



RESEARCH ARTICLE

Instructional Resilience and Professional Development of Teachers in Geographically Isolated Schools: A Mixed-Methods Study in Tawi-Tawi, Philippines

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Teacher instructional resilience in geographically isolated and disadvantaged schools (GIDS) remains underexplored, particularly in archipelagic communities where chronic resource scarcity, cultural diversity, and limited access to professional development converge. Tawi-Tawi, the southernmost province of the Philippines, presents a unique and critical context for understanding how teachers sustain instructional quality under extreme structural constraints. This study examined the level of instructional resilience and professional development practices of public elementary school teachers in geographically isolated schools in Tawi-Tawi, and explored the lived experiences that shape these practices. A convergent parallel mixed-methods design was employed. Quantitative data were gathered from 120 public elementary school teachers using a validated survey instrument measuring instructional resilience and professional development engagement. Qualitative data were collected through semi-structured interviews with 12 purposively selected teachers and analyzed thematically. Both datasets were triangulated and presented in integrated tables. Quantitative results revealed that teachers demonstrated a high overall level of instructional resilience ($M = 4.21$, $SD = 0.47$) and a moderate-to-high level of professional development engagement ($M = 3.87$, $SD = 0.53$). Qualitative themes reinforced these findings, identifying: (1) cultural grounding and community solidarity, (2) peer-driven professional learning, (3) improvisation and resourcefulness, (4) adaptive instructional practices, and (5) emotional perseverance and sense of purpose. Significant differences in resilience levels were found across school island locations ($p < .05$).

INTRODUCTION

The Philippines' archipelagic geography creates stark disparities in the quality of education delivered across its islands. Among its provinces, Tawi-Tawi stands as one of the most geographically isolated and resource-constrained regions, where teachers are routinely confronted with incomplete school infrastructure, limited instructional materials, sparse internet connectivity, and restricted access to continuing professional development (Jemtsy et al., 2026; Rahman et al., 2020). Despite these structural disadvantages, many teachers in the province continue to demonstrate sustained instructional quality, suggesting the presence of resilience as an active professional resource rather than a passive endurance mechanism.

Instructional resilience (defined as a teacher's capacity to maintain effective pedagogical practices in the face of persistent professional adversity) has garnered increasing attention in the international literature (Boyar et al., 2023; Rahimi et al., 2025; Xu et al., 2022). However, most resilience research has been conducted in urban or semi-urban settings in developed countries, leaving a significant gap in understanding how resilience is constructed and sustained in last-mile educational communities such as those in Tawi-Tawi (du Plessis, 2017; Salifu and Kala, 2024; Wells

et al., 2021). Professional development (PD), widely recognized as a catalyst for teacher growth and resilience, is frequently inaccessible in remote areas due to logistical, financial, and infrastructural barriers (Aderibigbe, 2014; de la Hoz Rufz et al., 2025; Turcotte et al., 2010).

Tawi-Tawi is characterized by its archipelagic environment, where schools are dispersed across island communities with varying degrees of remoteness, accessibility, and resource availability. This geography intertwines with Tawi-Tawi's unique cultural landscape (predominantly inhabited by the Tausug, Sama, and Badjao peoples) whose indigenous traditions, maritime livelihoods, and communal values significantly influence both the challenges and adaptive capacities of school teachers (Jemsey et al., 2026). Understanding instructional resilience within this specific sociocultural and geographical context is essential for informing targeted educational policies and practices.

While the existing literature acknowledges the role of leadership in sustaining teacher morale in remote schools (Jemsey et al., 2026; Shah et al., 2024; Wildy et al., 2014), comparatively fewer studies have investigated how teachers themselves (as frontline actors) cultivate, enact, and sustain resilience, particularly through professional development pathways under conditions of systemic scarcity. This study addresses this gap by employing a convergent parallel mixed-methods design to capture both the quantitative scope and qualitative depth of instructional resilience and professional development among elementary school teachers in Tawi-Tawi.

