Strategic Adaptation of the Scouting Movement in the Digital Era: Experience in a Developing Country with Indonesia as a Case Study

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Abstract

Rapid technological advances, particularly the integration of Artificial Intelligence (AI), have transformed educational and social environments worldwide. For the Scouting movement, digital tools offer new operational conveniences through GPS navigation, collaborative software, and interactive learning platforms. However, they also bring significant challenges, including youth social isolation, device dependency, and the spread of AI-generated misinformation. This paper examines these dynamics within Gerakan Pramuka, the National Scout Organization (NSO) with the largest membership in the world. Drawing on firsthand practitioner observations, this study highlights the unique multi-layered burden faced by NSOs in developing nations: counteracting the social risks of digital saturation while navigating persistent regional gaps in internet connectivity, data quality, and systemic electricity grid instability. To resolve this tension, the paper proposes a "hybrid resilience" model. Under this framework, digital tools serve as optional enhancements for administration and creative engagement behind the scenes, while the core pedagogical experience remains firmly rooted in offline, nature-based, and face-to-face outdoor learning.

Keywords: *Gerakan Pramuka, non-formal education, digital divide, energy security, grid instability, hybrid resilience, Artificial Intelligence (AI), digital literacy*.

1. Introduction

Rapid technological change, particularly the rise of artificial intelligence and constant mobile connectivity, has fundamentally altered how young people learn, communicate, and interact. Like many non-formal educational institutions, the global Scouting movement faces an important inflection point. On one hand, modern technology provides practical ways to support youth activities. Traditional map-and-compass navigation can be paired with digital tools like Google Maps or Waze, while training sessions use interactive platforms such as Kahoot, Slido, Google Forms, and Canva.

On the other hand, heavy screen use creates noticeable social friction. Device reliance often leads to individual isolation, weakens face-to-face social bonds, and alters family communication patterns. Today, family members sitting in the same home often communicate through messaging apps, and dinner tables are frequently marked by silent screen scrolling rather than active conversation. These patterns carry over into youth activities; even during Scout assemblies, participants are frequently distracted by personal smartphones. At the same time, AI-driven tools have made it easier to produce and distribute online hoaxes and hate speech, making it harder for young people to evaluate online information critically (Ferrara, 2024).

In developing countries like Indonesia, these behavioral changes are further complicated by deeper structural inequalities. As home to Gerakan Pramuka—the largest NSO in the world—Indonesia presents a stark contrast between rapid urban digitization and widespread rural infrastructure deficits. Internet speed and coverage remain unreliable outside major metropolitan

centers like Greater Jakarta. Furthermore, this digital gap is severely exacerbated by widespread energy insecurity and recurring power shortages across the archipelago's power networks. When local grids fail, they trigger a cascading collapse in telecommunications infrastructure, rapidly draining backup generator networks and cutting off cellular signals entirely. Consequently, NSOs face a vital and practical question: How can the Scouting movement successfully adapt to a digital environment when its operational context is split by a severe digital divide, geographical fragmentation, and unpredictable power infrastructure grid failures?

This paper argues that NSOs should avoid binary choices that either blindly accept or completely reject digital technology. Instead, organizations should adopt a flexible, practical framework where digital tools do not replace core educational methods. Instead, technology should serve strictly as an optional supplement for administrative efficiency and creative projects, while frontline Scouting activities stay anchored in a fully offline, analog format. By establishing clear priorities early on, youth organizations can take advantage of digital benefits without creating operational vulnerabilities or deepening digital inequities.

2. Literature Review

2.1 The Digital Transition in Youth Educational Movements

Modern educational research increasingly highlights the tension between digital convenience and experiential learning. While digital platforms can boost short-term interest through gamification, excessive screen time is consistently linked to lower emotional awareness and diminished social skills among adolescents. In contrast, Scouting education—established by Robert Baden-Powell—relies on small group dynamics (the patrol system), direct personal interactions, peer support, and outdoor challenges. Sociological studies show that replacing physical group activities with

digital substitutes weakens the development of community responsibility and empathy. While technology can streamline organizational tasks, it cannot replace physical, experience-based learning. Without clear limits on screen use, unstructured digital integration risks diluting the core character-building goals of the movement.

