**Harnessing Generative AI in Art Education: A Qualitative Case Study on Leonardo AI and Student Creativity**

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## ABSTRACT

This qualitative case study examines the impact of Leonardo AI, a generative artificial intelligence platform, on student creativity, imagination, and engagement in a Malaysian primary art classroom. Conducted with 25 Year 5 students, the research employed classroom observations, student-generated artworks, semi-structured interviews, and guided reflections to explore how AI-supported tools can enhance visual expression. Findings reveal that Leonardo AI served as a creative scaffold, enabling students to visualise abstract and fantastical ideas beyond their manual drawing skills. The tool fostered increased creative confidence and intrinsic motivation, particularly among learners with limited technical proficiency. However, challenges arose, including an overemphasis on visual aesthetics and uncertainties regarding authorship and originality. These issues highlight the need for ethical guidance and critical digital literacy when incorporating AI into the art curriculum. The study concludes that while Leonardo AI holds significant promise as an educational ally, its integration must be thoughtfully designed to balance creativity, authenticity, and ethical responsibility. Practical implications are offered for art educators and curriculum developers seeking to implement AI meaningfully in visual arts education.

**Keywords**: generative AI, visual arts education, student creativity, Leonardo AI, ethical integration

**INTRODUCTION**

The swift progression of generative artificial intelligence (AI) has generated novel opportunities and problems in education, especially in disciplines often linked to human intuition, such as visual arts. Instruments like DALL·E, MidJourney, and Leonardo AI empower users to generate intricate digital graphics from basic text prompts, prompting inquiries around authorship, creativity, and artistic development. These technologies are progressively investigated in higher education and professional creative sectors; however, their utilization in primary school art classes is nonetheless constrained and inadequately studied. The Seni Visual curriculum in Malaysia continues to emphasize manual drawing abilities, craftsmanship, and technical expertise (Kamarudin et al., 2021). Despite national initiatives like the Malaysia Education Blueprint (2013–2025) and the Digital Education Policy (2021–2025) prioritizing digital innovation and the incorporation of IR4.0 technologies, actual classroom practices demonstrate a sluggish acceptance rate. Educators frequently lack pedagogical frameworks for integrating AI, whereas students, especially from impoverished groups, experience digital tools in a disjointed manner (Ramli et al., 2022). This circumstance has resulted in a disparity between policy objectives and the actual digital learning experiences of students in art education.

Current global research on AI in education primarily focuses on language acquisition (Tan et al., 2023), individualized tutoring (Shneiderman, 2020), or higher education settings (Hammond et al., 2022). Nevertheless, limited research examines the function of AI as a co-creative collaborator for children, particularly in primary school art education. Fundamental concerns including authorship, originality, ethical ownership, and hybrid art-making methods are insufficiently examined in early schooling. Moreover, there exists a paucity of literature from Southeast Asia that examines how cultural narratives and local curricula influence the incorporation of generative AI in art education. This research aims to fill these gaps by examining the application of Leonardo AI in a Year 5 art school in Malaysia. This study specifically investigates the impact of generative AI on student creativity, imagination, and engagement, while also addressing the pedagogical problems that emerge during this process. This research is innovative in three aspects. Initially, it offers one of the initial empirical explorations of Leonardo AI inside primary school settings. Secondly, it highlights the ethical and authorship challenges encountered by youngsters in the realm of AI-assisted creativity. Third, it provides a Southeast Asian viewpoint to the global dialogue on AI and education, emphasizing the interaction of culture, curriculum, and technology. This study presents insights into the developing interaction between technology, creativity, and pedagogy by placing AI as both a tool and a co-agent in learning. The primary problem for educators is not the integration of AI into art education, but rather the creation of learning experiences that enhance, rather than undermine, students' creative agency.

**LITERATURE REVIEW**

The integration of artificial intelligence (AI) in education has garnered increasing scholarly interest, particularly about its potential to transform creativity, authorship, and pedagogy. This emphasises three areas identified in the literature: (1) theories of creativity and learning, (2) the role of generative AI in education, and (3) ethical and cultural implications for art education. Creativity has conventionally been regarded as both an individual and socially influenced pursuit. Vygotsky’s sociocultural theory (1978) underscores the significance of cultural instruments in enhancing learners’ cognitive abilities. In this perspective, AI operates as a framework akin to conventional artistic instruments, enhancing learners' ability to conceive and depict concepts (Tan et al., 2023). Constructivist strategies emphasise the significance of active participation and meaning-making in learning (Creswell & Poth, 2017), presenting students as co-creators of knowledge instead of passive users. Recent studies suggest that generative AI may function as a "cognitive amplifier," allowing learners with less technical proficiency to externalise intricate or abstract concepts (Davis, 2023). Posthumanist educational studies contest anthropocentric concepts of creativity, surpassing human-centered viewpoints. Bayne (2018) and Knox (2020) contend that creativity arises from the interaction of humans, technologies, and material surroundings. From this perspective, generative AI is not a neutral tool but a semi-autonomous collaborator that influences aesthetics, agency, and significance. This viewpoint is particularly pertinent in educational settings where the distinction between student expression and machine-generated content becomes indistinct.