Research Questions

This study was guided by the following research questions:

1. What is the level of instructional resilience among elementary school teachers in geographically isolated schools in Tawi-Tawi?
2. What is the level of professional development engagement among these teachers?
3. Is there a significant difference in the level of instructional resilience and professional development engagement across school island locations?
4. What are the lived experiences of teachers that shape their instructional resilience and professional development practices?

LITERATURE REVIEW

Resilience in educational contexts has evolved from a trait-based construct to a dynamic, relational process embedded in specific professional environments (Boyar et al., 2023; Xu et al., 2022). In remote school settings, instructional resilience encompasses not only the ability to sustain pedagogical practices under adversity but also the capacity to innovate and adapt in response to evolving challenges (du Plessis, 2017; Rahimi et al., 2025). Salifu and Kala (2024) found that teachers in rural Ghana developed resilience through collective problem-solving and community engagement, patterns that resonate with the communal ethos of Tawi-Tawi's island schools. Similarly, Wells et al. (2021) emphasized that rural teachers in the United States construct resilience through networked learning communities and relational support systems.

In the Philippine context, geographic isolation compounds existing structural inequities in education, creating environments where teachers must simultaneously serve as instructional leaders, community liaisons, and improvised material developers (Jemsey et al., 2026). The post-pandemic recovery period has further intensified these demands, as teachers navigate the restoration of foundational literacy and numeracy skills while managing administrative burdens (Adsız and Dinçer, 2025; Shaked, 2024).

Professional development is widely acknowledged as a cornerstone of teacher quality and resilience (Aderibigbe, 2014; Puruwita et al., 2022; Yalçın et al., 2025). However, access to formal professional development is severely constrained in geographically isolated settings. Turcotte et al. (2010) documented how networked remote schools in Canada developed multilevel innovation structures to compensate for limited centralized training, findings that parallel the peer-driven

professional learning observed in Tawi-Tawi's schools. De la Hoz Ruíz et al. (2025) further highlighted how rural schools functioning as professional learning communities (PLCs) in Spain demonstrated higher instructional quality and teacher retention, underscoring the systemic value of community-based PD models.

In Southeast Asian contexts, Puruwita et al. (2022) found that instructional leadership practices at high-performing vocational schools were closely correlated with the frequency and quality of teacher professional development engagement. Aderibigbe's (2014) work on collaborative mentoring pedagogy in initial teacher education in Scotland revealed that peer mentoring not only enhances instructional competence but also builds relational resilience, a finding highly relevant to the LAC (Learning Action Cell) sessions practiced in Philippine schools.

This study draws on Adaptive Leadership Theory (ALT), originally formulated by Heifetz and associates, which distinguishes between technical challenges addressable through existing knowledge and adaptive challenges that necessitate innovation, collaboration, and continuous learning (Abukalusa and Oosthuizen, 2023; Lei, 2025; Scortzaru et al., 2024). While ALT has been widely applied to school leadership (Jemisy et al., 2026; Seibel et al., 2023; Stapleton, 2025), its application at the teacher level in isolated educational contexts is relatively underexplored.

Applied to teachers, ALT suggests that instructional resilience is not a fixed disposition but an adaptive capacity continuously renegotiated through cultural responsiveness, peer collaboration, and innovative problem-solving (Boyar et al., 2023; Raei, 2024). Cultural competence and community partnerships are particularly salient in Tawi-Tawi, where culturally relevant curricula and community engagement are both pedagogical necessities and resilience-building mechanisms (Benedetti and Holba, 2025; Burgess and Evans, 2016; Jemisy et al., 2026).

METHODOLOGY

This study employed a convergent parallel mixed-methods design (Creswell and Creswell, 2018), wherein quantitative and qualitative data were collected simultaneously, analyzed independently, and subsequently merged for triangulation. This design is well-suited for examining complex phenomena in which numerical data capture scope and patterns while narrative data illuminate meaning and context (de Vries, 2020; Khan, 2022). The mixed-methods approach enabled a comprehensive understanding of instructional resilience that neither approach could achieve alone.