2.2 Artificial Intelligence, Media Literacy, and Truth Decay

The rapid rise of AI-generated content has accelerated what researchers call "truth decay" (Kavanagh & Rich, 2018). Low barriers to creating realistic deepfakes and automated misinformation lead to heavily polarized online spaces. For youth organizations, this shift requires moving beyond basic computer skills toward practical media defense and critical thinking (Livingstone, 2024). Social media channels heavily used by teenagers often amplify sensationalized or false information. Because young users are particularly vulnerable to online echo chambers (Twenge, 2017), non-formal educational movements like Scouting must actively foster critical reflection. Teaching media defense should not be a burdensome administrative task, but a practical skill that helps youth recognize bias and evaluate online media safely.

2.3 The Digital Divide in Developing Countries

Technology adoption in developing economies is rarely uniform. Infrastructure delays in peripheral and rural regions create inconsistent connectivity. Educational programs designed around mandatory high-speed internet access inevitably exclude rural and lower-income participants. Research on educational technology in Southeast Asia emphasizes the need for high offline resilience—the capacity to deliver full educational value without an active internet connection. This structural gap points to the key limitation of digital-first models in developing nations. To maintain equal access, advancement requirements must remain grounded in offline

activities, ensuring that digital applications remain helpful additions rather than strict prerequisites.

2.4 Energy Security, Grid Instability, and Digital Vulnerability

The success of digital education paradigms assumes not only stable internet connectivity but also an uninterrupted supply of electricity. In developing economies, systemic vulnerabilities in the energy sector create a secondary barrier to digital integration. Indonesia's geographic fragmentation as an archipelago poses massive logistical and structural hurdles for state electricity networks like PT PLN, resulting in uneven grid reliability across different regions. While urban centers on the main island of Java benefit from relatively stable power distribution, rural areas, peripheral islands, and industrial hubs remain highly susceptible to frequent rotating blackouts, voltage drops, and prolonged outages caused by infrastructure deficits or extreme weather.

Crucially, this energy instability introduces a compounding vulnerability to digital-first educational frameworks. When localized or regional power grids fail, the failure cascades rapidly into the telecommunications sector. Mobile network towers rely on localized backup batteries or generators that quickly deplete during prolonged blackouts, severing cellular signals even if personal electronic devices remain fully charged. Therefore, educational movements cannot address digital adaptation solely through the lens of device distribution or software access; they must account for the baseline fragility of the physical power systems that sustain these digital ecosystems.

3. Methodology

This study uses a qualitative, practitioner-researcher approach based on operational observations and field experience. This method is well-suited for examining large youth organizations, as it draws on direct internal access to observe group dynamics and field implementations that external observers might overlook. The primary goal is to analyze how broader technological trends and regional infrastructure gaps affect day-to-day Scouting activities within Gerakan Pramuka.

3.1 Research Context and Participant Field Observations

Observations were gathered across multiple organizational levels within Gerakan Pramuka to capture the impact of the country's digital divide:

- Urban Centers: Branch Councils (Kwartir Cabang) in metropolitan Java—specifically South Tangerang and the Greater Jakarta area (Jabodetabek)—characterized by high-speed broadband, 5G mobile coverage, and widespread smartphone ownership among youth.
- Rural and Outer Regions: Branch and District Councils (Kwartir Cabang/Ranting) in the Outer Islands and varied regional terrains (including East Nusa Tenggara and Sumatra), where electricity can be intermittent, 3G or 4G coverage is spotty, mobile data costs are relatively high, and devices are often shared within families.

Field observations covered three age brackets: Pramuka Penggalang (ages 11–15), Pramuka Penegak (ages 16–20), and Pramuka Pandega (ages 21–25), alongside adult leaders (Pembina Pramuka), providing an intergenerational view of technology adoption.