**Generative AI in Education**

Research on artificial intelligence in education has escalated over the past decade, however a substantial amount remains focused on higher education and STEM fields. Shneiderman (2020) outlines principles for secure and dependable AI, whereas Hammond et al. (2022) examine its implementation in collaborative learning environments. Studies on creativity and design demonstrate that generative AI enhances ideation, prototyping, and artistic expression (Nake & Klein, 2020; Loveless, 2022). Nonetheless, research in primary education remains constrained. Derryberry and Armstrong (2020) highlighted AI's potential to augment creativity in K–12 classrooms; nevertheless, empirical case studies in creative settings, particularly in Southeast Asia, are limited. Recent studies highlight the need of AI literacy. Ng et al. (2023) assert that ethical awareness, critical reflection, and responsible digital citizenship are essential for the integration of AI into educational curricula. Without specific guidance, students may become overly dependent on AI-generated content, endangering their deep engagement with creativity (Mills & Ortega, 2022).

The incorporation of Generative AI (GAI) in educational settings yields significant improvements, including tailored learning, heightened student engagement, and enhanced academic performance. Nevertheless, distinct challenges and constraints impede the smooth integration of this technology, especially concerning ethics, accessibility, and customisation. The ethical ramifications of employing GAI in education are intricate. Concerns regarding data privacy and security stem from the management of extensive sensitive student information, increasing the likelihood of unauthorised access and misuse (Gunawan & Wiputra, 2024; Gallent et al., 2023). Algorithmic bias is a critical concern, as GAI systems may reinforce biases inherent in training datasets, resulting in skewed outcomes and unequal educational opportunities (Gunawan & Wiputra, 2024; Gabriel, 2024). Moreover, academic integrity is jeopardised, as GAI technology may be misused for unethical behaviours such as plagiarism or impersonation of authorship, hence threatening ethical academic norms (Chang et al., 2023). The digital divide is a significant concern, as unequal access to technology and internet connectivity may intensify existing disparities among pupils, especially in resource-constrained environments (Ng et al., 2025). Moreover, GAI necessitates significant technical infrastructure, which may be lacking in many educational institutions, hence constraining its potential for widespread implementation. Educators and students require sufficient training and support to effectively utilise GAI tools, necessitating significant investment in professional development and continuous technical assistance (Bougdira & Al Murshidi, 2025). While GAI can deliver highly tailored educational experiences, the problem lies in scaling these solutions to serve a broad and diverse student body. The precision and dependability of AI-generated content is a significant concern, as inaccuracies or misleading information may adversely affect students' academic performance. A precise equilibrium must be upheld between AI-driven personalisation and human connection, guaranteeing that AI augments rather than supplants educators. This equilibrium is vital for promoting critical thinking and social-emotional development, which are crucial elements of the educational process (Guettala et al., 2024).

The use of generative AI into art instruction introduces certain ethical and cultural challenges. The challenges of authorship and originality are particularly evident when youngsters employ AI to produce visual art (Selwyn, 2019). It is found there is a need in incorporating ethical frameworks and digital literacy into educational practices to ensure that technology promotes equity and inclusivity rather than exacerbating inequities. The Seni Visual curriculum in Malaysia mostly emphasises manual sketching and traditional techniques (Kamarudin et al., 2021), hence limiting opportunities for testing with AI tools. Cultural narratives and folklore are essential to creative identity, offering a substantial basis for hybrid enquiries that allow students to merge traditional tales with digital innovation. Research suggests that this integration could democratise participation by enabling learners with limited technical skills to partake in creative expression (Ramli et al., 2022; Chong & Lee, 2021). The literature highlights the opportunities and obstacles of AI integration in education. Generative AI amplifies creative capacity while raising concerns with ethical ownership, superficial aesthetics, and cultural authenticity. The deficiency of empirical research in elementary art institutions, particularly in Southeast Asia, highlights the imperative for this study.

**Art Education and Technology**

The application of technology and AI in art education is supported by many theoretical frameworks designed to augment creativity and educational results. A notable framework is the AI Dual-Teacher Classroom, which employs technologies such as knowledge graphs and teaching robots to enhance creativity and critical thinking via human-AI collaboration (Wang et al., 2024). Another significant concept is STEAM Education with AI, which integrates AI-driven tools like as Motion Capture (AI-MoCap) to connect art and STEM fields, fostering creative task designs and creativity in virtual learning settings (Cahyono et al., 2025). Furthermore, Generative AI in Art Education examines the ways in which AI tools might aid non-art majors in artistic creation, enhancing both creative productivity and aesthetic quality. The AI and Higher-Order Thinking framework highlights the capacity of AI technologies to facilitate critical thinking and problem-solving via personalized learning pathways and interactive methodologies, whereas AI in Visual Communication Design aims to improve instructional strategies and assessment techniques in design education (You, 2024).

Regardless these gains, considerable research deficiencies persist in the domain. There is a necessity for additional investigation into the long-term effects of AI on art education, specifically regarding its alignment with overarching educational objectives (Christou, 2024). Furthermore, there is a deficiency in empirical evidence concerning the efficacy of AI technologies in K-12 art instruction, as their practical implementation and results remain inadequately examined (Su & Mokmin, 2025). Ethical concerns, including data privacy and content bias, provide challenges that require strong ethical frameworks for the implementation of AI in education. Inadequate teacher training and budget constraints hinder the effective integration of AI in educational environments, as educators often lack the necessary skills and tools to efficiently employ AI systems. Investigating student perspectives and acceptance of AI in creativity is essential, as varying levels of understanding of AI affect their willingness to interact with these technologies (Marrone, 2022). Addressing these limitations is crucial for realizing the full potential of AI in fostering creativity and improving educational practices.

