education secondary schools in Region XI?

Methods and Materials

Research Design

This study used a quantitative design with Exploratory Factor Analysis (EFA) to identify the underlying dimensions of adaptive management among secondary school heads during crises guided with the Adaptive Management Adaptive Management Cycle (Department of Primary Industries, Parks, Water and Environment, 2016). Grounded in empiricist and positivist paradigms, quantitative research emphasizes systematic data collection, hypothesis testing, and theory validation (Ghanad, 2023; Bryman, 2016). EFA allowed the study to uncover latent constructs and distill complex behaviors into core dimensions, providing insights into school leaders' adaptive strategies (Goudarzian, 2023).

Sampling Procedure

A sample of 268 teachers was determined using Raosoft Sample Size Calculator (Ellen, 2022) from a population of 812 teachers across five schools in Davao del Norte in 2025. Respondents were proportionally drawn from each school, whose heads also joined in-depth interviews on adaptive management during crises. The sample size meets the recommended subject-to-variable ratio for EFA (Hair et al., 2019), ensuring reliable factor structures, minimizing error, and strengthening statistical power. Inclusion of teachers from both large and small schools enhances external validity and generalizability of findings.

Research Instrument

The study utilized a researcher-developed 40-item structured questionnaire to assess adaptive management in secondary schools during crises, following principles of instrument development outlined by Creswell (2014). Items were derived from interviews with 12 school heads, contextualized for the local setting based on the Adaptive Management Cycle (Department of Primary Industries, Parks, Water and Environment, 2016), and refined through expert validation. Content validity was ensured through review by educational management specialists, while a pilot test with teachers in Region XI confirmed effectiveness. Reliability testing yielded a Cronbach's Alpha of 0.98 and a mean inter-item correlation of 0.57, indicating excellent internal consistency. Responses were gathered using a 5-point Likert scale (5-Always to 1-Never), enabling quantifiable analysis, including factor analysis.

Data Gathering Procedure

The study employed the survey method described by Creswell (2014), using a researcher-developed questionnaire as the main instrument. Formal approval was secured from the Schools Division Superintendents, followed by authorization from five selected public secondary schools. The questionnaire was distributed to 268 secondary school teachers through online platforms (Messenger, email, & Google Forms), with the study's purpose and significance clearly explained to ensure informed participation. The process was monitored to address concerns and provide timely responses. Completed questionnaires were then collected and organized for analysis. To enrich the dataset, semi-structured interviews with school heads were also conducted.

Data Analysis

The data were analyzed using Exploratory Factor Analysis (EFA) to identify dimensions of adaptive management among school heads during crises, following Fabrigar and Wegener (2012) and Osborne (2014). A 40-item Likert-scale tool, developed from interviews with 12 school heads and validated by 268 teacher responses, was processed through Principal Component Analysis (PCA) with Varimax rotation (Field, 2018; Hair et al., 2019). Varimax rotation was used to maximize the variance of loadings across factors, simplifying the interpretation of the factor structure (Hair et al., 2019). Sampling adequacy (KMO > 0.50), variable correlations (Bartlett's Test,

$p < .05$), item suitability (MSA > 0.50), and variance explanation (communalities > 0.50) were confirmed before interpretation. Items not meeting these criteria were removed, and EFA was rerun until stable factors were established.

Results

Dimensions of Adaptive Management Among Secondary School Heads Amidst Crises

A 40-item Likert-scale questionnaire, developed from interviews with 12 school heads, was administered to 268 teachers to validate and analyze adaptive management dimensions through EFA guided with the Adaptive Management theory used in this study. Data suitability was confirmed with a KMO value of 0.916 (excellent sampling adequacy) and Bartlett's Test of Sphericity ($\chi^2 = 15{,}492$, df = 780, $p < .001$), both indicating strong inter-item correlations. These results justified the use of EFA, ensuring robust psychometric properties and reliable identification of latent factors.

Root Mean Square Error of Approximation (RMSEA)

The RMSEA of 0.148 (90% CI: 0.145-0.153) exceeds the 0.08 threshold, indicating poor fit, supported by a low Tucker-Lewis Index (TLI) of 0.683(< 0.90). The model yielded $\chi^2 = 4322$, df = 626, $p < .001$, and BIC = 822. Although the significant chi-square is expected with large samples, overall indices suggest the factor model needs refinement to capture the data's structure better.

