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Improving Social Skills and Mathematics Understanding through Ethnomathematics-Based Learning at Sakola Motekar

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ABSTRACT

Ethnomathematics-based learning offers a contextual approach that connects mathematical concepts with local cultural practices. The mentoring program at Sakola Motekar is designed to improve the social skills and mathematical understanding of elementary school-age children through the integration of traditional games and ethnomathematics materials. Sakola Motekar is a non-formal educational institution in Cibunar Hamlet with 13 students and obstacles in the form of limited volunteers, teaching materials, and teacher capacity. This program targets the improvement of a minimum of 25% on mathematical ability and 25% on students' social skills after the intervention, as well as an increase in the number of permanent volunteers by at least 20% and the activation of two social media channels to strengthen marketing and sustainability. This article describes the intervention design, evaluation methodology (quantitative pre-post test and observation of social skills rubric), marketing management plan, and monitoring-evaluation framework. Theoretical studies support that ethnomathematics facilitates the understanding of concepts through cultural contexts and traditional games is effective for the development of children's social competence. The article closes with projected expected outcomes, practical implications, and sustainability policy recommendations. (Keywords: ethnomathematics, traditional games, social skills, contextual learning, social marketing).

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INTRODUCTION

Changes in children's lifestyles—including a shift from traditional to digital play—have implications for decreased social interaction and difficulty in understanding abstract mathematical concepts (partner problems). Sakola Motekar, a non-formal education initiative established in 2018 in Cibunar Hamlet, Ciamis Regency, operates highly contextual learning activities but faces several obstacles: a limited number of participants (≈13 students), a disproportionate proportion of educators with heterogeneous academic backgrounds, limited teaching materials, and a lack of permanent volunteers. This condition is the basis for designing a mentoring program that combines strengthening ethnomathematical pedagogy and marketing management for institutional sustainability.

Ethnomathematics, which was widely introduced by D'Ambrosio, describes the practices and principles of mathematics that emerge from particular cultural contexts and has been recommended as an approach to make mathematics learning more relevant and meaningful to students. Recent studies (2020–2024) indicate that ethnomathematics-based instruction—particularly when integrated with local games, crafts, and daily practices—can improve conceptual understanding, learning motivation, and students' socio-cultural awareness in both formal and non-formal education settings. Empirical findings from Indonesia and other developing contexts also demonstrate that traditional game-based learning contributes positively to social skills development, including cooperation, communication, and emotional regulation, while supporting numeracy and problem-solving abilities.

However, most existing ethnomathematics studies focus on formal school environments and short-term classroom interventions, with limited attention to non-formal community-based learning institutions. Moreover, prior research rarely integrates pedagogical strengthening with institutional sustainability strategies such as social or digital marketing. There is, therefore, a lack of empirical and practical models that simultaneously address ethnomathematics-based learning implementation and organizational resilience in small-scale, community-driven educational initiatives like Sakola Motekar.

Based on this context and theoretical evidence, the mentoring program at Sakola Motekar is designed to (1) strengthen facilitators' capacity and ethnomathematics-based teaching materials, (2) implement structured traditional game-based learning activities, (3) build a social (digital) marketing system to support institutional sustainability, and (4) conduct monitoring and evaluation to assess learning outcomes and marketing effectiveness.

The target of a 25% improvement (e.g., in student participation, learning engagement, and institutional visibility) is considered realistic and measurable given the small initial baseline of participants and organizational capacity. This percentage aligns with similar community education intervention benchmarks reported in recent non-formal education programs and is consistent with the program proposal and budget plan (RAB), ensuring feasibility within the implementation period.

THEORETICAL STUDIES

Ethnomathematics: Concepts, Scope, and Cultural Relevance

The term ethnomathematics was introduced by D'Ambrosio (1985) to describe how each cultural group develops distinct ways of counting, measuring, classifying, reasoning, problem-solving, and representing reality. Analytically, this concept positions mathematics not as a universal, value-free discipline detached from human experience, but as knowledge embedded in cultural practices, social

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interactions, and historical contexts. This perspective shifts the dominant paradigm from "mathematics as pure abstraction" to "mathematics as a culturally situated human activity."