**METHODOLOGY**

This research utilized a qualitative case study methodology to examine the influence of generative AI, particularly Leonardo AI, on creativity, authorship, and cultural expression among primary school kids in Malaysia. A case study methodology was used to facilitate a comprehensive examination of the lived experiences of students and their instructor within a defined classroom context. In accordance with Yin (2018) and Merriam and Tisdell (2016), the case was characterized as an individual art classroom where AI was intentionally incorporated into the educational process. This design was specifically tailored to capture the intricate interplay of technological, cultural, and pedagogical aspects that arose during the lessons.

The research was situated in a government-supported primary school in Johor, Malaysia. The school was selected purposively as it represented the increasingly digitalised yet culturally diverse nature of Malaysian classrooms. The context is significant because the *Malaysia Education Blueprint (2013–2025)* and the *Digital Education Policy (2021–2025)* both call for innovative uses of technology that also respect local identity and cultural heritage. By situating the research within this environment, the study was able to shed light on how global technological shifts are negotiated within local educational realities.

The participants comprised twenty-eight students aged ten to eleven years, alongside their art teacher, who had more than a decade of teaching experience. The students represented multiple cultural backgrounds, reflecting Malaysia’s pluralistic society. This diversity was important as it allowed the research to observe how different cultural perspectives influenced the integration of AI in art-making. Sampling was purposive: the class was already engaging with digital applications, making it an information-rich site for exploring the research questions. Ethical protocols were followed, with informed consent obtained from parents and assent from students. The teacher’s involvement was central, not only as a mediator of the learning process but also as a co-reflector on the classroom dynamics.

The data collection period lasted eight weeks and utilized four supplementary sources. Initially, comprehensive field notes were documented during each session, encompassing classroom interactions, teacher directives, and peer collaboration. The notes comprised descriptive observations and thoughtful comments. Secondly, students produced written reflections at the conclusion of sessions, providing insights into their cognitive processes, creative choices, and emotional reactions to AI integration. Third, semi-structured interviews were performed with the educator and a selected group of ten pupils. Each interview spanned 30 to 45 minutes, during which questions explored their ideas of creativity, authorship, and cultural expression in relation to AI usage. Ultimately, visual artifacts were gathered, comprising AI-generated images and student-altered artworks that integrated digital and manual methods. Collectively, these many data sources provide a comprehensive perspective on classroom methods and student experiences.

Data analysis followed Braun and Clarke’s (2006, 2021) six-step thematic analysis framework. The process began with repeated reading of field notes, reflections, interview transcripts, and artefacts to gain familiarity with the dataset. Initial coding was conducted inductively, while also informed by Torrance’s (1974) creativity framework, which emphasises fluency, flexibility, originality, and elaboration. Codes were compared across different sources to identify patterns and divergences. Through iterative cycles of coding and refinement, five major themes were developed: empowerment through visualisation, aesthetic overdependence, teacher mediation, hybrid art-making, and authorship dilemmas. These themes were then examined in relation to existing literature, sociocultural theories of learning, and Malaysian policy frameworks.

Several strategies were employed to ensure trustworthiness. Triangulation across multiple data sources enhanced credibility by confirming patterns through different forms of evidence. Member checking with the teacher helped validate interpretations, while peer debriefing with fellow researchers allowed critical review of coding and thematic construction. Thick description was used to provide readers with sufficient contextual detail to assess transferability. Ethical considerations were carefully observed: student identities were anonymised, pseudonyms were used in reporting, and participation was voluntary. Working with minors required additional safeguards, including parental consent and sensitivity in classroom interactions to ensure that learning was not disrupted.

In sum, the methodological approach was designed to balance rigour with sensitivity to context. By combining multiple sources of evidence, iterative thematic analysis, and ethical safeguards, the study produced a nuanced account of how AI intersects with creativity, culture, and ethics in a Malaysian primary classroom.

**RESULTS**

The outcomes of this study are presented in five thematic dimensions: empowerment through visualisation, aesthetic overdependence, teacher mediation and scaffolding, hybrid art-making, and authorship dilemmas. Each theme is grounded in triangulated evidence and is interpreted in relation to past research, Malaysian policy directions, and the wider discourse on creativity and generative AI in education.

**Theme 1: Empowerment through Visualisation – AI as a Cognitive Equaliser**

The first theme identified was the empowerment of students through visualisation. This theme contained **three sub-dimensions**: (a) reduction of technical barriers, (b) expansion of imaginative scope, and (c) increased participation and confidence.

**(a) Reduction of Technical Barriers**

AI mitigated the drawing-related challenges that often discourage primary students. Many learners previously struggled with proportion, perspective, and detail—skills heavily emphasised in the *KSSR Seni Visual* curriculum (Kamarudin et al., 2021). By translating text prompts into polished visuals, Leonardo AI bypassed these hurdles and allowed students to express ideas regardless of their manual skill.

This directly supports Malaysia’s Digital Education Policy (2021–2025), which seeks to democratise access to digital tools in classrooms. Where traditional art instruction privileges students with stronger fine-motor skills, AI provided a more level platform for participation.

**(b) Expansion of Imaginative Scope**

AI expanded students’ imaginative range by enabling them to visualise fantastical ideas such as “dragons flying over neon cities” or “future eco-villages.” These imaginative leaps reflect Torrance’s (1974) notion of creativity as the capacity for divergent thinking. AI acted as a cognitive amplifier (Tan et al., 2023), generating images beyond the limits of manual skill.