EFA to Determine the Dimensions of Adaptive Management Among Secondary School Heads Amidst Crises

An Exploratory Factor Analysis (EFA) was conducted to determine the underlying dimensions of the Adaptive Management instrument for secondary school heads amidst crises. The principal factor analysis results (Table 1) revealed a clear four-factor structure, indicating that the instrument is multidimensional. Dimension 1, *Actual Implementation of Learning Continuity Plans and Protocols*, yielded a sum of squared loadings of 8.28 and explained 20.7% of the total variance. Dimension 2, *Collaborative Evaluation and Continuous Learning*, accounted for an additional 18.4% of the variance, increasing the cumulative explained variance to 39.1%. Dimension 3, *Data-Driven Planning and Prioritization in School Crisis Response*, contributed 17.7%, raising the cumulative variance to 56.8%. Finally, Dimension 4, *Operational Implementation and Coordination of School Continuity Plans*, explained a further 15.9%, resulting in a total cumulative variance of 72.7%. This high proportion of explained variance indicates that the four-factor solution adequately captures the underlying structure of adaptive management practices among school heads during crises.

Table 1 Principal factor analysis summary

Dimension	SS Loadings	% of Variance	Cumulative %
1. Actual implementation of learning continuity plans and protocols	8.28	20.7	20.7
2. Collaborative evaluation and continuous learning	7.37	18.4	39.1
3. Data-driven planning and prioritization in school crisis response	7.07	17.7	56.8
4. Operational implementation and coordination of school continuity plans	6.37	15.9	72.7

Item loadings further support the construct validity of the instrument. Items with factor loadings above 0.40 demonstrated strong associations with their respective dimensions, with Items 26, 25, and 29 loading on Dimension 1; Items 13, 11, and 18 on Dimension 2; Items 40, 37, and 36 on Dimension 3; and Items 2, 6, and 15 on Dimension 4. A small number of items (e.g., Items 31 and 19) exhibited cross-loadings, suggesting conceptual overlap across dimensions, which is theoretically consistent with the interconnected nature of adaptive

management practices. The uniqueness values indicate that most items were well explained by the extracted factors, further confirming the adequacy and structural coherence of the instrument.

Rotated Component Matrix (RCM)

Table 2 presents the RCM derived from an EFA, which aims to identify the underlying dimensions that group together various items in the dataset. The analysis employed the *minimum residual* extraction method, along with a *varimax rotation*. This orthogonal technique maximizes the variance of factor loadings, thereby interpreting factors more distinctly and easily. Each item in the table represents a survey question or indicator, along with the numbers under each dimension (labeled 1 through 4), which indicate the factor loadings — that is, the correlation between the item and the respective factor.

Table 2 Rotated component matrix

No.	Dimension				Uniqueness
	1	2	3	4	
Item 26	0.851				0.124
item 25	0.755				0.267
Item 29	0.695				0.195
Item 32	0.690				0.173
Item 22	0.668				0.293
Item 30	0.635				0.271
Item 31	0.625	0.525			0.181
Item 24	0.619	0.567			0.208
Item19	0.608	0.605			0.190
Item 33	0.603		0.519		0.184
Item 10	0.592	0.531			0.248
Item 9	0.529				0.362
Item 27	0.500				0.387
Item 13		0.722			0.141
Item 11		0.692			0.187
Item 18		0.614			0.386
Item 17		0.609			0.205
Item 16		0.595			0.288
Item 20	0.510	0.553			0.223
Item 12		0.549			0.252
Item 21		0.515			0.266
Item 14					0.562
Item 40			0.785		0.181
Item 37			0.769		0.212
Item 36			0.754		0.168
Item 34			0.684		0.168
Item 35			0.670		0.157
Item 38			0.648		0.339
Item 39			0.582		0.511
Item 23			0.554		0.300
Item 28					0.363
Item 2				0.719	0.266

Table 2 (Cont.)

No.	Dimension				Uniqueness
	1	2	3	4	
Item 6				0.667	0.245
Item 15				0.666	0.237
Item 4		0.541		0.659	0.175
Item 7				0.592	0.317
Item 1				0.591	0.415
Item 5				0.579	0.253
Item 3				0.550	0.603
Item 8				0.468	0.405

Note: The 'Minimum residual' extraction method was used in combination with a 'varimax' rotation.