3.2 Data Collection Methods

Data were collected over several years using four primary qualitative methods:

- 1. Participant Field Observation: Direct participation in weekly troop meetings, local gatherings, and regional camps (jamborees and moots) centered in Greater Jakarta (Tangerang Selatan) and supplemented by field visits to outer provinces. Notes recorded youth behavior, comparing engagement during hands-on tasks with screen-heavy periods. Youth engagement was tracked across three specific markers: direct verbal communication within the patrol, physical task performance (such as pioneering and knot-tying speed), and the frequency of personal device checks per hour.
- 2. Operational Audits of Digital Tools: Evaluation of digital administrative apps and learning platforms (e.g., Kahoot, Canva, Google Forms, and the national AyoPramuka Kwarnas mobile app) across different branches. Technical disruptions were logged when network latency, packet loss, or service drops prevented participants from completing cloud-based tasks within a standard 15-minute window.
- 3. Observation of Family Communication Dynamics: Documentation of parent-child interactions during Scout camps, school-based troop meetings, and public gatherings to observe broader trends in face-to-face communication.
- 4. Case Study Analysis: Review of field logs, regional incident reports, and local documentation from rural digital outreach programs in Eastern Indonesia to evaluate how units adapted when network access failed.

3.3 Data Analysis and Bias Mitigation

Qualitative records were categorized into three primary analytical themes:

- **Theme 1**: Technical Friction and Social Disruption: Events where personal devices interrupted team focus, patrol unity, or direct social interaction.
- **Theme 2**: Infrastructure Bottlenecks: Technical disruptions where weak internet access or localized power grid failures prevented the use of digital lesson plans.
- **Theme 3**: Offline Pedagogical Resilience: Traditional, paper-and-field Scouting practices that maintained strong youth engagement and activity continuity without internet access.

To manage potential insider bias, field notes were cross-referenced against practical technical indicators, including local network latency checks and battery usage logs. Observations of family interaction patterns also provided an external baseline to determine whether screen reliance during Scout activities mirrored general social habits or was unique to the Scouting environment.

4. Discussion and Analysis

4.1 Digital Distraction and Infrastructure Disparities

Gerakan Pramuka operates between two competing forces: the push for digital integration and the commitment to outdoor, cooperative learning. Unregulated screen use often distracts youth from their immediate physical surroundings and reduces direct communication among peers. At the same time, national internet infrastructure remains unevenly distributed. According to the Speedtest Global Index (July 2026), Indonesia ranks 72nd globally for mobile internet speed and 113th for fixed broadband, with a median fixed download speed of 45.91 Mbps. Survey data from the Association of Internet Service Providers in Indonesia (APJII) shows that while national internet penetration reached 81.72% (over 235 million people), infrastructure remains

concentrated on Java (85.95% penetration). Other regions show lower connectivity rates: Sumatra at 78.24%, Kalimantan at 80.40%, and Maluku and Papua trailing at 69.74%. A clear urban-rural divide also persists, with urban internet penetration at 84.75% compared to 78.18% in rural areas. Relying on app-based curricula across these varied settings creates uneven access and risks leaving under-connected units behind. This vulnerability is further magnified when regional power grids fail, rendering even fully charged mobile devices useless once local network towers lose backup power.

The infrastructure disparities within Gerakan Pramuka's operational environment are underscored by systemic vulnerabilities in Indonesia's power grids. High-profile incidents, such as the massive 2026 transmission failure on the 275 kV link in Sumatra, demonstrate that even highly developed regional networks are vulnerable to sudden, cascading blackouts that paralyze local communication and economic activity for days. Similarly, periodic energy disruptions in industrial hubs and parts of Java highlight the precarious nature of relying on cloud-reliant digital curricula.

When an NSO mandates application-based training or digital checkpoint systems, it builds an operational dependency on an energy infrastructure that cannot guarantee 100% uptime. During an unexpected power outage, digital lesson plans become completely obsolete. This reality makes a compelling argument for preserving traditional, low-tech, and analog competencies as the irreducible baseline of the Scouting movement. Offline methods are not merely legacy practices; they are active defense mechanisms against inevitable energy security failures.

4.2 Preserving Core Offline Skills

Persistent connectivity gaps underline the ongoing importance of practical, offline Scouting skills. A Scout who relies entirely on smartphone navigation can become stranded when battery power depletes or network signals drop. Mastering traditional tools—such as the magnetic compass, topographic map reading, physical pioneering, and knot-tying—builds self-reliance and practical problem-solving capacities that digital tools cannot replicate.

4.3 Practical Evaluation of Technology Adoption

Adopting digital tools involves trade-offs between short-term engagement and long-term reliability. Interactive digital maps and online platforms can make lessons dynamic, but their dependence on steady power grids and mobile networks makes them vulnerable to sudden interruptions. Furthermore, introducing digital modules can impose financial burdens on families through mobile data costs. If an NSO makes online platforms mandatory, it risks widening the gap between urban and rural participants.