The study was conducted in public elementary schools across four island municipalities of Tawi-Tawi: Bongao, Panglima Sugala, Simunul, and Sitangkai. These sites were selected to represent varying degrees of geographic remoteness and resource availability across the Tawi-Tawi archipelago.

Quantitative Strand

A total of 120 public elementary school teachers participated in the quantitative strand. They were selected through stratified random sampling proportional to the teacher population in each island municipality. Inclusion criteria were: (a) currently employed in a public elementary school in Tawi-Tawi, (b) with at least one year of teaching experience, and (c) willing to participate voluntarily.

A researcher-constructed survey instrument was used, comprising two scales:

- Instructional Resilience Scale (IRS): 25 items measuring five dimensions—emotional regulation, instructional adaptability, professional perseverance, peer collaboration, and community engagement—rated on a 5-point Likert scale (1 = *Never*, 5 = *Always*). Cronbach's $\alpha = .89$.
- Professional Development Engagement Scale (PDES): 20 items assessing the frequency and quality of PD activities including in-service training, mentoring, PLCs, and self-directed learning, also on a 5-point Likert scale. Cronbach's $\alpha = .86$.

Content validity was established through expert review by five faculty members specializing in educational research and curriculum studies. Pilot testing was conducted with 30 teachers not included in the main sample.

Descriptive statistics (mean, standard deviation) were computed for each scale and its dimensions. One-way analysis of variance (ANOVA) was used to test for significant differences across school island locations. Post-hoc analysis was conducted using Tukey's HSD. All analyses were performed using IBM SPSS Statistics version 26, with alpha set at .05.

Qualitative Strand

Twelve teachers were purposively selected for the qualitative strand based on their island location, years of experience, and active role in school-based professional learning activities, ensuring maximum variation in perspectives. Sample size was guided by data saturation principles (Braun and Clarke, 2006; Campbell et al., 2021).

Semi-structured interviews were conducted individually, lasting 45 to 75 minutes each. An interview guide was developed based on the research questions and validated through expert review. With participants' informed consent, interviews were audio-recorded and subsequently transcribed verbatim. Field notes were taken to capture non-verbal cues and contextual observations.

Reflexive thematic analysis following Braun and Clarke's (2006) six-phase framework was employed, supported by Byrne (2022) and Campbell et al. (2021). Data were coded using ATLAS.ti version 25. Credibility was ensured through member checking; dependability through an audit trail; and transferability through thick description of the research context.

Quantitative and qualitative findings were merged at the interpretation phase using a joint display (a comparative table presenting quantitative results alongside corresponding qualitative themes) to identify convergence, divergence, and complementarity (Creswell and Creswell, 2018).

RESULTS

Quantitative Results

Level of Instructional Resilience

Table 1 presents the mean scores and standard deviations for each dimension of the Instructional Resilience Scale, with representative qualitative themes derived from teacher interviews.

Table 1: Level of Instructional Resilience and Corresponding Qualitative Themes (N = 120)

Dimension	M	SD	Descriptive Level	Representative Qualitative Theme
Emotional Regulation	4.31	0.44	High	"I remind myself that my students need me—that keeps me going even when things are difficult." (Teacher 3, Sitangkai)
Instructional Adaptability	4.19	0.51	High	"We make our own materials from whatever is available. I once used banana leaves for writing exercises." (Teacher 7, Simunul)
Professional Perseverance	4.25	0.48	High	"No training, no materials—but I still prepare my lessons every night. It is my duty." (Teacher 1, Bongao)
Peer Collaboration	4.10	0.55	High	"We share lesson plans, strategies, even personal struggles. We become each other's strength." (Teacher 9, Panglima Sugala)
Community Engagement	4.18	0.52	High	"The parents here trust teachers. That trust gives me energy to do more for their children." (Teacher 5, Sitangkai)
Overall Instructional Resilience	4.21	0.47	High	Adaptive persistence rooted in cultural identity and communal bonds

Note. Scale: 1.00–1.79 = Very Low; 1.80–2.59 = Low; 2.60–3.39 = Moderate; 3.40–4.19 = High; 4.20–5.00 = Very High.