In times of crisis, such as natural disasters, health emergencies, or socio-political disruptions, adaptive management becomes a critical leadership competency among school heads. The data reveal that school leaders adopt a range of strategic and responsive actions to maintain safe, continuous, and effective school operations. The factor scores reflect the extent to which these practices are consistently applied, with higher scores indicating greater emphasis and integration into adaptive management amidst crises.

Dimension 1: Actual Implementation of Learning Continuity Plans and Protocols

Table 3 shows 13 items under Dimension 1. Items 26 and 25, with loadings above 0.70, highlight strong practices such as implementing health and safety protocols (0.851) and employing flexible work arrangements (0.755). Other items, with loadings above 0.50, reflect priorities like assessing resources (0.695), adhering to safety guidelines (0.690), establishing partnerships (0.625), securing resources (0.635), and proactive communication (0.629). School heads also emphasize composure, use of digital platforms, and engaging personnel in DepEd directives, while even lower-scoring items (e.g., studying directives at 0.529) remain vital. Overall, these findings underscore adaptive management rooted in compliance, communication, collaboration, composure, and resource assessment, enabling resilience and continuity during crises.

Table 3 Factor structure using rotated component matrix for Dimension 1: Actual implementation of learning continuity plans and protocols

No.	Item Statements	Factor Score	Dimension
26	Implement health and safety protocols within the school	0.851	Actual implementation of learning continuity plans and protocols
25	Employ flexible work arrangements for all teaching and non-teaching personnel	0.755	
29	Assess both human and material resources available in the school	0.695	
22	Evaluate existing assets and resources to support school operations	0.668	
32	Strictly adhere to national and local health and safety guidelines	0.69	
31	Establish partnerships with internal and external stakeholders	0.625	
30	Secure essential resources necessary for the delivery of basic education services	0.635	
24	Communicate proactively with stakeholders and community partners to ensure a shared understanding of the school's needs	0.629	
19	Maintain composure and communicate clearly with personnel regarding new processes to address urgent challenges	0.608	
33	Utilize digital platforms to sustain the implementation of school programs, projects, and activities (PPAs)	0.603	
10	Engage school personnel in the execution of relevant DepEd Orders and Memoranda	0.592	

Table 3 (Cont.)

No.	Item Statements	Factor Score	Dimension
9	Study DepEd directives from central, regional, and division offices as references for implementation	0.529	
27	Remain calm and focused on managing and executing school operations effectively	0.5	

Dimension 2: Collaborative Evaluation and Continuous Learning

Table 4 presents nine items under Dimension 2, emphasizing reflection, shared decision-making, and improvement through collaboration and resource optimization. The strongest loadings include establishing stakeholder connections (0.722) and communicating changes with clarity and optimism (0.692), showing the value of inclusive partnerships and effective communication. Other items reflect responsible resource use (0.614), timely assessment of needs (0.609), and collective problem-solving through planning teams (0.595). Practices like engaging partners (0.553), providing technical assistance (0.549), conducting needs analyses (0.515), and benchmarking (0.456) further demonstrate continuous learning and professional development. Overall, this dimension highlights school heads' ability to foster resilience, shared responsibility, and adaptive strategies through collaboration and ongoing evaluation.

Table 4 Factor structure using rotated component matrix for Dimension 2: Collaborative evaluation and continuous learning

No.	Item Statements	Factor Score	Dimension
13	Establish strong connections with internal and external stakeholders to address instructional and operational needs collaboratively	0.722	Collaborative evaluation and continuous learning
11	Communicate changes to school personnel with clarity and optimism to foster adaptability and a positive mindset	0.692	
18	Purchase whatever can be bought with due consideration to the existing MOOE allocations and the existing guidelines that surround it	0.614	
17	Conduct a timely assessment of material and resource needs to address emerging challenges effectively	0.609	
16	Assemble the planning team immediately to discuss the current issues and develop solutions	0.595	
20	Engage with internal and external partners to collaboratively find solutions to arising problems	0.553	
12	Provide consistent technical assistance to school personnel through regular School Learning Action Cell (SLAC) sessions	0.549	
21	Conduct a needs analysis to assess the current school context and priorities accurately	0.515	
14	Undertake benchmarking activities to learn from the best practices of other schools and adapt relevant strategies	0.456	