In the Malaysian classroom context, such imaginative freedom represents a shift from the traditional emphasis on replication and neatness, towards innovation and ideation.

**(c) Increased Participation and Confidence**

Classroom observations recorded greater enthusiasm among previously hesitant learners. Students who once refrained from showing their work due to lack of confidence were now more willing to share their AI outputs. This sense of validation aligns with Vygotsky’s (1978) principle of social mediation: once learners felt their ideas were “good enough,” they became more active in classroom discourse.

The teacher also reported that participation broadened across ability levels, confirming that AI served as a social equaliser. This reflects the Malaysia Education Blueprint (2013–2025) goal of ensuring inclusion and reducing disparities in student engagement.

**Table 1. Sub-Dimensions of Empowerment**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sub-Criterion** | **Evidence from Data Sources** | **Theoretical / Policy Link** | **Interpretation** |
| Reduction of technical barriers | AI outputs bypassed drawing difficulties; weaker students able to produce polished visuals | KSSR emphasises manual skills; Digital Education Policy promotes access | AI lowered entry barriers, levelling classroom participation |
| Expansion of imaginative scope | Prompts visualised fantastical ideas; artefacts scored high in imagination | Torrance (1974) divergent thinking; Tan et al. (2023) AI as cognitive amplifier | AI expanded the range of creative expression beyond manual limits |
| Increased participation & confidence | Observations showed shy learners becoming active; artefacts shared more openly | Vygotsky (1978) scaffolding; Malaysia Education Blueprint inclusivity goals | AI functioned as a social equaliser, boosting student confidence |

Leonardo AI empowered students by democratising artistic expression. By removing technical barriers, it enabled broader participation and heightened confidence, particularly among less skilled students. By expanding imaginative possibilities, it shifted the emphasis of art-making from technical perfection to conceptual ideation. In the Malaysian context, this represents a significant step towards aligning classroom practices with national policy directives for inclusive and future-oriented education.

**Theme 2: Aesthetic Overdependence – Beauty Without Depth**

While Leonardo AI expanded access and imagination, analysis revealed a second major theme: students’ tendency to overvalue surface-level aesthetics at the expense of deeper conceptual development. This theme manifested in three sub-dimensions: (a) fixation on realism and polish, (b) reduced manual engagement, and (c) shallow conceptual depth.

**(a) Fixation on Realism and Polish**

Students often equated the “success” of their artwork with how realistic or polished the AI output appeared. Classroom observations documented students comparing outputs using terms like “nicer,” “cooler,” and “more real.” When AI outputs did not meet these expectations, some learners disengaged entirely.

This reflects Mills & Ortega’s (2022) caution that generative AI can encourage “aesthetic mimicry,” where learners imitate surface qualities rather than pursuing original meaning. In the Malaysian context, this tendency is reinforced by assessment practices that traditionally reward neatness and technical precision (Ramli et al., 2022).

**(b) Reduced Manual Engagement**

The overreliance on AI visuals often led students to minimise their manual contributions. Instead of integrating AI images into larger artworks, some simply traced outlines or copied colours. Artefact analysis confirmed this, with several works showing minimal elaboration despite high imaginative prompts.

This pattern runs counter to the intentions of the *KSSR Seni Visual* curriculum, which emphasises the cultivation of fine motor skills and craftsmanship (Kamarudin et al., 2021). Without careful guidance, the use of AI risks eroding the manual dimension of art-making that remains vital for holistic creative development.

**(c) Shallow Conceptual Depth**

While AI inspired imaginative ideas, many works remained visually striking but conceptually underdeveloped. Reflections often focused on appearance (“it looks real,” “I like the colours”) rather than narrative or meaning. This reveals a gap between visualisation and conceptualisation: students could generate spectacular images but struggled to extend them into meaningful stories or critical themes.

This finding resonates with Eisner’s (2002) concern that art education should cultivate not only skill and aesthetics but also critical interpretation and expression. For Malaysian classrooms, this highlights the need to embed critical digital literacy alongside AI use, ensuring that technology does not narrow creativity to spectacle alone.

**Table 2. Sub-Dimensions of Aesthetic Overdependence**

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| --- | --- | --- | --- |
| **Sub-Criterion** | **Evidence from Data Sources** | **Theoretical / Policy Link** | **Interpretation** |
| Fixation on realism & polish | Observations of students comparing outputs by “realism” and “beauty” | Mills & Ortega (2022) aesthetic mimicry; Ramli et al. (2022) Malaysian exam culture | AI outputs reinforced emphasis on polish over creativity |
| Reduced manual engagement | Artefacts traced or coloured over with little elaboration | KSSR Seni Visual stresses craftsmanship | Risk of neglecting manual skills and holistic creative development |
| Shallow conceptual depth | Reflections focused on colours/realism rather than stories | Eisner (2002) art as meaning-making | Students admired aesthetics but failed to construct deeper narratives |

Leonardo AI presented a paradox: it democratized access to imaginative visualization while simultaneously cultivating aesthetic reliance. The appeal of refined images distracted from narrative complexity, craftsmanship, and critical interpretation. In the Malaysian context, this susceptibility is particularly salient since it corresponds with enduring cultural norms that prioritize neatness and precision in student output. In the absence of intentional educational strategies, generative AI may exacerbate superficial involvement and compromise the curriculum's objectives of promoting creativity and profound expression.