Recent international scholarship (2018–2024) has further expanded this view by emphasizing that ethnomathematics is not merely about identifying mathematical elements in culture, but about recognizing culture as an epistemological foundation of mathematical knowledge. Rosa and Orey (2019, 2021) argue that ethnomathematics functions as a bridge between academic mathematics and students' lived realities, enabling learners to negotiate meaning across cultural and formal knowledge systems. Similarly, Barton (2018) highlights that mathematical practices are inseparable from language, values, and power relations within a culture.

In educational contexts, ethnomathematics goes beyond cultural representation and focuses on pedagogy. Culture is not treated as a decorative add-on, but as a source of knowledge, a cognitive structure, and an authentic learning environment. Empirical studies across diverse cultural settings—such as indigenous communities in Latin America, Africa, and Southeast Asia—demonstrate that ethnomathematics-based instruction significantly improves conceptual understanding, mathematical reasoning, and learning motivation (Rosa et al., 2020; Gerdes, 2019; Zhang & Zhang, 2022). These findings reinforce the argument that mathematics learning becomes more meaningful when students engage with concepts grounded in their cultural experience.

Sundanese Ethnomathematics at Sakola Motekar

In Sundanese society, mathematical ideas related to number, pattern, space, logic, and proportional reasoning are embedded in traditional games, handicrafts, settlement layouts, agricultural cycles, traditional measurement systems, and collective decision-making practices. Sakola Motekar, as a culture-based non-formal educational institution, provides an ideal context for ethnomathematics implementation because learning activities are situated within cultural rituals, Sundanese language use, traditional games, and everyday social practices familiar to students.

Empirical ethnomathematics research supports the effectiveness of such contextualization. Studies conducted in Indonesia, Brazil, and Ghana show that students exposed to culturally grounded mathematical activities demonstrate higher engagement, improved problem-solving strategies, and stronger socio-cultural awareness compared to those taught using decontextualized methods (Utami et al., 2021; Rosa & Shirley, 2022; D'Ambrosio & Knijnik, 2020).

Analytically, Sakola Motekar's position is distinctive because it does not merely teach mathematics using Sundanese cultural artifacts, but uses culture as a medium for developing social competencies. Values such as gotong royong (mutual cooperation), musyawarah (deliberation), collaboration, and respectful communication are inseparable from Sundanese cultural identity. International ethnomathematics literature increasingly emphasizes this social dimension, arguing that cultural mathematical practices inherently involve social negotiation, shared meaning-making, and collective reasoning (Bishop, 2019; Rosa et al., 2021).

The Concept of Social Skills in Education: A Cultural Perspective

Social skills refer to the ability to interact effectively with others through communication, cooperation, empathy, emotional regulation, and adaptation to social norms. In educational research, social skills are widely recognized as foundational to learning readiness, problem-solving capacity, and active participation (Gresham & Elliott, 2014). More recent studies confirm that social competence strongly

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predicts academic engagement and persistence, particularly in collaborative and inquiry-based learning environments (OECD, 2021; Wentzel et al., 2020).

However, a growing body of international research critiques the assumption that social skills are culturally neutral. Instead, social behaviors are shaped by cultural norms, values, and communicative traditions (Rogoff, 2018; Markus & Kitayama, 2020). This critique is particularly relevant in culturally grounded learning environments such as Sakola Motekar.

First, social skills are culturally constructed. The ways Sundanese children express respect, cooperation, and participation differ from those in other cultural contexts. Research in culturally responsive education shows that when social skills are assessed or taught without cultural sensitivity, students' competencies may be misinterpreted or undervalued (Gay, 2018; Paris & Alim, 2019).

Second, collaboration and communication have cultural dimensions. Sundanese values such as silih asah, silih asih, silih asuh (mutual learning, mutual care, and mutual nurturing) shape interaction patterns in group activities. Language levels in Sundanese (undak-usuk basa) influence how children negotiate ideas, express disagreement, and engage in collective reasoning. Empirical studies in ethnomathematics classrooms demonstrate that culturally aligned communication structures foster deeper participation and more equitable collaboration (Rosa & Orey, 2021; Bishop, 2019).

Third, cultural identity strengthens social participation. When students see their culture represented as legitimate knowledge in learning, their sense of belonging and social confidence increases. International studies confirm that culturally sustaining pedagogy enhances students' willingness to participate, collaborate, and take intellectual risks (Paris & Alim, 2019; OECD, 2021). In ethnomathematics-based environments, cultural recognition directly contributes to both social engagement and cognitive developmen.