Dimension 3: Data-Driven Planning and Prioritization in School Crisis Response

Table 5 highlights practices showing how school leaders use data to plan, adjust, and prioritize during crises. The strongest loadings include implementing the Learning Continuity Plan (0.785) and revisiting the School Improvement Plan to address current needs (0.769), underscoring adaptive planning. Other key practices involve applying SMEA guidelines (0.754), revising improvement plans (0.684), mobilizing resources (0.670), and providing technical assistance through benchmarking (0.648). Collaboration also plays a role, with leveraging partnerships (0.582) and consulting key personnel (0.554) supporting informed decision-making. Even at a lower

loading, prioritizing the continuous delivery of education (0.474) reflects the core focus of sustaining access. Collectively, these findings highlight strategic, data-driven, and collaborative approaches to school crisis response.

Table 5 Factor structure using rotated component matrix for Dimension 3: Data-driven planning and prioritization in school crisis response

No.	Item Statements	Factor Score	Dimension
40	Implement the Learning Continuity Plan at the school level	0.785	Data-driven planning and prioritization in school crisis response
37	Revisit the School Improvement Plan and employ prioritization on the present needs or adjustments to address the present condition	0.769	
36	Utilize the guidelines and mechanics of the School Monitoring, Evaluation, and Adjustment (SMEA)	0.754	
34	Revise the school improvement plan and set goals, or adjust it to address the present needs	0.684	
35	Strengthen resource mobilization to address the accomplishments of the PPAs	0.67	
38	Provide technical assistance through intervention and benchmarking	0.648	
39	Leverage partnerships with external and internal stakeholders	0.582	
23	Plan and consult with key personnel to address any arising problems	0.554	
28	Focus on prioritizing the continuous delivery of basic education services	0.474	

Dimension 4: Operational Implementation and Coordination of School Continuity Plans

Table 6 shows that Dimension 4 highlights school leaders' capacity to operationalize continuity plans during crises. Strong loadings include reproducing and monitoring SLMs for accessibility (0.719) and prioritizing safety and wellbeing (0.667). Other key practices are aligning activities with DepEd policies (0.666), providing technical assistance via SLAC sessions (0.659), and convening planning teams for updates (0.592). Additional contributions involve enforcing health protocols (0.591), building partnerships (0.579), and adopting flexible work arrangements (0.550). Even with a lower loading, collaboration with partners (0.468) underscores the value of coordination. Collectively, these practices reflect policy alignment, safety, collaboration, and adaptability as pillars of effective continuity implementation.

Table 6 Factor structure using rotated component matrix for Dimension 4: Operational implementation and coordination of school continuity plans

No.	Item Statements	Factor Score	Dimension
2	Reproduce and monitor Self-Learning Modules (SLMs) in various media formats to ensure accessibility for all learners	0.719	Operational implementation and coordination of school continuity plans
6	Prioritize the safety and wellbeing of learners and school personnel in the delivery of instruction and management of school operations	0.667	
15	Align the implementation of school activities with relevant DepEd Memoranda and Orders	0.666	
4	Provide technical assistance to school personnel through structured SLAC (School Learning Action Cell) sessions	0.659	
7	Convene the planning team to formulate and update the School Continuity Plan in response to emerging challenges	0.592	
1	Implement and strictly observe health and safety protocols within the school premises	0.591	
5	Establish and strengthen internal and external partnerships to support identified school needs	0.579	
3	Prepare and implement flexible working arrangements for teaching and non-teaching personnel according to CSC guidelines	0.55	

Table 6 (Cont.)

No.	Item Statements	Factor Score	Dimension
8	Collaborate with internal and external partners to address the needs identified in the School Continuity Plan.	0.468	

Scree Plot of Adaptive Management Construct

The scree plot illustrates eigenvalues by factor number, showing variance explained by each factor. A sharp drop after the first factor suggests it dominates the construct, with the main "elbow" indicating one factor should be retained. However, since eigenvalues for up to three or four factors remain above 1, additional factors may also be considered based on theoretical justification.

