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A symbolic-philosophical kawung batik–based mathematical mindset intervention in STEAM education: A conceptual design

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Abstract: Research on the relationship between mathematical attitudes and cultural values is lacking, especially in non-Western educational contexts. This study proposes mindset interventions based on the philosophical and symbolic interpretations of Kawung Batik, a Javanese motif expressing harmony, resilience, self-reflection, and social connectivity. The methodology combines theoretical literature with a cultural-symbolic understanding of Kawung's relevance. Psychological dimensions of mathematical mindset: beliefs about ability, reactions to adversity, attitudes toward failure, appreciation of effort, openness to critique, and perceptions of peer success. The symbolic constructs are carefully aligned with these dimensions. The framework includes four STEAM pedagogical designs: reconstructing geometric shapes, algorithmically producing patterns, studying batik materials and processes, and critically reflecting on cultural significances. These scenarios stimulate emotional and cognitive development and promote a culturally integrated mathematical identity. The proposed methodology reframes culture as a powerful tool for transforming students' mathematics learning experiences. This study lays the groundwork for classroom-based research, including iterative design studies to confirm the model's pedagogical and affective effects.

Keywords: mathematical mindset; ethnomathematics; Kawung Batik; STEAM education; culturally responsive pedagogy

Intervensi Mindset Matematika Berbasis Makna Simbolik-Filosofis Batik Kawung dalam Pendidikan STEAM: Sebuah Desain Konseptual

Abstrak: Penelitian tentang hubungan antara sikap matematika dan nilai-nilai budaya masih kurang, terutama dalam konteks pendidikan non-Barat. Studi ini mengusulkan intervensi pola pikir berdasarkan interpretasi filosofis dan simbolis Batik Kawung, motif Jawa yang mengekspresikan harmoni, ketahanan, refleksi diri, dan konektivitas sosial. Metodologi ini menggabungkan literatur teoretis dengan pemahaman simbolis-kultural tentang relevansi Kawung. Enam dimensi psikologis pola pikir matematika: keyakinan tentang kemampuan, reaksi terhadap kesulitan, sikap terhadap kegagalan, apresiasi terhadap usaha, keterbukaan terhadap kritik, dan persepsi terhadap keberhasilan teman sebaya. Konstruksi simbolis tersebut selaras dengan dimensi-dimensi ini. Kerangka kerja ini mencakup empat desain pedagogi STEAM: merekonstruksi bentuk geometris, menghasilkan pola secara algoritmik, mempelajari bahan dan proses batik, serta merefleksikan secara kritis signifikansi budaya. Skenario-skenario ini merangsang perkembangan emosional dan kognitif serta mendorong identitas matematika yang terintegrasi secara budaya. Metodologi yang diusulkan membingkai ulang budaya sebagai alat yang ampuh untuk mentransformasi pengalaman belajar matematika siswa. Studi ini meletakkan dasar untuk penelitian berbasis kelas, termasuk studi desain berulang untuk mengonfirmasi efek pedagogis dan afektif model.

Keywords: mindset matematika; etnomatematika; Batik Kawung; pendidikan STEAM; culturally responsive pedagogy

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INTRODUCTION

Recent research in mathematics education have emphasized the need of a mathematical mindset, grounded in Dweck's theory of growth mindset, for enhancing student learning outcomes throughout the past decade (Saefudin et al., 2023). The conviction that mathematical abilities may be acquired via diligence and perseverance is associated with enhanced academic achievement. Im & Park (2023) created a reliable scale to assess mathematical mentality, distinct from the general growth mindset, associated with reduced math fear and increased engagement. The impact of growth mindset interventions on academic performance is contentious. Growth mindset interventions are prevalent; nevertheless, a comprehensive analysis by Macnamara and Burgoyne identified methodological faults and biases that exaggerate their influence on academic performance, revealing a minimal overall effect size when including publication bias (Macnamara & Burgoyne, 2023). Nevertheless, some research indicates that growth mindset interventions may be efficacious in specific contexts. An online intervention enhanced academic achievement in underperforming youngsters when peer norms endorsed its messages, as reported by Yeager et al. (2019). According to Sisk et al. (2018), students from low socioeconomic backgrounds or those at academic risk may derive more advantages from such interventions. Younger et al. (2024) discovered that mindset forecasts academic achievement in children possessing many risk variables. Interventions promoting a growth mindset can enhance the mathematical performance of Chinese students, with intrinsic motivation serving as a mediating factor (Huang et al., 2022). The findings indicate that a mathematical mentality can enhance student learning, contingent upon the educational environment and student attributes (Canning & Limeri, 2023; Chao et al., 2025).