METHOD

Program Design and Evaluation Approach

The program used a pre-post quasi-experimental intervention design with a mixed methods approach: quantitative data (pre-test/post-test on numeracy skills; social media statistics), and qualitative data (observation of social skills rubrics, in-depth interviews with teachers/parents, field notes). The quantitative evaluation is aimed at measuring the target of a minimum improvement of 25% in mathematical ability and 25% in social skills as formulated in the proposal. The activity is designed as an evidence-informed community service program with a structured evaluation component. Data collection and analysis procedures are planned to assess program effectiveness and improvement, rather than to produce statistically generalizable findings. Therefore, references to methods and analyses should be interpreted as planned or intended procedures within the program lifecycle.

Preparation & Initiation

- Form an implementation team (lecturers, students, local teachers, customary/community leaders).
- Initial socialization to the school and community (goals, benefits, duration).
- Signing of a simple MoU/SME (role, facilities, ethics).

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Needs Assessment

- Classroom & environmental observation: identification of traditional games, local practices, languages, and relevant cultural materials.
- Surveys/meetings focus with teachers, students, parents, and cultural figures to find out the needs of social skills & math difficulties.
- Results: a map of needs (potential ethnomathematical topics and competency levels).

Formulation of Goals & Targets

- General and special purpose (SMART). Example: "Increased cooperative social skills score by X% and fraction comprehension in class IV in 6 months."
- Target participants (class/level, number of students, teachers).

Intervention Design / Mini Curriculum

- Choose an ethnomathematical theme (e.g., weaving patterns, congklak games, traditional sizes/sizes, traditional house architecture).
- Design project-based learning modules: maths learning objectives + social activities (discussions, deliberations, presentations).
- Differential learning: activities for homogeneous & heterogeneous groups.

Material Development & Teacher Training

- Create modules, student activity sheets (LKS), facilitator guides, visual materials/local props.
- Teacher & facilitator training: ethnomathematical pedagogy, social skills observation techniques, authentic assessment.

Full Implementation

- Implement modules according to the program lesson plan/calendar (e.g., 8–12 thematic meetings).
- Periodic field assistance by the team (coaching on the job).

Formative Monitoring & Evaluation During the Program

Observations, facilitator diaries, and weekly meetings for reflection and adaptation.

Summative Evaluation & Reporting

- Pre–post measurement (maths & social skills), in-depth interviews, student portfolios.
- Analysis, conclusions, recommendations, and sustainability plans.

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Statistical Power and Methodological Justification

Given the relatively small number of participants (N ≈ 13), the statistical power for large-scale inferential analysis is limited. Consequently:

- Quantitative analysis focuses on within-group pre–post change rather than between-group comparisons.
- Paired t-tests or Wilcoxon signed-rank tests are employed exploratorily, depending on data distribution.
- Effect sizes (e.g., Cohen's d or r) are reported to complement significance testing and to indicate practical impact.
- Considering the community-based, culturally situated, and non-formal nature of the program, a qualitatively driven mixed-methods approach is justified. Qualitative data play a central role in explaining how and why changes occur, aligning with best practices in ethnomathematics and community education evaluation.

Instrument Validation Procedures

Numeracy Pre–Post Test

- Content validity is ensured through alignment with relevant numeracy competencies and review by mathematics education experts and local teachers.
- Test items are contextually adapted to reflect local cultural practices and traditional games, without altering the underlying mathematical constructs.
- A limited readability and feasibility check is conducted with students of similar age and background.

Social Skills Observation Rubric

- The rubric measures cooperation, communication, problem-solving, and leadership using a 4-point scale.
- Construct validity is established through clear operational definitions for each indicator and score level.
- Inter-observer reliability is supported through facilitator training sessions and calibration discussions prior to data collection.

Qualitative Instruments

- Interview and focus group protocols are semi-structured and reviewed by subject-matter experts.
- Pilot questioning is conducted to ensure clarity and cultural appropriateness.

Ethical Considerations

Although this activity is categorized as a community service program rather than formal human-subject research, ethical principles are rigorously applied:

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Informed consent

- Parents or guardians receive clear information regarding program objectives, activities, and data collection procedures.
- Participation is voluntary, and participants may withdraw at any time.

Child protection

- All learning activities are age-appropriate, non-invasive, and play-based.
- No physical or psychological risks are anticipated.

Confidentiality and data protection

- Participant identities are anonymized in all reports and publications.
- Data are used solely for evaluation and academic reporting purposes.

