

Needs Analysis for Developing a Motif-Orientation-Position-Size (MOP-Size) Framework in Karawo Textile Art Learning

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ARTICLE INFO	ABSTRACT
Article history: Submitted: Juny 07, 2026 Final Revised: Juny 16, 2026 Accepted: Juny 20, 2026 Published: July 07, 2026	Purpose: This study aims to analyze students' learning needs as the basis for developing a Motif-Orientation-Position-Size (MOP-Size) framework in Karawo textile art education, particularly in supporting students' ability to translate motif knowledge into structured textile composition. Methods: A descriptive quantitative needs-analysis design was employed involving 45 Visual Arts Education students who had participated in Karawo textile learning. Data were collected using a 30-item Likert-scale questionnaire covering five dimensions: learning conditions, motif-placement understanding and difficulties, perceived need for the framework, application readiness, and expected benefits. Data were analyzed using descriptive statistics, including mean, standard deviation, frequency distribution, and category analysis. Findings: The results show that all dimensions were generally in the moderate category. However, the motif-placement dimension revealed the most critical gap, with 42.22% of students in the low and very low categories. Meanwhile, the need for the framework, readiness to apply it, and perceived benefits showed positive tendencies, indicating acceptance of structured learning support. Research Implications: The findings indicate that Karawo learning requires structured scaffolding to support students' compositional decision-making. The MOP-Size framework is proposed as a preliminary instructional structure that can guide motif analysis, orientation testing, positional arrangement, and size scaling in textile design learning. Originality: This study introduces MOP-Size as a context-based instructional construct that operationalizes motif, orientation, position, and size as teachable variables in traditional textile education, particularly in Karawo learning.
Keywords: Applied Art Education; Karawo; MOP-Size; Motif Placement; Textile Learning.	
	
 	
Doi: https://doi.org/10.61255/jupiter.v4i3.1310	

INTRODUCTION

Applied education in art and design is increasingly expected to connect cultural heritage with systematic learning experiences that prepare students to solve authentic design problems. This expectation is highly relevant to Karawo, a Gorontalo embroidery and textile tradition that functions not only as a craft product but also as a cultural identity resource. Karawo is produced through a distinctive openwork embroidery process in which motifs are formed by cutting, pulling, and reworking threads on the textile surface. Previous studies have positioned Karawo as a real cultural form, a marker of local identity, and a creative industry product (Sudana, 2019). Its sustainability depends on the ability of craftsmen and students to reinterpret motifs without losing cultural meaning. Karawo learning therefore cannot be reduced to technical stitching alone. It also requires students to understand how motif choices, spatial placement, scale, and directional flow communicate visual order and cultural values.

Applied art education is increasingly expected to integrate cultural heritage with structured learning approaches that enable students to solve authentic design problems. In this context, local textile traditions are not only treated as cultural artifacts but also as pedagogical resources that support visual literacy, design thinking, and creative problem-solving (Autio, 2016; Bide, 2021; Caban & Scott, 2016; Garcia et al., 2022).

One of the most significant local textile traditions in Indonesia is Karawo, a distinctive Gorontalo embroidery technique characterized by an openwork process in which threads are selectively cut, pulled, and re-embroidered to form decorative motifs. Beyond its technical uniqueness, Karawo represents cultural identity, aesthetic values, local creative industry potential, and opportunities for contemporary motif development (Mohamad et al., 2018; Sudana, 2019). Its sustainability depends on how effectively it is transmitted within educational settings, particularly in art and design programs, while also responding to the broader modernization of craft practices (Chauhan, 2022).

However, Karawo learning in higher education is still predominantly practice-oriented and tends to emphasize procedural reproduction rather than structured design reasoning. Students are generally introduced to motifs through demonstration and imitation, but less frequently guided to systematically analyze compositional variables such as orientation, position, and size. Similar concerns have been raised in craft and textile learning, where procedural mastery, authenticity, and design individuality need to be connected with explicit design reasoning (Mandour, 2022). As a result, while students may understand motif forms, they often experience difficulties when translating these motifs into balanced textile compositions.