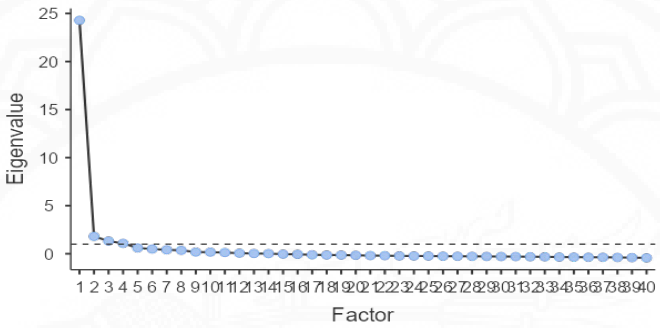

Figure 1 Scree plot of adaptive management construct.

Synthesis

The four adaptive management dimensions conceptualized prior to the exploratory factor analysis (EFA)—implementation of learning continuity plans, collaborative evaluation, data-driven planning, and operational coordination—were empirically validated through the analysis. The EFA extracted four factors that corresponded directly to these theoretical components. Dimension 1, *Actual Implementation of Learning Continuity Plans and Protocols*, aligned with maintaining uninterrupted learning during crises. Dimension 2, *Collaborative Evaluation and Continuous Learning*, reflected joint assessment and shared learning practices. Dimension 3, *Data-Driven Planning and Prioritization in School Crisis Response*, captured evidence-based decision-making and prioritization, while Dimension 4, *Operational Implementation and Coordination of School Continuity Plans*, emphasized organizing resources and procedures to sustain school operations. These results confirm that the instrument effectively measures the intended dimensions, providing both conceptual clarity and empirical support for understanding adaptive management among secondary school heads in crisis contexts.

Discussions

The findings highlight adaptive management strategies employed by school heads in Region XI, Philippines, in response to crises characterized primarily by natural disasters (e.g., typhoons, flooding, earthquakes), public health emergencies, and other localized disruptions that threaten learning continuity. These crises necessitate strategic, flexible, and context-sensitive leadership approaches. The four core dimensions—actual implementation of learning continuity plans and protocols, collaborative evaluation and continuous learning, data-driven planning and prioritization, and operational implementation and coordination of school continuity plans—reflect both the conceptual framework and the empirical EFA results. These dimensions correspond to the adaptive management

cycle of planning, doing, evaluating, learning, and adjusting, which guides strategic responses to uncertainty (Department of Primary Industries, Parks, Water and Environment, 2016 as cited in West, 2016). They also align with the adaptive cycle of planning, implementation, monitoring, and revision emphasized in crisis-responsive educational leadership frameworks, highlighting the importance of context-specific, iterative, and evidence-informed decision-making (Dayagbil et al., 2021; United Nations Educational, Scientific and Cultural Organization, 2020).

Dimension 1 illustrates how school heads operationalize health and safety protocols, organize flexible work arrangements, and allocate human and material resources to sustain learning, consistent with DepEd's Basic Education Learning Continuity Plan (BE-LCP) and Philippine-specific studies (Pagdilao & Paguyo, 2023; Abril & Callo, 2021). Dimension 2 underscores shared leadership, collaborative problem-solving, and continuous professional development through School Learning Action Cells (Gamboa, 2023), enabling rapid adaptation to localized crisis conditions, including pandemic-related school closures. Dimension 3 demonstrates data-driven prioritization using School Monitoring, Evaluation, and Adjustment (SMEA) processes, which guide evidence-based decision-making and resource allocation in the local context (Banaag & Salmon, 2025; Adanne, 2024). Finally, Dimension 4 reflects operational coordination of school functions, including reproduction of Self-Learning Modules, alignment with DepEd directives, and stakeholder engagement, emphasizing practical resilience during region-specific emergencies (Panopio, 2022; Martin, 2022). By situating these findings within the actual crisis landscape of Region XI, the study underscores the applicability of adaptive management principles in guiding school leaders through complex, recurring challenges while maintaining educational continuity.

The adaptive management practices outlined above reflect the principles of transformative and instructional leadership in times of crisis. The school heads demonstrated strategic agility, collaborative problem-solving, and data-informed decision-making to ensure educational continuity and school safety (Leithwood et al., 2020; Harris, 2020).

Moreover, in terms of theoretical implications, this study adopts the Adaptive Management Framework, a dynamic, iterative approach that integrates planning, action, reflection, and learning in response to uncertainty and disruption. Initially rooted in ecological and organizational management (Holling, 1978; Williams & Brown, 2014), adaptive management has found renewed relevance in educational leadership, particularly in managing crises such as pandemics, natural disasters, and sociopolitical disruptions.