Institutional approval

Program implementation is authorized by Sakola Motekar management and formalized through a simple memorandum of understanding (MoU) with local partners.

Participants and Locations

The main target is all participants registered at Sakola Motekar (N≈13) with an age range of 7–12 years; and volunteers/facilitators (PGSD students and community volunteers). The activity took place in the courtyard/room of Motekar School, Cibunar Village, Ciamis Regency. The accompanying team consists of lecturers (coordinators), executive members, students, and local volunteers as stated in the proposal.

Learning Interventions

Interventions are built into ethnomathematics learning modules that integrate traditional games (e.g., sasalimpetan, congklak, pecle, and other local games) with mathematics learning objectives (patterns, numbers, flat builds, measurements). The intervention cycle includes: preparation of modules & teaching materials (ethnomathematics LKPD, flashcards), facilitator training (~10 weeks intensive), implementation of structured learning (weekly meetings), as well as mini-event activities for community involvement. Procurement of teaching aids and materials is budgeted accordingly

Training & Capacity

Facilitator training includes ethnomathematical pedagogy, classroom management, observation/assessment techniques, and production of promotional content. The marketing team received training in social media account management, content creation (video & poster), and local media relations. An additional goal is to train some facilitators as local trainers (training-of-trainers) to ensure sustainability.

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Measurement Instruments

- Pre–Post Numeracy Test: standard instrument for the topic being taught (objective questions adapted to the local curriculum); analysis using paired t-tests (or Wilcoxon if n is small/abnormal).
- Social Skills rubric: structured observations on aspects of cooperation, communication, problem-solving, and leadership during play (scale 1–4).
- Marketing KPIs: post frequency, reach, engagement, number of YouTube subscribers, local media coverage, and new participant registration data.
- Interviews & Focus Groups: to capture teachers, parents, and volunteers' perceptions of behavior change and barriers.

Data Analysis

Quantitative data were analyzed descriptively and inferentially to assess pre-post changes; Qualitative data are analyzed thematically to understand the mechanisms of change, implementation barriers, and adaptation recommendations. Quantitative results are accompanied by qualitative triangulation for internal validity.

RESULTS AND DISCUSSION

This section presents the projected outcomes, impact indicators, and theoretical justification of the intervention. This article is a program design and evaluation protocol, not a report of completed empirical research. Accordingly, the outcomes described below represent expected or projected impacts based on prior literature, the program logic model, and the indicators specified in the approved proposal.

(1) an increase in an average numeracy score of at least 25% from baseline after the intervention; (2) an increase in the social skills rubric score of at least 25%; (3) increase in the number of permanent volunteers by at least 20%; (4) the activation of two promotional channels (Instagram & YouTube) with a regular content schedule and a minimum of two local media coverage during the program period. These targets are in line with the outputs promised in the proposal. Ethnomathematics and Concept Understanding: Approaches that relate mathematical concepts to local cultural practices facilitate understanding because students can relate abstractions to their concrete experiences. The classical literature by D'Ambrosio (1985) and subsequent reviews confirms that ethnomathematics helps with the relevance of learning and student motivation.

FIGURE 1. Socialization and program planning

Traditional Games and Social Skills: Studies from the Indonesian context show that traditional games

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improve the ability to cooperate, communicate, and self-regulate in children (e.g. Irmansyah, Riadi, local journal upload). Game-based interventions provide a natural context of social interaction for the practice of these skills. Evidence Synthesis in Indonesia: Systematic reviews and recent studies show an increasing trend of ethnomathematics research in Indonesia and positive evidence of cultural integration into mathematics learning—supporting the relevance of implementation at Sakola Motekar. Based on this evidence, the projection of 25% increase is realistic if the intervention is implemented with fidelity (adequate training, availability of teaching materials, regular observation & feedback).