However, cultural values and educational approaches in Asian nations such as Indonesia differ from Western models, highlighting the need for culturally relevant mindset interventions. Numerous Asian nations, particularly China and Indonesia, exhibit results-driven and high-pressure educational systems that are at odds with Western therapeutic approaches promoting self-expression and risk-taking. Huang et al. (2022) discovered that growth mindset interventions highlighting the plasticity of intelligence and emotion can enhance academic performance in China, indicating the significance of emotional factors in these contexts, in contrast to Western environments where intelligence is predominantly emphasized. Zhu & Leung (2011) study revealed that intrinsic and extrinsic motivations contribute to the academic success of East Asian students, whereas Western students perceive extrinsic motivation as detrimental. Brady et al. (2017) advocate for culturally informed treatments that validate diverse cultural frameworks to enhance educational interventions for minority and working-class pupils. Pham Thi Hong (2011) contends that Western student-centered learning methodologies are ineffective in Asian contexts due to cultural discrepancies and advocates for alignment with local customs. The "trapping effect" of effort in Confucian cultures, characterized by pupils experiencing psychological distress due to elevated effort and fear of failure, hampers the assimilation of a Western mindset (Fwu et

al., 2017). Kember (2000) and Kim et al. (2025) contend that Asian students can acquire knowledge through memorizing and collective motivation. Keller (2019) contend that mindset should consider the intricate emotions and attitude development inherent in non-Western cultures. Consequently, Asian educational settings require psychologically effective and culturally attuned mindset interventions to foster academic exploration and resilience.

Ethnomathematics serves as a viable approach to address this need by integrating cultural elements into the learning of mathematics (D'Ambrosio, 1985). This method facilitates the connection between mathematical concepts and familiar cultural practices, enhancing meaning, motivation, and engagement among students (Machaba & Dhlamini, 2021). The incorporation of ethnomathematics into STEAM (Science, Technology, Engineering, Arts, Mathematics) education has demonstrated the potential to enhance creativity and promote a deeper understanding of concepts (Kangas et al., 2022; Sunzuma & Umbara, 2025). Research, including that conducted by Chappell & Hetherington (2023), indicates that STEAM initiatives grounded in local culture improve innovative skills, technological literacy, and cultural identity appreciation.

In the Indonesian cultural framework, batik serves as a significant artifact imbued with both mathematical and symbolic philosophical dimensions. Specifically, Kawung batik, characterized by its aesthetically pleasing symmetrical circular motifs, encapsulates the philosophy of equilibrium, self-awareness, self-regulation, and perseverance—values that naturally resonate with the principles of a growth mindset, including resilience, persistence, and a constructive approach to errors. Nevertheless, ethnomathematical investigations concerning batik in Indonesia predominantly emphasize the geometric and patterned elements, overlooking its philosophical implications as a foundational basis for the development of students' learning dispositions or mindsets. Moreover, there exists a notable absence of a theoretical framework that explicitly correlates cultural symbols such as Kawung with the affective and cognitive transformations that are the intended outcomes of mindset interventions.

A notable gap exists in the current empirical study: (1) predominant models of mindset interventions inadequately incorporate cultural contextual factors; (2) research on Indonesian ethnomathematics has not focused on promoting psychological transformation; (3) the symbolic philosophy of Kawung has not been applied as a cognitive catalyst in educational frameworks; and (4) there is a lack of a theoretical framework explaining how cultural symbols may affect learning dispositions in STEAM education.