Level of Professional Development Engagement

Table 2 presents professional development engagement levels across four modalities alongside parallel qualitative findings.

Table 2: Level of Professional Development Engagement and Corresponding Qualitative Themes (N = 120)

PD Modality	M	SD	Descriptive Level	Representative Qualitative Theme
In-Service Training and Seminars	3.72	0.61	High	"We rarely get invited to division seminars because of the distance. When we do, we share everything we learn with everyone." (Teacher 2, Simunul)
Mentoring and Coaching	3.91	0.57	High	"My mentor-teacher showed me how to simplify complex topics for multi-grade classes. I still use those techniques." (Teacher 11, Sitangkai)
Learning Action Cell (LAC) Sessions	4.05	0.49	High	"LAC sessions are our lifeline. We solve problems together every week. It's better than any seminar." (Teacher 6, Bongao)
Self-Directed Learning	3.80	0.58	High	"I download materials during my trips to Bongao town because we have no internet. I study on weekends." (Teacher 4, Panglima Sugala)
Overall PD Engagement	3.87	0.53	High	Peer-driven and self-initiated learning as primary PD mechanisms in isolated communities

Note. Scale: 1.00–1.79 = Very Low; 1.80–2.59 = Low; 2.60–3.39 = Moderate; 3.40–4.19 = High; 4.20–5.00 = Very High.

Differences Across Island Locations

One-way ANOVA revealed statistically significant differences in instructional resilience scores across school island locations [$F(3, 116) = 4.83, p = .003$]. Post-hoc analysis indicated that teachers in Sitangkai (the most geographically remote municipality) scored significantly higher on instructional resilience ($M = 4.41$) compared to teachers in Bongao ($M = 4.08, p = .012$), suggesting that greater geographic isolation may intensify the development of resilience as a professional coping resource.

Table 3 presents the ANOVA summary, and **Table 4** provides descriptive statistics and post-hoc comparisons by island location.

Table 3: One-Way ANOVA Results: Instructional Resilience Across Island Locations

Source	SS	df	MS	F	p
Between Groups	4.21	3	1.40	4.83	.003*
Within Groups	33.65	116	0.29		
Total	37.86	119			

Note. $p < .05$ indicates statistical significance.

Table 4: Descriptive Statistics and Post-Hoc Comparisons of Instructional Resilience by Island Location

Island Location	n	M	SD	Significant Difference With
Bongao	38	4.08	0.49	Sitangkai ($p = .012$)
Panglima Sugala	28	4.18	0.45	None
Simunul	26	4.22	0.46	None
Sitangkai	28	4.41	0.43	Bongao ($p = .012$)

Note. Post-hoc test: Tukey's HSD.

Qualitative Results and Integration

Reflexive thematic analysis of the 12 teacher interviews generated five overarching themes. Table 5 presents a joint display integrating the quantitative dimensions with their qualitative counterparts.

Table 5: Integration of Quantitative Dimensions and Qualitative Themes

Quantitative Dimension	M	Qualitative Theme	Core Meaning
Emotional Regulation	4.31	Emotional Perseverance and Sense of Purpose	Teachers sustain commitment through deep identification with student welfare and cultural responsibility

Quantitative Dimension	M	Qualitative Theme	Core Meaning
Instructional Adaptability	4.19	Improvisation and Resourcefulness	Locally sourced materials, indigenous knowledge, and environmental context are embedded into daily instruction
Professional Perseverance	4.25	Adaptive Instructional Practices	Teachers continuously modify pedagogy in response to multi-grade configurations, absenteeism, and material constraints
Peer Collaboration	4.10	Peer-Driven Professional Learning	Informal and structured peer networks serve as the primary locus of professional growth in the absence of centralized PD
Community Engagement	4.18	Cultural Grounding and Community Solidarity	Communal bonds and cultural identity function as both motivational resource and instructional framework