Previous studies have highlighted various aspects of Karawo development, including motif engineering, cultural symbolism, and digital motif generation (Hasdiana et al., 2019; Latief & Tuloli, 2024; Syahrial & Lamusu, 2021). These studies contribute significantly to understanding Karawo as both a cultural and technological object. Nevertheless, most of these works focus on motif production or digital transformation rather than on pedagogical scaffolding that explicitly structures students' compositional decision-making processes.

In addition, broader research in textile and design education emphasizes the importance of iterative studio practices, reflective learning, and the integration of visual, material, digital, and conceptual thinking (Gafvels & Lindberg, 2021; Hameed & Mimirinis, 2023; Karna-Behm & Harjuniemi, 2023; McSweeney et al., 2025; Motta & Dumitrescu, 2022; Queiroz et al., 2022; Souza & Kohan, 2024; Zhang et al., 2022, 2024). Studies on sustainable fashion, upcycling, and color learning also show that textile education can connect cultural, material, environmental, and creative dimensions (Garcia et al., 2022; Igoe et al., 2021; Lara et al., 2023). Despite these advances, there remains a limited pedagogical framework that operationalizes compositional variables into teachable units, particularly in the context of traditional textile learning.

To address this gap, this study proposes the Motif–Orientation–Position–Size (MOP-Size) framework as an initial instructional construct for Karawo textile art education. The framework is designed to translate abstract design principles into four operational variables that can be explicitly taught, practiced, and assessed. These variables include motif selection as cultural representation, orientation as directional control, position as spatial arrangement, and size as proportional scaling. Accordingly, this study aims to analyze students' learning needs as the foundation for developing the MOP-Size framework in Karawo textile art education. Specifically, this study addresses the following questions:

1. How do students perceive the current conditions of Karawo textile art learning?
2. What difficulties do students experience in applying motif, orientation, position, and size in textile composition?
3. To what extent do students perceive the need for a structured MOP-Size learning framework?
4. How ready are students to apply such a framework in Karawo learning contexts?
5. What benefits do students expect from the implementation of the MOP-Size framework?

This study positions itself as a needs analysis rather than an effectiveness study. Therefore, the contribution lies in identifying instructional gaps and translating them into a structured conceptual framework that can be further validated in future experimental and developmental research.

METHOD

Research design

This study employed a descriptive quantitative needs-analysis design. The purpose of this design was to identify learning gaps and student perceptions as the foundation for developing a preliminary instructional framework, namely the Motif-Orientation-Position-Size (MOP-Size) model in Karawo textile art education. The study did not aim to test the effectiveness of an intervention, but rather to explore instructional needs in a specific learning context.

Participants and context

The study involved 45 students from a Visual Arts Education program who had previously participated in Karawo textile art learning activities. A purposive sampling technique was used to select participants who had direct experience in motif design and textile composition tasks. Although the sample size is relatively limited, it is considered appropriate for a needs-analysis study that focuses on contextual perception mapping rather than population generalization. The findings are therefore interpreted as context-specific and not intended for statistical generalization beyond the study setting.

Instrument

Data were collected using a structured questionnaire consisting of 30 Likert-scale items distributed across five dimensions: (1) learning conditions, (2) motif-placement understanding and difficulties, (3) perceived need for the MOP-Size framework, (4) application readiness, and (5) expected benefits. Each dimension consisted of six items with a five-point response scale.

Table 1. Instrument blueprint and operational indicators of the needs analysis

Dimension	Operational focus	Example indicator	Score range
Learning conditions	Current learning support, media, and studio guidance	Students perceive whether existing Karawo learning provides sufficient design guidance	6-30
Motif-placement understanding/difficulties	Ability and difficulty in applying motif, orientation, position, and size	Students evaluate difficulty in placing, rotating, scaling, and arranging motifs	6-30
Need for MOP-Size model	Perceived need for a structured design framework	Students judge whether explicit MOP-Size guidance is necessary	6-30
Application readiness	Readiness to use templates, grids, sketches, and critique activities	Students evaluate willingness and preparedness to apply the framework	6-30
Expected benefits	Expected contribution to composition quality, cultural relevance, and reflection	Students predict benefits for learning outcomes and design reasoning	6-30

The instrument was developed based on literature on textile design education and the conceptual structure of MOP-Size. However, because this study represents a preliminary needs analysis, formal psychometric testing such as construct validity, factor analysis, and reliability coefficient estimation was not conducted due to the absence of item-level raw data in the final dataset. This limitation is acknowledged as a methodological constraint, and future research is recommended to conduct full instrument validation involving expert judgment and statistical testing.