This theoretical investigation seeks to address the prevailing deficiency by formulating a mindset intervention framework that is firmly rooted in the philosophy and symbolism of Kawung Batik within the purview of STEAM education. This model asserts that the incorporation of Kawung values as an affective-cognitive anchor can stimulate intrinsic processes, encompassing reflection, self-meaning, and resilience, in the face of mathematical challenges via cultural symbols. This methodology aspires to amalgamate STEAM activities, such as pattern reconstruction (Mathematics and Art), motif algorithmization (Technology), batik material exploration (Engineering), and philosophical interpretation (Arts and

Humanities). This framework facilitates students' acquisition of mathematical knowledge while concurrently internalizing cultural values and embracing a growth mindset.

This article delineates several pivotal contributions: the establishment of a conceptual framework for mindset interventions that is informed by the nuances of local culture, an augmentation of the theoretical discourse surrounding the integration of cultural symbols within mindset cueing, and a STEAM learning model that amalgamates mathematics, art, technology, and the values intrinsic to local wisdom. This model has the potential to serve as a foundational basis for the creation of educational tools, intervention modules, and the execution of further inquiries via a design-based research paradigm. This paradigm aspires to advance mathematics education in Indonesia by enhancing students' cognitive competencies while concurrently fostering mental resilience, creativity, and a profound appreciation for cultural identity.

METHODS

This study utilized a conceptual research methodology to develop a mathematical mindset intervention framework that is grounded in the philosophical and symbolic dimensions of Kawung Batik, situated within the context of STEAM education. This methodological strategy was selected due to the study's emphasis on the creation of a coherent, integrated, and empirically verifiable theoretical model for future exploration, rather than emphasizing empirical validation. As delineated by Jaakkola (2020), conceptual research seeks to formulate innovative theories through the logical synthesis of concepts, as opposed to relying solely on empirical observation. This methodological framework articulates four essential components: (1) an extensive narrative review of the mentality intervention model, (2) an examination of the philosophical and symbolic implications of the Kawung motif, (3) a systematic process for the development of a conceptual model, and (4) theoretical triangulation employed as a mechanism for the validation of the conceptual framework.

Narrative Review of Mindset Intervention Models

This research started with a narrative review of growth mindset and mathematical mindset interventions in mathematics and STEAM education. Narrative reviews are appropriate for conceptual research that requires integrative flexibility because they allow researchers to find patterns, mechanisms, and underlying concepts of mindset interventions without structured methods. The narrative review covered three topics: psychological mechanisms of mindset interventions (e.g., error reinterpretation, self-belief, effort attribution); pedagogical strategies for developing a growth mindset; and mathematics and STEAM mindset interventions. Helped explain the relationship between attitude, mathematics learning, and culture (Claro et al., 2016; Peng & Kievit, 2020; Ting & Yeh, 2024). The Kawung-based mindset intervention paradigm was developed using fundamental elements from this review.

Philosophical–Symbolic Analysis of the Kawung Motif

Step two is a symbolic-philosophical analysis of the Kawung batik motif. This analysis seeks to determine the essential values of the Kawung motif and evaluate their alignment with mathematical mindset dimensions. The study investigated cultural literature, Javanese philosophy, symbolic anthropology, and batik art studies. These sources explained how Javanese tradition uses the Kawung pattern to symbolize balance, self-control, alertness, endurance, and harmony. The symbolic value analysis method builds on Geertz's cultural studies interpretative method and symbolic meaning systems (Geertz, 1976). The analysis produced a list of Kawung philosophical-symbolic values, which were matched to mathematical mindset dimensions such as mathematical ability and intelligence, challenge, difficulties, effort, criticism, and success for others. Local culture and the intervention mindset's modern psychological framework form a key link at this point.

Conceptual Model Building Procedure

The third step is conceptual model building. Model construction follows Jaakkola (2020) approach, which emphasizes logical integration, diagrammatic representation, and theoretical cause-and-effect links. There were four important milestones in model development: 1) Identifying core thinking principles; 2) Applying Kawung philosophical values to mentality principles; 3) Creating affective-cognitive pathways; 4) Including mentality in STEAM learning design. A flowchart and narrative describing the conceptual model result from this procedure.