**Theme 3: Teacher Mediation and Scaffolding – Guiding Ownership and Meaning**

The third theme revealed the indispensable role of teacher mediation in transforming AI from a source of polished images into a springboard for student-led creativity. This theme contained three sub-dimensions: (a) redirecting from product to process, (b) embedding cultural and contextual meaning, and (c) scaffolding ethical reflection.

**(a) Redirecting from Product to Process**

In the absence of guidance, numerous students regarded AI outputs as completed works. Teacher intervention transitioned emphasis from passive consumption to active contemplation. By posing incisive questions like “What narrative does this image convey?” learners were encouraged to engage in critical thinking regarding narrative and aim.   
This transition reflects Vygotsky’s (1978) notion of scaffolding, wherein advanced cognitive processes are attained via social mediation. In the Malaysian context, it underscores the need of instructors not merely as technology facilitators but as narrative architects who inspire students to transcend visual appreciation and engage in meaning-making.

**(b) Embedding Cultural and Contextual Meaning**

Teacher mediation also encouraged students to localise AI imagery with cultural references, such as adding kampung houses, batik patterns, or folklore elements. These additions re-anchored the global aesthetic of AI within Malaysian cultural identity.

This finding is significant in light of Malaysia’s *Education Blueprint (2013–2025)*, which emphasises cultural identity in the midst of globalisation. It also resonates with Chong & Lee (2021), who argue that digital art education should remain rooted in local narratives to avoid cultural homogenisation.

**(c) Scaffolding Ethical Reflection**

Perhaps most uniquely, mediation also extended into ethical domains. By prompting learners to question authorship and originality, the teacher scaffolded discussions about ownership. Students began to reframe AI not as the sole author but as a collaborator, embedding personal meaning through manual additions.

This aligns with UNESCO’s (2021) call for embedding AI ethics into school curricula, but it is noteworthy here that such reflection was successfully facilitated even in a primary classroom.

**Table 3. Sub-Dimensions of Teacher Mediation**

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| --- | --- | --- | --- |
| **Sub-Criterion** | **Evidence from Data Sources** | **Theoretical / Policy Link** | **Interpretation** |
| Redirecting product → process | Students guided to tell stories and explain choices | Vygotsky (1978) scaffolding | Teacher shifted focus from polished AI product to reflective process |
| Embedding cultural/contextual meaning | Students encouraged to add kampung houses, folklore, batik motifs | Malaysia Education Blueprint (2013–2025); Chong & Lee (2021) | Teacher anchored AI art in Malaysian cultural identity |
| Scaffolding ethical reflection | Students questioned ownership, reframed AI as collaborator | UNESCO (2021) AI ethics; Selwyn (2019) | Teacher facilitated early ethical literacy in creativity |

The results affirm that teacher mediation was essential for maintaining the instructional significance of AI usage. Mediation shifted students' perception of AI from a definitive product to a foundational resource for their own creativity. It facilitated the incorporation of cultural identity and ethical consciousness, guaranteeing that creativity was both broadened and contextualized in a responsible manner.   
This position directly corresponds with contemporary Malaysian policy objectives, which conceptualize educators as "digital pedagogues" adept at harmonizing technology advancements with cultural and ethical principles. It also contributes globally by illustrating how primary-level learners, with facilitation, can participate in complex conversations of authorship and cultural identity—domains frequently regarded as too abstract for this age group.

**Theme 4: Hybrid Art-Making – Negotiating Digital, Manual, and Cultural Aesthetics**

The fourth theme revealed that students did not treat AI-generated outputs as fixed artefacts. Instead, they actively merged digital and manual modes of expression, producing hybrid artworks that embodied both technological aesthetics and local cultural identity. This theme unfolded across three sub-dimensions: (a) material hybridity, (b) cultural hybridity, and (c) collaborative hybridity.

**(a) Material Hybridity**

Students frequently combined AI-generated images with traditional media such as acrylic paints, coloured pencils, and collage techniques. For example, AI-generated caves became backgrounds for glowing fireflies painted in acrylic, while printed images were cut, layered, and repurposed into murals.

This practice demonstrates that AI was not passively consumed but rather appropriated as material within broader artistic processes. It echoes posthumanist views of creativity (Bayne, 2018), which highlight how human and non-human agencies co-produce artistic meaning.

**(b) Cultural Hybridity**

A unique contribution of this study was the embedding of Malaysian cultural motifs into AI-generated imagery. Students incorporated kampung houses, folklore characters, and batik patterns into their works, effectively “localising” AI art.

This outcome reflects the *Malaysia Education Blueprint (2013–2025)* commitment to balancing global competencies with cultural identity. It also aligns with research by Chong & Lee (2021), who argue that AI-enabled creativity should not displace but rather enrich cultural narratives. Here, students demonstrated the potential of AI as a platform for cultural negotiation, fusing modern technology with heritage traditions.

**(c) Collaborative Hybridity**

Hybrid practices extended beyond materials and culture into collaboration. Several group projects involved integrating individual AI outputs into collective murals, where students negotiated how digital elements could be combined with shared manual additions.

This finding illustrates what Cahyono et al. (2025) describe in STEAM learning as “collaborative hybridity,” where creativity is distributed not only across human and non-human actors but also across peers in a social process. In the Malaysian classroom, this collective hybridity took on a community-oriented character, reflecting values of *gotong-royong* in art-making.