Data collection

The questionnaire was administered after students completed Karawo textile learning sessions. Participants were asked to evaluate their learning experience, perceived difficulties in motif composition, perceived need for structured guidance, readiness to apply design scaffolding, and expected benefits of such a framework. All responses were collected and summarized at the group level for analysis.

Data analysis

Data were analyzed using descriptive statistical techniques, including mean, standard deviation, minimum and maximum scores, frequency distribution, and percentage analysis. Responses were categorized into five levels: very low, low, moderate, high, and very high. In addition, two synthesized indicators were used: (1) low and very low percentage as an indicator of learning difficulty, and (2) high and very high percentage as an indicator of positive readiness and perceived benefit. Given the exploratory nature of the study and the use of aggregated data, inferential statistical analysis was not performed. The results are intended to provide an initial empirical basis for instructional model development rather than hypothesis testing.

Ethical Considerations

Participation was voluntary, and data were analyzed anonymously at the group level. No personal identifiers were collected. The study was conducted in accordance with academic research ethics for educational studies.

Methodological Limitations

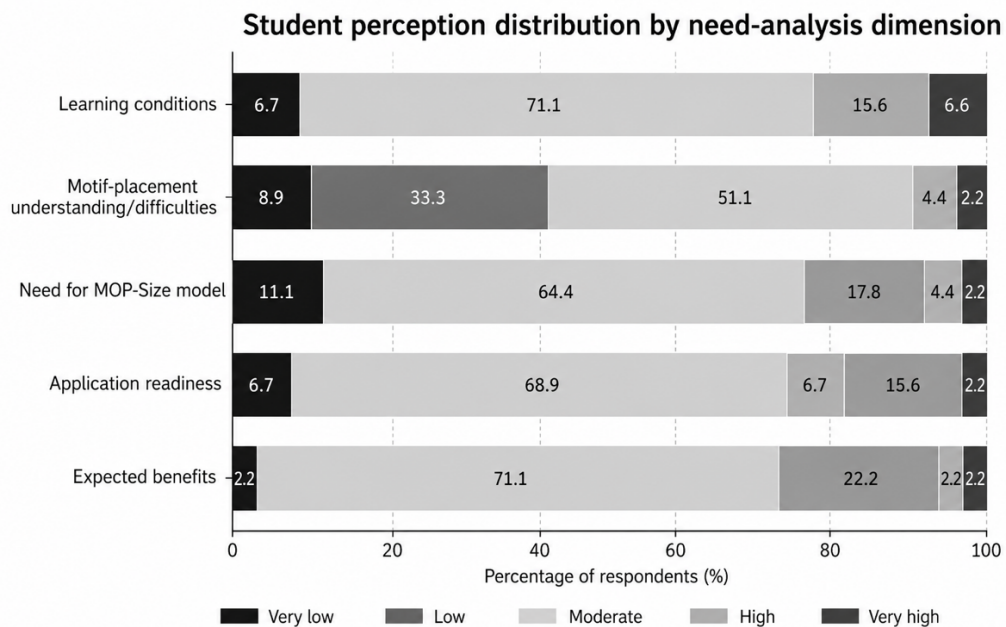
This study has several limitations. First, the relatively small sample size restricts statistical generalization. Second, the use of aggregated data prevents item-level psychometric validation, including reliability and factor structure analysis. Third, the study relies on self-reported perceptions, which may not fully represent actual design performance. Therefore, the findings should be interpreted as a preliminary needs analysis that serves as a basis for further model development, expert validation, and experimental testing.

RESULTS

The results of the needs analysis are presented based on five measured dimensions: learning conditions, motif-placement understanding and difficulties, need for the MOP-Size framework, application readiness, and expected benefits. Table 2 summarizes the descriptive statistics and categorical distribution across these dimensions.