Validation Logic through Theoretical Triangulation

This theoretical study was supported by the methodology of theoretical triangulation rather than conventional empirical experimentation. According to Jaakkola (2020), a conceptual framework is considered validated when it exhibits logical coherence, is supported by pertinent theoretical foundations, and aligns with interdisciplinary academic literature. The triangulation was based on three theoretical foundations: 1) Mindset theory was evaluated by examining the consistency of established correlations with the psychological mechanisms inherent to mindset interventions; 2) Cultural learning theory was explored through the analysis of the relationship between cultural symbols and key learning experiences; and 3) Ethnomathematics and STEAM frameworks were assessed based on the model's internal coherence.

RESULT AND DISCUSSION

The formulation of a conceptual framework for mathematical mindset intervention, anchored in the symbolic-philosophical tenets of the Kawung motif within the context of STEAM education, produces four principal outcomes: (1) correlating the symbolic significances of Kawung with the principles of mindset, (2) foundational principles for the design of interventions, (3) STEAM educational scenarios informed by the Kawung motif, and (4) a comprehensive integrative conceptual model.

Mapping Kawung Symbolism to Mindset Principles

The Kawung Batik of Yogyakarta encapsulates significant philosophical implications (see Figure 1). This motif is not only visually appealing but also embodies Javanese principles such

as balance, harmony, self-reflection, fortitude, and simplicity. According to Saefudin et al. (2023), these principles correspond with the psychological disposition dimension within the field of mathematics education, commonly designated as the mathematical mindset. The philosophical foundations of Kawung possess the capacity to aid learners in cultivating self-confidence and a positive disposition toward mathematics.

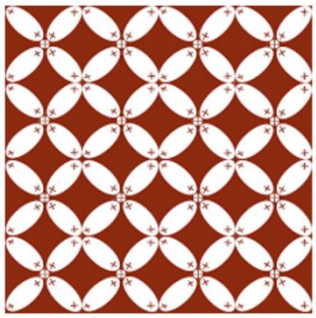

Figure 1. The Kawung Batik of Yogyakarta

The philosophical meaning of Yogyakarta's Kawung Batik is presented in Table 1 below.

Table 1. The philosophical meaning of Yogyakarta's Kawung Batik

Philosophical Aspects	Meanings	Philosophical Explanation (Yogyakarta & Javanese Context)	Reference
1. Purity & Simplicity	Purity of heart, clarity of mind, self-control	The Kawung motif is interpreted as symbolizing inner purity, the suppression of lust, and a simple life. Clean lines and minimalist forms reflect the simplicity of Javanese aesthetics	Susanto (1980); UNESCO (2018); Yogyakarta (2015)
2. Balance	Harmony in the four directions of life	The four ellipses of Kawung represent the balance between: 1. humans–God, 2. humans–others, 3. humans–nature, and 4. humans–themselves.	Haryono (2019); Sunaryo (2015)
3. Harmony	Inner and social harmony	The stable and repetitive pattern reflects the principles of harmony, tranquility, and togetherness, which are highly valued in Yogyakarta culture	Putra (2019); Yogyakarta (2015)
4. Perseverance & Resilience	Never giving up, consistency in life	The repetition of the Kawung pattern teaches that life is a cycle of ups and downs. Javanese philosophy: "urip iku sawang-sinawang"—a journey that continues to evolve	Soedarmo (2013); U.n.e.s.c.o (2009)
5. Life Cycle	A continuous learning process	he round/oval shape of the Kawung symbolizes the cycle: learning → failure → reflection → growth. This aligns closely with the philosophy of *ngleluri* (nurturing) the learning process	Putra (2019); Yogyakarta (2015)