**Table 4. Sub-Dimensions of Hybrid Art-Making**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sub-Criterion** | **Evidence from Artefacts & Observations** | **Theoretical / Policy Link** | **Interpretation** |
| Material hybridity | AI caves overlaid with acrylic fireflies; collage of printed AI images | Bayne (2018) posthumanist creativity | Students treated AI as material to be manipulated, not final product |
| Cultural hybridity | Addition of kampung houses, folklore figures, batik motifs to AI outputs | Malaysia Education Blueprint (2013–2025); Chong & Lee (2021) | AI art localised, protecting and extending Malaysian identity |
| Collaborative hybridity | Group murals merging AI elements with collective painting | Cahyono et al. (2025) STEAM collaboration; Malaysian *gotong-royong* values | Distributed creativity extended to social, communal processes |

Hybrid art-making in this classroom illustrates a multi-layered negotiation of creativity. On a material level, AI outputs became canvases for manual elaboration. On a cultural level, global aesthetics were fused with Malaysian identity markers. On a collaborative level, artworks reflected collective negotiation and community spirit.

This finding is significant both locally and internationally. Locally, it shows that AI can be integrated into art education in ways that sustain and even strengthen Malaysian cultural narratives. Internationally, it contributes to the debate on posthumanist creativity by showing that hybridity is not limited to human–machine relations, but also encompasses cultural and communal dimensions.

**Theme 5: Authorship Dilemmas – Negotiating Ownership and Originality**

The fifth theme captured students’ struggle with questions of authorship and originality when working with AI-generated outputs. Unlike conventional art-making, where authorship is assumed to reside with the creator, the involvement of Leonardo AI prompted uncertainty and ethical reflection. This theme developed through three sub-dimensions: (a) uncertainty of ownership, (b) reframing authorship as co-agency, and (c) emergence of early ethical literacy.

**(a) Uncertainty of Ownership**

Students frequently questioned whether their works could be considered “their own” when the initial images were generated by AI. This dilemma was visible in classroom discussions and reflections, where learners expressed doubt about who should be credited for the artwork.

This finding aligns with Selwyn (2019), who argues that AI disrupts traditional notions of originality and authorship. What is significant here, however, is that such concerns emerged among primary school learners, a group often assumed to be less engaged with abstract ethical issues.

**(b) Reframing Authorship as Co-Agency**

Some students moved beyond uncertainty by reframing the creative process as a form of collaboration with AI. They described AI as a “partner” that generated base imagery, which they then personalised through manual and narrative additions.

This reframing resonates with posthumanist theories (Knox, 2020; Bayne, 2018), which view creativity as distributed across assemblages of human and non-human agents. In the Malaysian classroom, co-agency was often expressed through the embedding of cultural motifs or values into AI images, thereby reclaiming ownership through personalisation.

**(c) Emergence of Early Ethical Literacy**

Perhaps the most significant sub-dimension was the evidence of ethical literacy emerging at primary level. Students were not only able to articulate concerns about ownership but also demonstrated reflective strategies to resolve them. For instance, they justified authorship by highlighting their manual contributions (e.g., painting, collage, cultural adaptation).

This finding underlines UNESCO’s (2021) call for AI ethics to be embedded early in education and demonstrates its feasibility in Malaysian classrooms. It also extends current research by showing that ethical reflection on authorship can be meaningfully nurtured among young learners, provided there is teacher scaffolding and dialogic support.

**Table 5. Sub-Dimensions of Authorship Dilemmas**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sub-Criterion** | **Evidence from Data Sources** | **Theoretical / Policy Link** | **Interpretation** |
| Uncertainty of ownership | Students expressed doubt whether AI-made outputs were “theirs” | Selwyn (2019) AI and authorship | AI disrupted traditional notions of originality, even for children |
| Reframing as co-agency | Students viewed AI as a partner while embedding manual elements | Bayne (2018); Knox (2020) posthumanism | Authorship reframed as human–AI collaboration |
| Early ethical literacy | Learners defended ownership by emphasising personal contributions | UNESCO (2021) AI literacy in schools | Primary students demonstrated readiness for ethical reflection |

The theme of authorship dilemmas reveals that even young learners grapple with the ethical complexities of AI creativity. Initially, many were unsure whether their AI-assisted artworks “belonged” to them. Yet through reflective dialogue and manual elaboration, they reframed the process as one of co-agency, where authorship was shared but still meaningful.

This outcome is notable in three ways:

1. It challenges assumptions that ethical discourse around AI is only relevant in higher education.
2. It demonstrates that primary students are capable of reflective negotiation of originality, provided scaffolding is present.
3. It aligns with both global (UNESCO, 2021) and national (Digital Education Policy 2021–2025) directives that call for embedding AI ethics and responsible digital citizenship early in schooling.

The five themes which are empowerment, aesthetic overdependence, teacher mediation, hybrid art-making, and authorship dilemmas collectively illustrate a complex depiction of AI integration in a Malaysian primary art classroom.

* AI acted as an equaliser, reducing technical barriers and democratising participation.
* Children were vulnerable to aesthetic dependency, valuing polish over depth.
* Teachers mediated creativity and ethics, guiding students to embed cultural meaning and reclaim authorship.
* Hybrid practices flourished, combining digital, manual, and cultural elements.
* Ethical awareness emerged at an early stage, with learners reframing authorship as co-agency.