Table 2. Descriptive profile and category signals across five needs-analysis dimensions

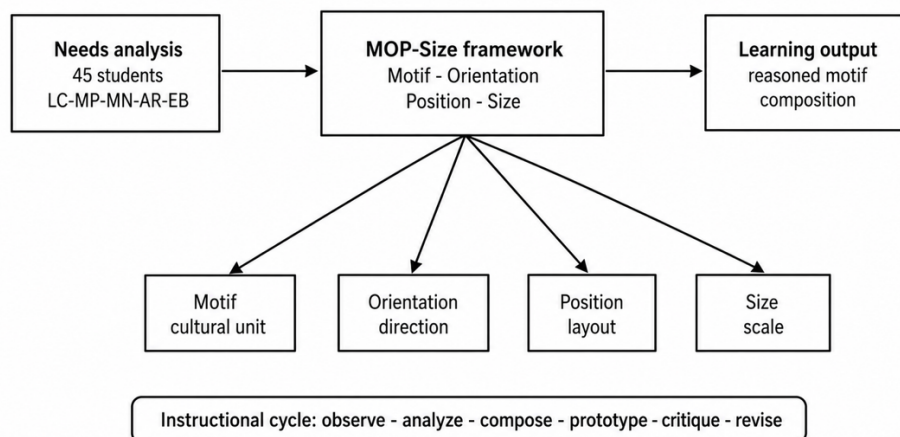
Code	Dimension	Min	Max	Mean	SD	Dominant category	Dominant %	Low + very low %	High + very high %
LC	Learning conditions	12	30	24.93	3.11	Moderate	71.11	8.89	20.00
MP	Motif-placement understanding/ difficulties	13	30	22.84	3.31	Moderate	51.11	42.22	6.66
MN	Need for MOP-Size model	12	30	25.04	3.39	Moderate	64.44	13.33	22.22
AR	Application readiness	10	30	25.18	3.47	Moderate	68.89	8.89	22.23
EB	Expected benefits	12	30	25.33	3.47	Moderate	71.11	4.44	24.44



Note: Percentages may not sum to 100 due to rounding.

Figure 1. Student perception distribution by needs-analysis dimension

Overall, all dimensions were predominantly in the moderate category, indicating that Karawo textile learning is functioning at an acceptable level but still requires structured pedagogical reinforcement. However, differences across dimensions reveal distinct instructional priorities. The learning conditions dimension recorded a mean score of 24.93, with 71.11% of students in the moderate category. This indicates that existing instructional practices provide a functional learning environment, but students still require clearer scaffolding in design reasoning and compositional structure.

**Figure 2.** Needs-based conceptual logic of the proposed MOP-Size Karawo learning framework

The most critical finding appears in the motif-placement understanding and difficulties dimension, which recorded the lowest mean score (22.84) and the highest proportion of low and very low responses (42.22%). This indicates that students experience significant difficulty in translating motif knowledge into compositional decisions involving orientation, position, and size. This dimension directly corresponds to the core construct of the MOP-Size framework, suggesting that the most urgent instructional gap lies in compositional control rather than motif recognition itself.

In contrast, the need for the MOP-Size framework (mean = 25.04), application readiness (mean = 25.18), and expected benefits (mean = 25.33) showed relatively positive tendencies. Although most responses remained in the moderate category, the proportion of high and very high responses ranged between 22.22% and 24.44%. This pattern indicates that students are not only experiencing difficulty but are also open to structured support and perceive potential benefits from a more systematic learning approach.

A comparative analysis across dimensions shows an important pattern: while students assess current learning conditions as adequate, their difficulties increase significantly when dealing with compositional transformation tasks. This gap becomes the conceptual justification for the MOP-Size framework, which operationalizes composition into four measurable variables: motif, orientation, position, and size.

When the dimensions are interpreted as a system, motif-placement difficulty acts as the central bottleneck, while readiness, need, and expected benefits function as enabling factors for instructional intervention. This indicates that the proposed framework is not merely an abstract concept but directly addresses the most critical learning constraint identified in the dataset. In summary, the results demonstrate a clear instructional gap in compositional decision-making within Karawo textile learning. At the same time, student readiness and perceived usefulness suggest that the development of a structured framework such as MOP-Size is pedagogically feasible and contextually relevant.