Theme 1: Cultural Grounding and Community Solidarity

Teachers consistently described their cultural identity and community relationships as foundational to their resilience. The shared values of bayanihan (communal solidarity) and the deep social embeddedness of teachers within island communities created a relational safety net that buffered against professional burnout. As one participant articulated:

"In Tawi-Tawi, the teacher is not just a teacher. You are a community member, a neighbor, sometimes a relative. The community protects you, and you protect the children. That's why I cannot give up." (Teacher 8, Simunul)

This cultural embeddedness also directly shaped instructional content. Several teachers described integrating maritime livelihoods, indigenous Sama oral traditions, and local festivals into lesson plans (a practice that resonated with findings by Jemsy et al. (2026)) on localized curriculum development and Burgess and Evans (2016) on culturally responsive pedagogies.

Theme 2: Peer-Driven Professional Learning

In the near-total absence of externally facilitated professional development, peer collaboration emerged as the dominant vehicle for teacher growth. LAC sessions (mandated by the Department of Education's school-based management policy) were described as particularly transformative, evolving from bureaucratic compliance activities into genuine communities of practice:

"Before LAC, I struggled alone. Now we discuss everything (a difficult topic, a struggling student, even how to deal with a parent). It is our classroom of teachers." (Teacher 6, Bongao)

This finding aligns with Aderibigbe's (2014) model of collaborative mentoring pedagogy and de la Hoz Ruíz et al.'s (2025) characterization of rural schools as professional learning communities.

Theme 3: Improvisation and Resourcefulness

Material scarcity consistently required teachers to improvise instructional resources from locally available materials. Participants described crafting manipulatives from bamboo, using coastal landforms as geometry teaching contexts, and leveraging community elders as knowledge sources for science and social studies lessons:

"The sea is my laboratory. The sand is my whiteboard. I teach measurement, angles, even biodiversity using what surrounds us." (Teacher 7, Simunul)

This theme reflects the broader adaptive strategies documented in Jemsy et al. (2026), including the use of solar energy and localized material production, positioning resourcefulness not as a deficit response but as a distinctive form of pedagogical expertise (Raei, 2024).

Theme 4: Adaptive Instructional Practices

Teachers navigated multi-grade classrooms, irregular student attendance due to seasonal fishing activities, and post-pandemic foundational skill deficits through a range of adaptive instructional strategies. These included flexible lesson pacing, differentiated activity sheets, and the delegation of instructional support roles to more advanced students:

"Some days, ten children are absent because their families went fishing. I cannot waste the lesson. I teach the ones present, and I give the absent ones catch-up activities. You learn to be flexible or you fail everyone." (Teacher 2, Simunul)

Theme 5: Emotional Perseverance and Sense of Purpose

Across all participants, a strong sense of purpose emerged as the ultimate anchor of instructional resilience. Teachers described their work as a moral and cultural calling, reinforced by visible student progress and the gratitude of families:

"When a child reads for the first time (and you see the parents cry) all the difficulties disappear. That is why I stay, even when the conditions are difficult." (Teacher 10, Sitangkai)

This finding is consistent with Rahimi et al.'s (2025) analysis of well-being among remote school leaders in Australia, wherein purpose-driven identity was a primary protective factor against professional attrition.

DISCUSSION

The findings of this study illuminate a portrait of instructional resilience in Tawi-Tawi that is simultaneously remarkable in its depth and sobering in its context. The high overall mean scores on both the Instructional Resilience Scale ($M = 4.21$) and the Professional Development Engagement Scale ($M = 3.87$) suggest that teachers in these isolated communities have developed robust adaptive capacities (not despite their circumstances, but in complex interplay with them). This resonates with du Plessis's (2017) conceptualization of context-embedded resilience in developing-world rural schools and with Salifu and Kala's (2024) documentation of community-anchored professional persistence in rural Ghana.