Table 1: Practical Comparison of Digital Adoption in Scouting

Functional Area	Digital Opportunities	Practical Challenges & Friction
Navigation & Mapping	Real-time GPS tracking and interactive digital mapping tools.	Loss of signal in remote terrain; reliance on battery power.
Knowledge & Assessment	Interactive quiz platforms that increase initial participation.	Device battery depletion and power outages interrupt activities.
Logistics & Commerce	Digital payment tools that simplify administrative transactions.	Mobile network congestion at large camps causes payment failures.
Civic Engagement	Media literacy modules that address online misinformation.	Screen distraction reduces face-to-face team communication.

4.4 Empirical Case Studies

Case 1: Infrastructure Interruption in Maurole District (Ende Regency)

From July through early September 2026, a hardware failure at a cellular tower in Otogedu Village cut off internet connectivity for youth across Maurole District, East Nusa Tenggara. Scouts could no longer use online search engines or mobile mapping apps during scheduled activities.

"*When the network went down, our digital checkpoint coordinates became useless. The youth initially experienced disconnection anxiety, but the structure of the patrol system forced them to collaborate manually and actively look for the answer in the library or ask local people in person for guidance*."

— Local Scout Leader Field Observation

Outcomes: Rather than pausing activities, units switched to printed maps and physical reference books. Over six weeks, field assessments for Pramuka Penggalang (ages 11–15) showed a 40% reduction in orientation errors during land navigation exercises. Without screens, Scouts relied on direct collaboration and sought local community guidance to complete their routes.

Case 2: Regional Power Grid Disruptions (Sumatra and Greater Jakarta)

Between May 22 and May 24, 2026, a transmission failure on the 275 kV link between Muara Bungo and Sungai Rumbai caused a major blackout across Sumatra, disabling local mobile networks. This outage occurred over a weekend during scheduled Scout activities. Similar power interruptions have occurred periodically in other regions, including parts of Java. Smartphone batteries drained quickly, leaving online learning platforms unusable.

"*We couldn't do the digital challenge because our phones died. At first, it felt frustrating, but through the wide games in the outdoor area, it made us interact and laugh much more than we usually do when staring at screens*."

— Youth Participant Reflection

Outcomes: This event highlighted the vulnerability of digitally dependent lesson plans. Transitioning back to traditional outdoor games restored activity focus and demonstrated why offline backups must remain a standard part of activity planning.

Case 3: Mobile Network Congestion at the 12th National Scout Jamboree (Cibubur)

During the 12th National Scout Jamboree at Cibubur (August 13–20, 2026), nearly 20,000 active participants gathered in one location, overwhelming local cellular towers. Mobile internet access was largely unavailable for the first three days.

"*Participants expecting to pay for supplies in the Pasar Jambo via mobile banking apps were stranded. We had to immediately mandate a cash-only baseline and switch the jamboree information from digital information to physical messages by the Scout Leaders. This also forced our youth to engage in direct, face-to-face negotiations and polite verbal transactions with local public vendors and merchants*."

— Event Logistics Coordinator

Outcomes: High participant density created a temporary digital dead zone in an urban setting. Reverting to cash transactions and physical notice boards kept operations moving while encouraging face-to-face communication between youth participants and local vendors.

Case 4: Digital Literacy Outreach in Komodo District (West Manggarai)

In West Manggarai, East Nusa Tenggara, the District Scout Headquarters (Kwarran) partnered with the local Communication and Informatics Agency (Dinkominfo) to deliver a digital literacy program entitled "Lonto Cama Literasi Digital, Pramuka Cerdas Pramuka Mantap" at SMKN 1 Boleng. The effort aimed to teach online safety, media evaluation, and digital skills to rural

youth. However, organizers encountered frequent signal drops, localized coverage gaps, and unexpected power cuts.

Outcomes: Instead of canceling the sessions, organizers shifted to face-to-face workshops and group discussions (*Lonto Cama* in the local language means sit together) while technical teams worked to stabilize local connections. The experience proved that even digital-focused educational programs require a flexible, offline-ready presentation format to succeed in rural settings.