Philosophical Aspects	Meanings	Philosophical Explanation (Yogyakarta & Javanese Context)	Reference
6. Self-Awareness	Introspection, self-recognition	The Kawung motif is often interpreted as an "inner eye" or mirror. It encourages people to be aware of their position, goals, and life strategies	Haryono (2019); Sunaryo (2015)
7. Social Justice & Equality	All humans are equal in the cosmic order	The symmetrical pattern illustrates that all elements have equal value. Javanese principle: *"ajining diri ana ing lathi, ajining raga ana ing busana"*.	Susanto (1980); Yogyakarta (2015)
8. Order & Discipline	An orderly and directed life	The neat arrangement of the Kawung pattern reflects the value of *tata titi*: life must be lived with discipline, order, and consideration.	Haryono (2019); Soedarmo (2013)
9. Patience	A long process towards good results	Batik makers must repeat the pattern many times to produce a perfect Kawung motif → a symbol of patience in the process.	U.n.e.s.c.o (2009)
10. Social Interconnection	Humans are interconnected	Each Kawung ellipse does not stand alone; they all form a whole → a symbol of the importance of social relations and togetherness	Putra (2019); Sunaryo (2015)

Symbolic analysis shows that the Kawung motif contains six main philosophical values. These values can be directly mapped to the principles of the mathematical mindset, as shown in Table 2.

Table 2. Kawung Batik Philosophy and Mathematical Mindset Dimensions

Kawung Philosophical Aspect	Interpretive Meaning	Associated Mathematical Mindset Dimension (Saefudin et al., 2023)	Rationale for the Alignment
1. Purity & Simplicity	Represents inner clarity, sincerity, and modest living	Ability & Intelligence	The clean and uncomplicated structure of the Kawung motif symbolizes the idea that mathematical competence can evolve gradually when learners engage in continuous and meaningful learning experiences.

Kawung Philosophical Aspect	Interpretive Meaning	Associated Mathematical Mindset Dimension (Saefudin et al., 2023)	Rationale for the Alignment
2. Balance	Embodies harmony across the four spheres of life and personal equilibrium	Challenge	The symmetrical organization of Kawung teaches that challenges are inherent to achieving balance, helping learners view demanding mathematical tasks as part of a natural learning journey.
3. Perseverance & Cycles of Life	Signifies repeated movement through phases of struggle and growth	Obstacles / Difficulties	The recurring patterns in the motif represent life's cyclical nature, illustrating that setbacks and mistakes are stepping stones in the growth process, thereby strengthening students' capacity for productive struggle.
4. Self-Awareness & Discipline	Reflects introspection, self-regulation, and carefully considered actions	Effort	Producing a Kawung pattern requires focused, disciplined, and reflective effort. This mirrors the principle that meaningful academic effort involves strategy and evaluation, not mere repetition.
5. Inner Reflection (Symbolic Mirror)	Encourages mindful self-evaluation and continuous improvement	Criticism/Feedback	The reflective symbolism of Kawung fosters an attitude in which learners interpret feedback as guidance for development rather than as personal criticism.
6. Social Harmony & Interconnectedness	Highlights mutual respect, equality, and the interconnected	Success of Others	The interconnected oval shapes convey that individual achievements contribute to collective harmony, encouraging

Kawung Philosophical Aspect	Interpretive Meaning	Associated Mathematical Mindset Dimension (Saefudin et al., 2023)	Rationale for the Alignment
	nature of community life		learners to perceive others' success as motivation rather than competition.

The analysis illustrates that the Kawung motif embodies considerable cultural significance and operates as a powerful cognitive stimulus, acting as an emblem that engenders particular mental processes and dispositions congruent with educational aims.

Design Principles for the Kawung-Based Mindset Intervention

Four principles of intervention design were formulated through the processes of value mapping and a comprehensive analysis of relevant literature.

1. Symbolic Anchoring
   The Kawung philosophy functions as a narrative foundation, linking educational experiences to psychological values such as perseverance and the acceptance of errors.
2. Cultural Reflective Reasoning
   Learners are encouraged to reflect upon the Kawung philosophy and make connections to their personal experiences in overcoming mathematical challenges.
3. Organized Productive
   Challenge STEAM activities are meticulously arranged with progressively increasing levels of difficulty, presenting substantial challenges and associating them with the concept of perseverance as depicted in the Kawung motif.
4. Process-Oriented Feedback
   Educators provide feedback that emphasizes the developmental process rather than the final outcome, thereby aligning with the Kawung philosophy of equilibrium and the principles of a growth mindset.