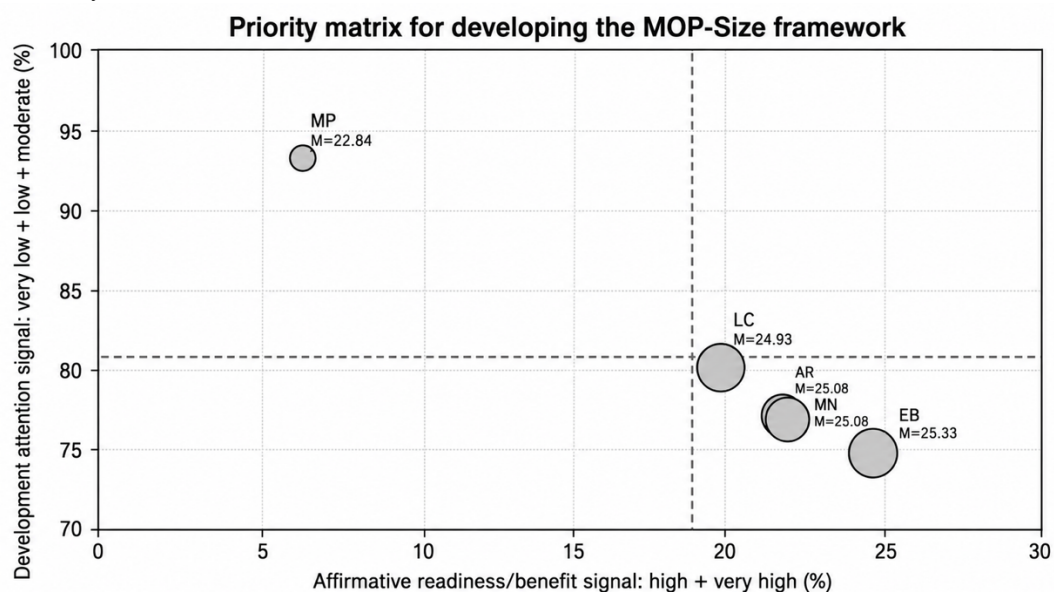


Figure 3. Priority matrix for developing the MOP-Size Karawo framework

DISCUSSION

The findings of this study indicate that Karawo textile art learning is in a transitional pedagogical condition, in which students demonstrate moderate understanding of learning processes but still experience significant difficulty in compositional decision-making, particularly in motif placement. This pattern suggests that current instructional practices provide adequate exposure to technical and cultural aspects of Karawo, yet do not sufficiently support structured design reasoning.

The most significant issue identified in this study is the difficulty students experience in translating motif knowledge into compositional structures involving orientation, position, and size. This finding aligns with previous research in textile education, which shows that students in craft-based learning environments often develop strong procedural skills but limited conceptual control over design variables (Mokanaasri & Kumar, 2025; Mandour, 2024). In such contexts, learning tends to emphasize replication and production outcomes rather than explicit design decision-making processes.

Table 3. Empirical findings and instructional responses in the proposed MOP-Size framework

Empirical finding	Learning problem	MOP-Size response	Instructional activity	Expected outcome
42.22% low or very low in motif placement	Students struggle to translate motif knowledge into composition	Motif + orientation + position + size	Motif cards, rotation trials, grid placement, scale testing	More reasoned textile composition
Learning conditions dominated by moderate responses	Existing learning functions but lacks explicit compositional scaffolding	Structured learning cycle	Observe, analyze, compose, prototype, critique, revise	Clearer studio sequence and documentation
Need, readiness, and benefits show positive signals	Students need gradual implementation rather than immediate independence	Guided-to-independent progression	Teacher modelling, worksheet practice, peer critique	Improved readiness for design tasks
Expected benefits are comparatively strong	Students see practical value in structured motif learning	Assessment rubric	Evaluate cultural meaning, balance, neatness, and revision	More accountable learning evidence

When compared with broader design education literature, similar challenges have been reported in studio-based learning environments where students struggle to articulate and justify spatial and proportional decisions in their work (McSweeney et al., 2025; Gafvels & Lindberg, 2021). These studies emphasize that without explicit scaffolding, students often rely on intuition rather than systematic reasoning when composing visual elements. The present findings extend this argument to the context of Karawo textile learning, where cultural motifs add another layer of complexity to compositional decision-making.

The moderate levels observed in learning conditions, readiness, and perceived benefits suggest that students are not resistant to structured learning interventions. Instead, they indicate partial readiness for more explicit instructional guidance. This is consistent with findings in applied arts education that highlight student openness to structured frameworks when such frameworks remain flexible and context-sensitive (Lewis & Stasiulyte, 2022; Hameed & Mimirinis, 2023).