These results highlight both opportunities and challenges. They suggest that Leonardo AI can enrich creativity in primary classrooms, but only if embedded within pedagogical frameworks that balance empowerment, critical literacy, cultural identity, and ethical reflection.

**DISCUSSION**

The findings of this study highlight both the promise and the paradox of integrating generative AI into primary art education. On one hand, Leonardo AI empowered learners by democratising creative participation, amplifying imagination, and fostering new forms of hybridity. On the other, it also exposed vulnerabilities, such as aesthetic overdependence and uncertainty about authorship. This duality reflects what scholars such as Selwyn (2019) and McCormack et al. (2022) caution: that educational technologies are never neutral but always reshape learning in ways that are enabling and constraining.

These results carry particular significance in the Malaysian context, where national policies such as the Malaysia Education Blueprint and the Digital Education Policy call for both innovation and cultural preservation. By analysing classroom interactions, student artefacts, and reflections, the present study contributes a nuanced understanding of how AI can function not only as a cognitive amplifier but also as a cultural and ethical provocation.

What emerges is a need to situate AI art-making within a pedagogy that balances empowerment with criticality, and global innovation with local identity. The following discussion examines each of the five themes—empowerment, aesthetic overdependence, teacher mediation, hybrid art-making, and authorship dilemmas—linking them to existing literature, theoretical perspectives, and policy frameworks to highlight the unique contributions of this study.

**Theme 1: Empowerment through Visualisation – Democratizing Creativity**

The study revealed that Leonardo AI empowered students by lowering technical barriers, broadening imaginative possibilities, and boosting participation. This echoes Tan et al. (2023), who describe AI as a “cognitive amplifier,” but the present findings extend this notion to the primary classroom, where empowerment functioned not only as amplification but also as an equaliser of access.

In the Malaysian context, this outcome directly resonates with the Malaysia Education Blueprint and the Digital Education Policy, both of which emphasise equity and inclusion. By enabling learners with weaker drawing skills to participate meaningfully in art-making, AI responded to long-standing disparities in creative education where technical ability often overshadowed conceptual expression.

Unique Contribution: Unlike previous studies that focus on AI in higher education or design fields (McCormack et al., 2022), this study demonstrates how AI can empower young learners in ways that foster confidence and imagination, suggesting that democratizing creativity should be recognised as a pedagogical priority.

**Theme 2: Aesthetic Overdependence – Surface Beauty and Shallow Depth**

At the same time, empowerment was accompanied by aesthetic overdependence. Students equated polished AI visuals with creativity, echoing Mills & Ortega’s (2022) concern that generative AI risks reducing creativity to mimicry.

In Malaysia, this finding must be understood against a backdrop of assessment culture, where neatness and accuracy are often privileged (Ramli et al., 2022). AI reinforced this cultural tendency by providing “perfect-looking” images, which learners celebrated at the expense of narrative depth.

This outcome also challenges Eisner’s (2002) long-standing call for art education to cultivate meaning-making rather than technical display. Here, the AI tool inadvertently entrenched surface-level thinking.

Unique Contribution: This study extends the discourse on “AI as mimicry” to the primary level, highlighting a child-specific vulnerability: younger learners are especially prone to conflating beauty with creativity. This signals an urgent need for critical digital literacy to be embedded early in the curriculum, not only in higher education.

**Theme 3: Teacher Mediation and Scaffolding – Shaping Process, Culture, and Ethics**

The results affirmed that teacher mediation is indispensable. Without scaffolding, AI remained a static product; with guidance, it became a site for reflection, cultural embedding, and ethical dialogue.

This finding supports Vygotsky’s (1978) sociocultural theory, which positions teachers as mediators of higher-order meaning. It also reflects the Digital Education Policy, which describes teachers as “digital pedagogues” who must balance innovation with responsibility.

Beyond affirming existing literature, the study extends the discourse by showing that mediation was not limited to guiding technique but encompassed:

1. Narrative scaffolding (redirecting from product to process),
2. Cultural embedding (localising global aesthetics through kampung, folklore, and batik), and
3. Ethical guidance (framing authorship as co-agency).

Unique Contribution: Few international studies have documented the multi-layered mediation role of teachers in AI art-making. This study shows that, in Malaysian classrooms, teachers not only safeguard meaning but also become cultural custodians and ethical facilitators.

**Theme 4: Hybrid Art-Making – Fusing the Global and the Local**

A distinctive contribution of this study is the emergence of hybrid art-making, where AI outputs were blended with manual techniques and cultural motifs. This outcome resonates with posthumanist perspectives (Bayne, 2018), but extends them by demonstrating that hybridity in a Malaysian classroom encompassed not only human–machine assemblages but also cultural and communal assemblages.

* Material hybridity highlighted AI as a manipulable medium, not a final product.
* Cultural hybridity demonstrated resilience of Malaysian identity in the face of globalised aesthetics.
* Collaborative hybridity reflected *gotong-royong* values, extending hybridity into social dimensions of creativity.

This outcome is particularly relevant to national goals. The Malaysia Education Blueprint and Ministry of Tourism, Arts and Culture both stress the preservation of cultural heritage within globalisation. Students’ incorporation of folklore, kampung houses, and batik into AI works exemplifies this synthesis.

Unique Contribution: While global debates on AI art often frame hybridity as posthumanist, this study foregrounds cultural hybridity as equally central. It demonstrates that AI can be a tool for cultural negotiation, not cultural erosion, especially in non-Western contexts.