Proposed Learning Scenarios for Kawung-STEAM Activities as Mindset Intervention

The pedagogical frameworks of STEAM learning scenarios are methodically designed to integrate the principles of Kawung values and mindset ideologies within interdisciplinary projects.

1. The Reconstruction and Geometry of Kawung (Mathematics and Art)
   Learners engage in a meticulous reconstruction of Kawung patterns through the application of circles, symmetry, and geometric transformations. This activity emphasizes the role of repetition as a crucial indicator of resilience.
2. Algorithmic Pattern Generation in Technology
   Scholars utilize geometric software, such as Geogebra or foundational Python, to develop an algorithm for the creation of Kawung motifs. This endeavor underscores the imperative nature of iterative refinement, which is vital for cultivating a growth-oriented mindset.
3. Investigation of Materials and Batik Technology (Engineering)
   Students undertake an exploration of batik materials, encompassing wax, dye, and fabric, while participating in small-scale experimental methodologies. The iterative process of trial and error is associated with a constructive interpretation of mistakes.
4. Interpretation of Cultural Meaning in Arts and Humanities
   Learners critically examine Kawung philosophy and contemplate the relationship between symbols and their encounters with challenges within the educational sphere. This segment underscores the importance of reflective learning.

We can also use Table 3 to link the philosophy of Batik Kawung, the mathematical mindset dimension and STEAM learning design.

Table 3. Connecting the philosophy of Kawung Batik with the dimensions of mathematical mindset and the design of STEAM education.

Philosophical Value of Kawung Batik	Mathematical Mindset Dimension	Targeted Mindset Development	Implications for STEAM Learning Design
Purity and Simplicity	Ability & Intelligence	Encouraging learners to believe that mathematical ability can grow through experience and reflection	• Guiding students to deconstruct Kawung into basic geometric forms • Demonstrating how simple structures evolve into more complex patterns
Balance and Equilibrium	Challenge	Cultivating a positive attitude toward challenging mathematical tasks	• Activities involving geometric symmetry: rotation, reflection, translation • Using technology tools (e.g., GeoGebra) to redesign balanced Kawung compositions

Philosophical Value of Kawung Batik	Mathematical Mindset Dimension	Targeted Mindset Development	Implications for STEAM Learning Design
Perseverance and Life Cycles	Obstacles/Difficulties	Normalizing errors and difficulties as constructive steps in the learning process	• Coding and algorithmic reconstruction of Kawung motifs involving iterative debugging • Experimenting with batik materials through repeated trials
Self-Awareness and Discipline	Effort	Fostering strategic, reflective, and persistent engagement in learning	• Maintaining reflective journals documenting decision-making in STEAM tasks • Encouraging evaluation and refinement of algorithms or pattern-making strategies
Inner Reflection	Criticism/Feedback	Developing openness to constructive feedback as part of self-improvement	• Peer review sessions where students critique each other's Kawung-based designs • Structured reflection on aesthetic and mathematical elements of their work
Social Harmony and Interconnectedness	Success of Others	Helping learners appreciate peers' success as a source of motivation and inspiration	• Collaborative STEAM projects to create group-based Kawung artworks • Discussions on how the interconnected design of Kawung symbolizes collective achievement

A Comprehensive Integrative Conceptual Model for Kawung-STEAM Activities as Mindset Intervention

Conceptually, the conceptual model can be presented in the following flow in Figure 2.