Small scale & sample strength: With N≈13, statistical tests will be limited by small sample sizes important to report effect size and qualitative triangulation to strengthen impact claims. Volunteer commitment: The sustainability of the intervention depends on the commitment of the volunteers; recruitment and incentive strategies (measuring MBKM experience for students) are key. Quality of teaching materials: The development of LKPD and culture-based learning media (flashcards, modules) needs to be carried out with the collaboration of ethnomathematicians so that the material is valid and interesting. Marketing management: Digital channel activation (IG & YT) is not just about uploading content, but rather a narrative strategy to highlight cultural values and educational impact—important for creating a content calendar and SOPs for social media administration

FIGURE 2. Ethnomathematics Learning Workshop

FIGURE 3. Ethnomathematics Learning Workshop

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FIGURE 4. Ethnomathematics Learning Workshop

Ethnomathematical approaches that relate mathematical representations to local cultural contexts have been shown to improve conceptual understanding through the activation of students' concrete experiences. D'Ambrosio (1985) asserts that ethnomathematics allows students to relate mathematical abstractions to cultural practices they are familiar with—lowering cognitive load and increasing motivation to learn. Culture-based mathematics learning also improves situated understanding (Barton, 1996; Rosa & Orey, 2011), which is an understanding that is directly connected to real-life practices.

In the Indonesian context, ethnomathematical research shows that the integration of cultural elements—traditional games, batik patterns, local architecture—has a positive impact on the ability to representation, reason, and connect mathematics (Siregar, 2020; Wijaya, 2021; Turmudi, 2017). Therefore, the projected increase in numeracy scores by 25% is within a realistic range, with the intervention note being carried out with fidelity: adequate teacher training, the use of valid culture-based LKPDs, and continuous monitoring.

Traditional Games, Collaboration, and Social Skills

Traditional Sundanese games—such as engrang, congklak, sorodot gaplok, or ulin kecrek—contain mathematical patterns as well as patterns of social interaction. Psychopedagogically, traditional games create a natural social environment rich in interaction: negotiation, shared rules, teamwork, and communication. A number of studies in Indonesia show that traditional games are effective in improving cooperation, speaking skills, empathy, and self-regulation in elementary school-age children (Irmansyah, 2019; Riadi, 2020; Hidayat & Rohman, 2018).

Game-based interventions provide students with the opportunity to practice social skills in real-life situations, rather than simulations. Thus, the target of increasing social skills scores by 25% is very possible when:

- games are selected according to mathematical material;
- facilitators use consistent observation rubrics;
- Reflection activities are integrated into each session.

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Projected Outcome Metrics and Indicators

Based on the evaluation framework and targets defined in the program proposal, the intervention is expected to achieve the following outcomes:

- Numeracy skills:

  An increase of at least 25% in average numeracy scores from baseline to post-intervention, as measured by a context-adapted pre–post numeracy test.

- Social skills development:

  An increase of at least 25% in social skills rubric scores, particularly in cooperation, communication, problem-solving, and leadership during traditional game-based activities.

- Institutional sustainability:

  An increase of at least 20% in the number of permanent or semi-permanent volunteers, including student volunteers engaged through service-learning or MBKM-related schemes.

- Digital visibility and outreach:

  The activation of two digital promotion channels (Instagram and YouTube) with a regular content schedule, and a minimum of two local media coverages during the program period.

These indicators align with the outputs and performance benchmarks committed to in the original proposal and budget plan.

Theoretical and Empirical Basis for Impact Projections

Ethnomathematics and Conceptual Understanding

Ethnomathematical approaches that connect mathematical concepts to local cultural practices support conceptual understanding by allowing learners to relate abstract ideas to concrete, familiar experiences. D'Ambrosio (1985) conceptualized ethnomathematics as a means of linking formal mathematics with culturally situated practices, thereby increasing relevance and learner motivation. Subsequent international scholarship has demonstrated that culture-based mathematics learning enhances situated understanding, reduces cognitive load, and strengthens conceptual connections (Barton, 1996; Rosa & Orey, 2011).

In the Indonesian context, studies integrating traditional games, batik patterns, local architecture, and indigenous measurement systems into mathematics instruction report improvements in representation, reasoning, and conceptual linkage (Siregar, 2020; Wijaya, 2021; Turmudi, 2017). On this basis, a 25% improvement in numeracy is considered a realistic projection when the intervention is implemented with high fidelity—including adequate facilitator training, validated ethnomathematics-based worksheets (LKPD), and continuous monitoring.

Traditional Games, Collaboration, and Social Skills

Traditional Sundanese games—such as congklak, engrangan, sorodot gaplok, and ulin kecrek—embed both mathematical structures and social interaction patterns. From a psychopedagogical perspective, traditional games create natural social environments that require negotiation, shared rule-making, teamwork, and communication.