However, it is important to critically position the proposed MOP-Size framework within the broader discourse of design pedagogy. While similar frameworks in design education often emphasize iterative studio cycles, reflective practice, and material experimentation, they do not always operationalize compositional variables into clearly defined instructional units. In this sense, MOP-Size attempts to translate abstract design principles into four observable and teachable components: motif, orientation, position, and size.

Nevertheless, this study does not claim that MOP-Size is superior to existing pedagogical models such as studio-based learning or project-based learning. Instead, it should be understood as a contextual adaptation that responds to a specific instructional gap in Karawo textile education. Its contribution lies in its attempt to make compositional thinking more explicit and assessable in a culturally situated learning environment.

From a theoretical perspective, the findings support the view that design learning requires a balance between tacit knowledge and explicit instructional structure. While tacit knowledge is essential in craft traditions, excessive reliance on implicit learning may limit students' ability to systematically control design variables. The MOP-Size framework can therefore be interpreted as a bridging mechanism between experiential craft learning and structured design cognition.

Despite these contributions, the study has limitations that affect the strength of its conclusions. The reliance on aggregated descriptive data limits deeper statistical interpretation, and the absence of psychometric validation restricts the generalizability of the findings. Furthermore, the framework remains conceptual and has not yet been tested through experimental or implementation-based studies.

Therefore, future research should focus on validating the MOP-Size framework through expert evaluation, classroom implementation, and comparative studies with existing instructional approaches in textile design education. Such studies are necessary to determine whether the framework can improve not only perceived learning needs but also actual student performance in textile composition tasks.

CONCLUSION

This study identifies a clear instructional gap in Karawo textile art learning, particularly in students' ability to translate motif knowledge into structured compositional decisions involving orientation, position, and size. Among the five analyzed dimensions, motif-placement understanding and difficulties emerged as the most critical issue,

with 42.22% of students in the low and very low categories. This finding indicates that the main challenge in Karawo learning is not motif recognition, but compositional control in textile design.

At the same time, students demonstrate moderate to positive levels of learning readiness, perceived need, and expected benefits regarding structured instructional support. This suggests that learners are open to guided design scaffolding that can help them develop more systematic reasoning in textile composition. Based on these findings, the study concludes that a structured instructional approach is needed to support compositional learning in Karawo textile education. The proposed Motif–Orientation–Position–Size (MOP-Size) framework offers a preliminary conceptual structure that translates abstract design principles into four teachable and observable variables.

The main contribution of this study lies in providing an empirically grounded needs-analysis basis for developing a structured learning framework in traditional textile education. Rather than evaluating the effectiveness of a model, this study establishes the instructional necessity and conceptual direction for future model development. Future research should focus on validating the MOP-Size framework through expert judgment, classroom implementation, and comparative studies with other instructional models in design education. Such studies are essential to determine its pedagogical effectiveness and its impact on students' actual design performance.

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ACKNOWLEDGEMENT

The author would like to thank the students and academic community who were involved in the learning context of Karawo textile arts. Special appreciation is given to the Head of the Department, and fellow lecturers in Visual Arts Education, who participated in discussions to finalize this data. The author also thanks Promoters and Co.Promoters generously shared their experiences and perspectives, which significantly enriched the findings of this research. Finally, the author would like to thank all those who have helped contributed, either directly or indirectly, to the completion of this research.

AUTHOR CONTRIBUTION STATEMENT

Hasdiana conceptualized the study, developed the research design, and supervised the overall data interpretation. Abd. Kadim Masaong conducted the literature review, contributed to the theoretical framework, and drafted the initial manuscript. Sitti Roskina Mas prepared the data analysis, visualizations, and tables. Lukman AR Laliyo assisted in manuscript refinement, formatting, and preparation of submission documents. All authors critically reviewed the manuscript, provided intellectual input, and approved the final version for submission.

AI DISCLOSURE STATEMENT

The author declares that, in the preparation of this manuscript, limited use has been made of artificial intelligence (AI), specifically for the improvement of grammar, sentence clarity and the neatness of the writing structure. The use of AI did not extend to the formulation of research ideas, data collection and analysis, or the drawing of conclusions. The author takes full responsibility for the entire content, accuracy, and scientific integrity of this manuscript.

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