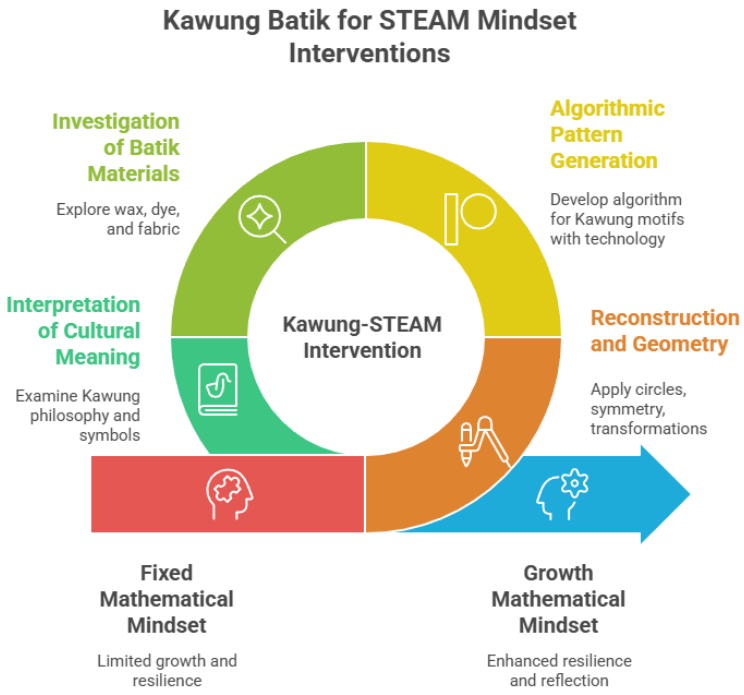

Figure 2. Framework of Mathematical Mindset Intervention in STEAM education context

The Figure 2 delineates a conceptual framework for intervention that integrates Kawung Batik within the realm of STEAM education. Equity-oriented integrated STEAM practices improve educational results for diverse students through inclusive and culturally relevant pedagogy (Roberts et al., 2024). Kawung-STEAM aims to change students' mindsets toward mathematics learning. Transdisciplinary STEAM curricular frameworks use art and design to encourage creative inquiry and problem-solving across disciplines (Costantino, 2018). Kawung Batik is a cognitive scaffold, similar to earlier research that uses cultural elements to engage and excite STEM underrepresented cohorts (Serrano Corkin et al., 2020). Research shows that project-based learning and creative cognitive activities in STEAM education boost students' creativity and self-efficacy, which are essential for developing a growth-oriented mindset (Gu & Wang, 2024). Research on collective mathematical comprehension supports the Kawung-STEAM framework's emphasis on experiential learning and resilience in the face of error (Martin & Towers, 2015). Framing Batik Kawung as an ethnomathematical artifact and aligning with schema theory, which emphasises knowledge formation and cognitive engagement, makes mathematics teaching more culturally relevant (Lee & Herner-Patnode, 2025). The Kawung-STEAM framework promotes a growth-oriented mathematical mindset through cultural, creative, and cognitive elements, adding to STEAM education discourse (Aguayo et al., 2023; Decorte & Vlieghe, 2024).

CONCLUSION

This study presents a theoretical framework for interventions aimed at enhancing mathematical mindsets by integrating the symbolic and philosophical significance of Kawung Batik within the context of culturally responsive STEAM education. The suggested paradigm amalgamates the core principles of the Kawung motif—balance, tenacity, harmony, self-awareness, and social interconnectedness—with the psychological conceptions of a mathematical mindset. These psychological aspects encompass beliefs regarding competence, attitudes towards difficulties, responses to errors, evaluations of effort, receptiveness to feedback, and interpretations of peers' accomplishment. The suggested methodology enables these links via four unique STEAM learning scenarios: geometric reconstruction, computational pattern development, material investigation in batik-making, and cultural interpretation. The exercises aim to stimulate thought and emotion, promote constructive challenges, foster reflective practices, and assist individuals in self-discovery. This model redefines cultural symbolism as a cognitive framework that shapes learners' epistemic beliefs and dispositional responses to mathematics, rather than perceiving it merely as decorative content. This research advances the discussion on culturally situated mindset interventions by introducing an innovative method for modifying learners' mathematical proclivities in contexts where cultural identity profoundly impacts cognitive processes. Future study must empirically validate this conceptual framework through classroom implementations, design-based research, or experimental studies to evaluate its effects on psychological and academic outcomes.

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