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Empirical studies in Indonesia consistently show that traditional game-based interventions positively influence children's cooperation, verbal communication, empathy, and self-regulation (Irmansyah, 2019; Riadi, 2020; Hidayat & Rohman, 2018). Unlike simulated social skills training, game-based learning enables children to practice social behaviors in authentic contexts. Therefore, a 25% projected increase in social skills scores is plausible provided that:

- games are systematically aligned with learning objectives,
- facilitators apply observation rubrics consistently, and
- structured reflection is integrated into each session.

Evidence Synthesis of Ethnomathematics Research in Indonesia

A synthesis of ethnomathematics research conducted between 2015 and 2024 indicates a substantial increase in studies focused on culturally grounded mathematics instruction in elementary education (Zaenuri & Dwidayati, 2018; Sumarmo, 2020). Across regions, these studies report that integrating local culture into mathematics learning:

- improves mathematical literacy,
- increases learning motivation,
- strengthens students' cultural identity, and
- enhances engagement and participation.

Given this accumulated evidence, the projected 25% improvement in numeracy and social skills is reasonable within a small-scale, intensive, community-based intervention such as that implemented at Sakola Motekar.

Evidence Synthesis of Ethnomathematical Research in Indonesia

A systematic literature review (2015–2024) shows a significant increase in ethnomathematics research in basic mathematics learning in various provinces (Sumarmo, 2020; Zaenuri & Dwidayati, 2018). These studies report that the integration of local cultures:

- improve mathematical literacy,
- increase learning motivation,
- strengthen students' cultural identity, and
- increase engagement during learning.

Based on this evidence, the estimated increase of 25%—both numeracy and social skills—can be seen as realistic in a small-scale intervention model such as at Sakola Motekar.

CONCLUSION

The ethnomathematics-based mentoring program at Sakola Motekar is a contextual intervention that has the potential to improve children's understanding of mathematics and social skills through the integration of traditional games and strengthening the capacity of facilitators. The series of activities—ranging from module preparation, facilitator training, learning implementation, to social marketing management—are designed to achieve the target of a minimum 25% increase in numeracy competencies

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and social skills and strengthen the sustainability of the institution through digital promotion management and training-of-trainers. The theoretical basis and empirical evidence from the literature support the effectiveness of ethnomathematics and the use of traditional games as a medium of social-mathematical learning. However, limitations such as small sample size, availability of volunteers, and quality of teaching materials must be overcome to realize the target and ensure the validity of the evaluation results. This article presents an ex-ante program design and projected impact analysis, not an ex-post evaluation of completed outcomes. At the time of writing, the ethnomathematics-based mentoring program at Sakola Motekar is either in the planning or early implementation phase, and no finalized empirical outcome data are reported in this paper. Therefore, all statements regarding improvement in numeracy, social skills, and institutional sustainability should be interpreted as intended or projected outcomes, grounded in theory, prior empirical evidence, and the program logic model. A separate article will be required to report ex-post evaluation results, including quantitative outcome data, effect sizes, and qualitative evidence once data collection is complete.

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RECOMMENDATION

Prioritize the development of ethnomathematical LKPDs and teaching aids that are relevant to the local culture - involve ethnomathematics experts or academics. Carry out facilitator training for at least 10 weeks as planned; Include weekly class observations and feedback sessions. Build digital marketing SOPs (content calendar, admin responsibilities, documentation standards) to keep IG & YT channels running continuously. Use a combination of quantitative & qualitative evidence in the final report (effect of size + narrative of behavior change) to address the limitations of small N. Plan a volunteer retention strategy, including converting experiences into MBKM credits for students and formal recognition/roles for permanent volunteers. Based on the ex-ante analysis, the following recommendations are proposed:

- For implementation:
  - ✓ Ensure intensive facilitator training and continuous coaching to maintain fidelity to ethnomathematical principles.
  - ✓ Involve ethnomathematics or mathematics education experts in the validation of learning materials.
- For evaluation:
  - ✓ Prioritize effect size reporting and qualitative triangulation in the ex-post study.
  - ✓ Clearly delimit claims of impact to the program context.
- For sustainability and scaling:
  - ✓ Strengthen the training-of-trainers (ToT) mechanism to reduce dependence on external facilitators.
  - ✓ Develop a structured digital content strategy that emphasizes cultural identity and educational impact.

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- For future research:

  Conduct longitudinal and comparative studies across multiple non-formal education sites to assess scalability and long-term effects.

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