From a theoretical standpoint, adaptive management aligns with the principles of complexity theory and systems thinking in educational leadership (Fullan, 2004; Senge, 1990). It recognizes that school environments are complex adaptive systems where rigid, top-down strategies often fail under stress. Instead, the cyclical phases of Plan, Do, Evaluate, and Learn encourage decentralized, context-sensitive, and participatory decision-making. This framework resonates with transformational leadership theory, as it promotes proactive visioning, stakeholder empowerment, and continuous improvement (Leithwood & Jantzi, 2006). In this sense, adaptive management is not merely reactive but strategic and transformative, cultivating resilience and innovation within school systems.

In practice, the framework equips school heads to implement evidence-based and collaborative actions during crises. Stakeholder participation plays a central role in this process. Studies show that involvement in School Improvement Planning (SIP) remains strong, with high levels of participation across assessment, planning, and implementation phases (Nicdao & Ancho, 2020). Schools also demonstrate resilience in the face of disruptions by sustaining collaboration, strategic planning, and transparent communication with their communities (Peregrino

et al., 2022). Re-examining the SIP and aligning it with the School Monitoring, Evaluation, and Adjustment (SMEA) process further illustrates a data-driven culture that supports responsiveness and continuous improvement.

The implementation of the "Do" phase highlights managerial agility in executing flexible work arrangements, enforcing health protocols, and utilizing digital platforms. These efforts demonstrate how adaptive management promotes distributed leadership and task delegation, which are critical under crisis conditions (Harris, 2020). Mobilizing partnerships and community resources also reflects the principle of leveraging external capacity to sustain school functions amid adversity.

The Evaluate phase—using SLACs, benchmarking, and feedback systems—promotes reflection, accountability, and data-driven improvement, while the Learn/Adjust phase converts these insights into refined practices and responsive policy shifts essential for school resilience. Research shows that SLACs effectively identify instructional gaps and support practice enhancement (Gamboa, 2023), serving as a cost-efficient, collaborative platform for strengthening teaching effectiveness (Culajara, 2023) and improving educational quality through monitoring and evaluation (Navarro et al., 2025). Together, these processes cultivate a culture of continuous learning that enables schools to adapt, address challenges systematically, and sustain long-term improvement.

At the policy level, this study contributes to debates on decentralized governance and crisis-responsive planning by highlighting the value of localized, adaptive approaches to school leadership. Philippine research supports this direction: Padawil et al. (2025) show that despite implementation challenges, decentralization and school-based management enhance local responsiveness, while Enad (2025) validates a systems-informed framework that helps leaders diagnose issues and implement strategic interventions. Studies on adaptive leadership further affirm its importance in crises, with Famero (2024) identifying key adaptive practices during COVID-19.

The Adaptive Management Framework provides a robust foundation for school heads to navigate complexity, lead resiliently, and foster collaborative school cultures. It integrates theoretical insights from complexity and transformational leadership, practical strategies for implementation, and policy considerations that enable systemic responsiveness. By embedding adaptive management into the fabric of school leadership, educational institutions can become more agile, inclusive, and sustainable in the face of ongoing and future crises.

Conclusions and Suggestions

This study identified four core dimensions of adaptive management among secondary school heads during crises—implementation of learning continuity plans, collaborative evaluation and learning, data-driven planning, and operational coordination—guided by the principles of Adaptive Management Theory. These constructs were derived in three stages. First, Adaptive Management Theory provided the conceptual foundation, emphasizing iterative planning, action, evaluation, and learning to navigate uncertainty. Second, interviews with school heads in Region XI contextualized these constructs, revealing practical strategies, stakeholder engagement practices, and local challenges. Finally, Exploratory Factor Analysis (EFA) empirically confirmed the structure, with the four dimensions collectively explaining 72.7% of the variance, validating the instrument and the applicability of Adaptive Management Theory in school crisis contexts. Together, these findings demonstrate that adaptive management integrates strategic, operational, and collaborative competencies essential for effective school leadership during crises.

Future research should refine and validate the framework through confirmatory and longitudinal studies. In practice, school leaders can strengthen adaptive capacity via training, crisis simulations, and structured feedback mechanisms. Policy actions should include integrating adaptive management indicators into leadership standards,

investing in school-level data systems, and supporting decentralized, crisis-responsive governance to ensure resilient and inclusive educational continuity.

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