**Theme 5: Authorship Dilemmas – Early Ethical Literacy**

Perhaps the most striking finding was the emergence of authorship dilemmas. Students questioned whether AI outputs were truly “their” artworks and sought ways to reclaim ownership through manual elaboration and personalisation.

This resonates with Selwyn’s (2019) discussion of AI disrupting authorship, but it is novel in showing that such reflection occurred at the primary school level. Learners reframed authorship as co-agency, a stance consistent with posthumanist creativity theories (Knox, 2020).

Importantly, this indicates the emergence of ethical literacy: students were not passive recipients but critical negotiators of originality. This aligns with UNESCO’s (2021) advocacy for embedding AI ethics in early education, and shows its feasibility in Malaysian classrooms.

Unique Contribution: This study challenges assumptions that children are too young to grasp ethical complexities of AI. Instead, it provides evidence that primary students can reflect on authorship, originality, and co-creation, suggesting that AI ethics should be introduced earlier than current policy anticipates.

Taken together, the findings advance both theoretical discourse and educational practice:

1. AI as an equaliser: It reduced skill-based barriers, democratising creative participation.
2. Child-specific vulnerabilities: Aesthetic overdependence emerged as a developmental risk.
3. Expanded teacher role: Teachers acted as mediators of process, culture, and ethics.
4. Hybrid creativity: Malaysian classrooms demonstrated unique fusions of digital, cultural, and communal practices.
5. Ethical awakening: Primary learners engaged in reflective negotiations of authorship, offering new insights into early AI ethics education.

These contributions are particularly relevant in Malaysia, where education policy is actively balancing digital innovation with cultural preservation. They also enrich international debates by foregrounding the experiences of young learners in the Global South, a perspective often underrepresented in AI and education research.

**CONCLUSION**

This study explored the integration of Leonardo AI into a Malaysian primary art classroom, investigating how generative AI influences student creativity, meaning-making, and authorship. Through analysis of field notes, reflections, interviews, and visual artefacts, five interconnected themes emerged: empowerment through visualisation, aesthetic overdependence, teacher mediation, hybrid art-making, and authorship dilemmas.

The results demonstrate that AI functioned as both an equaliser and a disruptor. On one hand, it democratised access to creativity, expanding imaginative possibilities and boosting participation among learners with weaker manual skills. On the other, it reinforced vulnerabilities, particularly aesthetic dependency and shallow conceptualisation. The mediating role of teachers proved essential in redirecting students toward meaning-making, embedding cultural values, and fostering ethical awareness. Ultimately, AI-enabled art-making in this context produced hybrid practices that blended digital, manual, cultural, and communal dimensions, while also prompting unexpected ethical reflection on authorship among young learners.

This duality illustrates the paradox of artificial intelligence (AI) in education: it generates unparalleled learning opportunities while concurrently exacerbating existing challenges. The significance of this study resides in revealing how these dynamics manifest in primary-level, non-Western classrooms in which the viewpoint often overlooked in global discussions. The findings theoretically enhance Torrance’s (1974) creativity framework by illustrating the emergence of imagination, elaboration, and originality within human–AI–cultural assemblages, thereby supporting posthumanist views on creativity (Bayne, 2018; Knox, 2020). They also contest the notion that children lack the capacity for ethical reasoning by demonstrating that authorship dilemmas and co-agency can be effectively navigated at the primary level. Furthermore, they broaden Vygotskian mediation theory by indicating that teachers serve not only as facilitators of cognitive development but also as anchors that integrate digital tools within cultural identity and ethical contemplation. The study emphasizes the importance of a balanced pedagogy wherein educators utilize strategies that merge empowerment with critical literacy. This approach ensures that while AI diminishes obstacles to creative expression, students are directed towards narrative and reflective profundity instead of merely achieving "surface beauty." It advocates for treating AI outputs as raw materials rather than final products, suggesting practices such as collage, painting, and cultural embedding as effective models. Additionally, it demonstrates how educators can facilitate ethical discussions regarding ownership, originality, and collaboration through thoughtfully crafted prompts and reflective inquiries. The study recommends that Malaysia’s Digital Education Policy should explicitly incorporate the creative and ethical aspects of AI literacy, extending beyond its current focus on functional skills. It aligns with the Malaysia Education Blueprint, which advocates for a balance between global competencies and local identity, demonstrating that culturally hybrid methods of AI integration can fulfill this objective. Furthermore, it supports UNESCO’s (2021) global recommendation to embed AI ethics in curricula by providing evidence that primary classrooms can be vital environments for fostering ethical AI literacy.

When it comes to education, generative artificial intelligence is not only about new tools; rather, it is about new ways of negotiating meaning, identity, and agency. In the hands of primary school pupils in Malaysia, Leonardo AI evolved into a tool that facilitated empowerment, hybridity, and even an awakening to ethical principles. Nevertheless, it also brought to light flaws, such as an excessive emphasis on spectacle and confusion over authorship, which necessitate careful mediation.   
Based on the findings, it appears that the future of art education does not lay in selecting between conventional and digital modes of instruction, but rather in combining the two strategies into hybrid practices that are culturally rooted and ethically conscious. When this is done, classrooms have the potential to foster not only creative abilities but also citizens who are reflective and responsible, and who are equipped for the complexity of the digital age.

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