5. Strategic Recommendations: The Hybrid Resilience Framework

5.1 Establish Clear Device Protocols During Outdoor Activities

- Operational Rule: NSOs should establish clear rules for personal device use during camps, patrol meetings, and field exercises. Smartphones can be stored securely by adult leaders upon arrival.
- Designated Access: Device access should be limited to specific times for logistical coordination, quick family check-ins, or tasks that explicitly require digital tools.
- Educational Focus: Reducing constant screen notifications allows youth to focus on field activities, builds direct communication skills, and supports patrol unity.

5.2 Ensure Advancement Tracks Remain Fully Offline

- Operational Rule: Core rank advancement requirements, proficiency badges, and key milestones—such as the Syarat Kecakapan Umum (SKU) in Indonesia—must be designed for complete offline completion.

• Supporting Equity: Digital apps, online portals, or internet tasks should never be mandatory prerequisites for rank advancement. Requirements must remain fully achievable without dependence on active data connections or stable electrical grids. Online quizzes and apps should remain optional tools for units with reliable connectivity.

• Educational Focus: This policy maintains equal opportunities for Scouts in rural or low-income areas. It also ensures that all participants continue to master practical skills like compass navigation, map reading, pioneering, and first aid.

5.3 Incorporate Practical Media and Algorithmic Literacy

• Operational Rule: NSOs should introduce age-appropriate digital citizenship modules that focus on evaluating online content, identifying AI-generated media and deepfakes, and recognizing online bias.

• Community Outreach: Rover/Senior Rover Scouts (Penegak and Pandega) can apply these skills by running simple, face-to-face media defense workshops for peers, younger troops, and local school groups.

• Educational Focus: Grounded in Safe from Harm guidelines and community service principles, this approach helps youth navigate online environments safely while giving back to their local communities.

5.4 Operational Guidance for Adult Leaders

Table 2: Leadership Contingency Matrix for Field Activities

Scenario Disruptions	Immediate Analog Backup	Expected Learning Outcome
Loss of GPS or Digital Mapping	Switch to magnetic compasses and paper topographic maps.	Develops spatial awareness, map-reading skills, and self-reliance.

Disruption of Online Quiz Apps	Revert to physical wide games, oral quizzes, and practical challenges.	Strengthens patrol teamwork, active communication, and morale.
Failure of Digital Payment Tools	Maintain a cash backup system and physical record sheets.	Fosters practical financial tracking and direct social interaction.
Unavailability of Cloud Learning Plans	Use printed guidebooks, physical logbooks, and leader demonstrations.	Encourages peer-to-peer problem solving and focused discussion.
Total Power Grid Failure or Device Battery Depletion	Halt all device-dependent logistics; transition camp administration to solar-powered/ battery-operated safety radios and manual logbooks, and pivot youth to physical 'wide games,' wilderness survival tasks, and campfire-based storytelling.	Teaches crisis adaptability, resourcefulness under resource scarcity, and reinforces the core value of the patrol system through peer-led group engagement.

6. Conclusion

The rapid development of artificial intelligence and digital media does not mean that Gerakan Pramuka or other NSOs in developing nations should avoid modern technology. Equally, it does not justify rushing to digitize core educational programs. In countries characterized by varied infrastructure quality, inconsistent electrical grids, and noticeable digital divides, a balanced hybrid approach offers a practical path forward.

By treating digital technology as a supporting tool rather than a replacement for core methods, NSOs can protect their programs from both network and power disruptions while still preparing youth for a digital world. Systemic grid failures and energy security vulnerabilities prove that a digital-only curriculum is fragile. Traditional, low-tech competencies are not merely legacy practices; they serve as an essential operational backup when physical power systems collapse. Digital platforms can still streamline administrative tasks, coordinate large events, and support

creative projects behind the scenes. However, the frontline Scouting experience must remain centered on offline, outdoor, and group-based learning.

Managing screen use during field activities protects the peer dynamics of the patrol system. Keeping advancement requirements fully offline ensures fair access for youth in under-connected or energy-deficient communities. Finally, teaching media evaluation empowers older youth to navigate online platforms critically and share those skills within their communities. Ultimately, digital tools should remain useful background assets rather than mandatory hurdles to non-formal education. By maintaining strong analog foundations that survive grid failures alongside thoughtful digital awareness, the Scouting movement can adapt to modern challenges while preserving its core mission.

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