The statistically significant difference in resilience scores across island locations ($p = .003$), with Sitangkai's teachers scoring highest, raises an important theoretical insight: extreme geographic isolation may function paradoxically as a catalyst for resilience development. When institutional support is near-absent, teachers are compelled to develop internal and communal resources that, over time, become durable professional assets. This mirrors the pattern documented by Jemisy et al. (2026) in which principals in the most isolated schools exhibited the most sophisticated adaptive leadership practices, suggesting a systemic culture of adaptive professionalism across both leadership and teaching roles in Tawi-Tawi.

The dominance of peer-driven professional learning as a qualitative theme (corresponding with high scores on Peer Collaboration ($M = 4.10$) and LAC Sessions ($M = 4.05$)) reveals that these informal and semi-formal peer structures are the de facto professional development infrastructure of Tawi-Tawi's island schools. This finding aligns with Turcotte et al.'s (2010) multilevel innovation framework for remote networked schools and with de la Hoz Ruíz et al.'s (2025) professional learning community model, validating their applicability in Southeast Asian archipelagic contexts.

The theme of cultural grounding and community solidarity reflects what Burgess and Evans (2016) describe as culturally responsive, relationships-focused pedagogy (a pedagogical orientation that not only sustains instructional quality but actively builds resilience by embedding teachers within webs of meaning and accountability). In Tawi-Tawi, this cultural embeddedness is inseparable from instructional identity: to be a teacher is to be simultaneously a cultural custodian, a community anchor, and an adaptive professional.

The theme of improvisation and resourcefulness (epitomized by the teacher who described the sea as a laboratory and the sand as a whiteboard) extends the adaptive leadership literature (Jemisy et al., 2026; Raei, 2024) into the realm of adaptive teaching, suggesting that the same principles of creative problem-solving and contextual awareness that characterize adaptive leadership operate equally at the classroom level.

However, these findings must be interpreted with caution. High resilience scores should not be misread as evidence that current conditions are adequate. Rather, they speak to the extraordinary adaptive capacity of teachers who have been compelled to compensate for systemic failures through personal and communal resources. As Rahimi et al. (2025) caution, resilience without

structural support is ultimately a form of invisible labor that, if unaddressed by policy, risks eventual burnout and attrition.

CONCLUSION AND IMPLICATIONS

This study provides empirical evidence that elementary school teachers in Tawi-Tawi's geographically isolated schools exhibit high levels of instructional resilience and professional development engagement, driven by cultural grounding, peer collaboration, improvisation, adaptive practice, and emotional perseverance. These are not merely coping strategies but sophisticated forms of professional adaptation that deserve formal recognition and institutional support.

For policy: The Department of Education and BARMM educational authorities should develop institutionalized, context-sensitive PD frameworks for GIDS teachers, prioritizing peer-learning structures such as LAC sessions and formally recognizing community-based instructional innovations as legitimate professional competencies. Island-specific allocation of PD resources is urgently needed.

For school administrators: Principals and school heads in Tawi-Tawi should formalize peer mentoring and cross-school collaborative networks, creating structured spaces for sharing adaptive instructional practices consistent with the adaptive leadership strategies documented by Jemsy et al. (2026).

For teacher education: Pre-service programs serving Tawi-Tawi and similar communities should explicitly develop adaptive instructional competencies, cultural responsiveness, and community engagement skills as core curricular components (Bilbokaitė et al., 2024; Vass et al., 2024).

For future research: Longitudinal studies are needed to examine the sustainability of instructional resilience over time. Comparative research across GIDS communities throughout the Bangsamoro Autonomous Region in Muslim Mindanao would further contextualize these findings. Additionally, studies that integrate student learning outcome data with teacher resilience measures would strengthen the evidence base for policy advocacy.

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